AGENDA

CITY COUNCIL REGULAR MEETING

NOVEMBER 15, 2022 @ 6:00 PM

Notice is hereby given the City Council for the City of Parker will meet on Tuesday, November 15, 2022, at 6:00 P.M. at the Parker City Hall, 5700 E. Parker Road, Parker, Texas 75002. The City Council meeting will be open to the public and live streamed.

Pursuant to Texas Government Code § 551.127, notice is given that it is the intent of the City Council that a quorum of the Council will be physically present for the above-referenced meeting at Parker City Hall, 5700 E. Parker Road, Parker, Texas. Some council members or City employees may participate in this meeting remotely by means of video conference call in compliance with state law.

CALL TO ORDER – Roll Call and Determination of a Quorum

EXECUTIVE SESSION START TO FINISH - Pursuant to the provisions of Chapter 551, Texas Government Code the City Council may hold a closed meeting.

RECESS TO CLOSED EXECUTIVE SESSION IN ACCORDANCE WITH THE AUTHORITY CONTAINED IN:

Government Code Section 551.074 Personnel—To deliberate the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of a public officer or employee.

Government Code Section 551.071(1)—Consultation with City Attorney concerning Pending or Contemplated Litigation.

Government Code Section 551.071(2) – Consultation with Attorney on a matter in which the duty of the attorney to the governmental body under the Texas Disciplinary Rules of Professional Conduct of the State Bar of Texas clearly conflicts with this chapter (Open Meetings Act).

RECONVENE REGULAR MEETING.

ANY APPROPRIATE DELIBERATION AND/OR ACTION ON ANY OF THE EXECUTIVE SESSION SUBJECTS LISTED ABOVE.

PLEDGE OF ALLEGIANCE

AMERICAN PLEDGE: I pledge allegiance to the flag of the United States of America; and to the republic for which it stands, one nation under God, indivisible with liberty and justice for all.

TEXAS PLEDGE: Honor the Texas flag; I pledge allegiance to thee, Texas, one state under God, one and indivisible.

PUBLIC COMMENTS The City Council invites any person with business before the Council to speak to the Council. No formal action may be taken on these items at this meeting. Please keep comments to 3 minutes.

ITEMS OF COMMUNITY INTEREST

i. SPECIAL PARKS AND RECREATION COMMISSION (P&R) – WEDNESDAY, NOVEMBER 16, 2022, 5 PM

HOLIDAZE - HOLIDAY TREE LIGHTING - SUNDAY, NOVEMBER 27, 2022, 4 PM – 6 PM

CONSENT AGENDA **Routine Council business. Consent Agenda is approved by a single majority vote. Items may be removed for open discussion by a request from a Councilmember or member of staff.**

1. APPROVAL OF MEETING MINUTES FOR OCTOBER 18, 2022 [JOINT COMP PLAN WORKSHOP, 3 PM – 6 PM].
2. APPROVAL OF MEETING MINUTES FOR OCTOBER 18, 2022 [COUNCIL MEETING, 6 PM – FINISHED].
3. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-718 APPROVING THE ADOPTION OF THE COLLIN COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION ACTION PLAN.
4. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 830 APPROVING KINGS CROSSING DEVELOPMENT AGREEMENT AMENDMENT #2.

INDIVIDUAL CONSIDERATION ITEMS

5. DISCUSSION AND/OR APPROVAL OF FUNDING FOR PARKS & RECREATION HOLIDAZE LIGHTS EVENT.
6. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-719, MAKING APPOINTMENTS TO THE PLANNING AND ZONING (P&Z) COMMISSION.
7. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-720 MAKING APPOINTMENTS TO THE ZONING BOARD OF ADJUSTMENT (ZBA).
8. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-721 MAKING APPOINTMENTS TO THE TO THE PARKS AND RECREATION COMMISSION.
9. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 831 APPOINTING A DEPUTY CITY SECRETARY WITH THE POWERS AND DUTIES TO ASSIST WITH SAID OFFICE AND TO SERVE IN THE ABSENCE OF THE CITY SECRETARY.
10. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON APPOINTING A WEBSITE DEVELOPMENT SUBCOMMITTEE.
11. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ACCEPTING THE FAJITA WAGON DONATION TO PROVIDE LUNCH TO CITY STAFF FROM JOHN AND DEBBIE CHISOLM IN THE AMOUNT OF APPROXIMATELY $1,500.
12. CONSIDERATION AND/OR ANY APPROPRIATE ACTION REGARDING VEHICLE ORDERS UNDER THE ENTERPRISE CONTRACT
13. DISCUSSION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 832 AMENDING ORDINANCE NOS. 770 AND 498 REGARDING POLICE DEPARTMENT OPERATIONS AND APPOINTMENT OF A PUBLIC SAFETY COMMITTEE.

ROUTINE ITEMS

14. UPDATE(S):

ANY COMMITTEE UPDATES, AS NEEDED.

October 2022 - Building Permit/Code Report

Fire 3rd Qtr. Report 2022

October 2022 – Republic Services Inc., dba Allied Waste Services of Plan

October 2022 – Website (PIWIK) Report

ACCEPTANCE OF DONATION(S) FOR POLICE, FIRE, AND CITY STAFF FOR THE RECORD (Each valued at between $0 - $500)

Chip and Linda Justice donated two (2) dozen Tiff's Treat Cookies estimated value is $40.00.

ROUTINE ITEMS

15. FUTURE AGENDA ITEMS

ADJOURN

In addition to any specifically identified Executive Sessions, Council may convene into Executive Session at any point during the open meeting to discuss any item posted on this Agenda. The Open Meetings Act provides specific exceptions that require that a meeting be open. Should Council elect to convene into Executive Session, those exceptions will be specifically identified and announced. Any subsequent action, as a result of this Executive Session, will be taken and recorded in open session.

I certify that this Notice of Meeting was posted on or before November 11, 2022, by 5:00 p.m. at the Parker City Hall, and as a courtesy, this Agenda is also posted to the City of Parker Website at www.parkertexas.us.

The Parker City Hall is Wheelchair accessible. Sign interpretations or other special assistance for disabled attendees must be requested 48 hours in advance by contacting the City Secretary's Office at 972 442 6811.

_____ _____

Date Notice Removed

Patti Scott Grey
City Secretary

The Parker City Hall is Wheelchair accessible. Sign interpretations or other special assistance for disabled attendees must be requested 48 hours in advance by contacting the City Secretary's Office at 972 442 6811.

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey
Estimated Cost:	Date Prepared:	October 30, 2022
Exhibits:	**None**	

AGENDA SUBJECT

SPECIAL PARKS AND RECREATION COMMISSION (P&R) – WEDNESDAY, NOVEMBER 16, 2022, 5 PM

HOLIDAZE - HOLIDAY TREE LIGHTING - SUNDAY, NOVEMBER 27, 2022, 4 PM – 6 PM

SUMMARY

Please review information provided.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	City Secretary
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey
Estimated Cost:	Date Prepared:	October 23, 2022
Exhibits:	• **Proposed Minutes**	

AGENDA SUBJECT

APPROVAL OF MEETING MINUTES FOR OCTOBER 18, 2022 [JOINT COMP PLAN WORKSHOP, 3 PM – 6 PM].

SUMMARY

Please review the attached minutes. If you have any questions, comments, and/or corrections, please contact the City Secretary at PGrey@parkertexas.us prior to the City Council meeting.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

MINUTES

JOINT MEETING

CITY COUNCIL & PLANNING AND ZONING (P&Z) COMMISSION - COMPREHENSIVE PLAN WORKSHOP

OCTOBER 18, 2022

CALL TO ORDER – Roll Call and Determination of a Quorum

The Parker City Council met in a regular meeting on the above date at Parker City Hall, 5700 E. Parker Road, Parker, Texas, 75002.

Mayor Lee Pettle called the meeting to order at 3:00 p.m. Mayor Pro Tem Michael Slaughter and Councilmembers Diana M. Abraham (arrived at 4:38 p.m.), Terry Lynch, Cindy Meyer and Jim Reed were present.

Planning and Zoning (P&Z) Commission Members Present: Chair Russell Wright and Commissioners Joe Lozano, Wei Wei Jeang, and Jasmat Suturia

Staff Present: City Administrator Luke Olson, Asst. City Administrator/City Secretary Patti Scott Grey, City Attorney Trey Lansford, Public Works Director Gary Machado, Fire Chief Mike Sheff, and Police Chief Richard Brooks

PLEDGE OF ALLEGIANCE

AMERICAN PLEDGE: Russell Wright led the pledge.

TEXAS PLEDGE: Joe Lozano led the pledge.

PUBLIC COMMENTS The City Council invites any person with business before the Council to speak. No formal action may be taken on these items at this meeting. Please keep comments to 3 minutes.

None

WORKSHOP

COMPREHENSIVE PLAN

Mayor Pro Tem / Comprehensive Plan (COMP Plan) Committee Chair Slaughter reviewed the information provided in tonight's packet, giving an overview of the City's Comprehensive (COMP) Plans from 1987 to the present. Mr. Slaughter noted with recent zoning code and annexation, zoning and thoroughfare map updates, the City has information to move forward with the COMP Plan. Councilmember Meyer presented a Comprehensive Plan Contents of Similar Collin County Cities spreadsheet, comparing and assessing eight (8) small cities' COMP Plan. [**See Exhibit 1** – *Councilmember Meyer's Comprehensive Plan Contents of Similar Collin County Cities spreadsheet, dated October 18, 2022.*]

After some discussion, the group decided to use components of a couple cities to form the City's COMP Plan and started brainstorming words for a vision statement. [**See Exhibit 2** *– P &Z Chair Wright's list of key vision statement words from the group, dated October 18, 2022.*] These words are to be used for possibly developing a vision statement. The group was tasked with bringing draft vision statements, using these keywords;

PROPOSED

developing questions to be included in a survey required for the COMP Plan; and lastly their thoughts on how to survey our residents to gather responses.

The group scheduled their next meeting for Tuesday, October 25, 2022, 4:00 p.m. to 6:00 p.m. in the Fire Department Training Room, due to November 8, 2022 Election Early Voting schedule.

Mayor Pettle encouraged all residents to attend.

ADJOURN

Mayor Lee Pettle adjourned the meeting at 5:41 p.m.

APPROVED:

_____
Mayor Lee Pettle

ATTESTED:

Approved on the ___15th__ day of _____November____, 2022.

_____
Patti Scott Grey, City Secretary

PROPOSED

Comprehensive Plan Contents of Similar Collin County Cities

City of Lucas (2017) Population 8,029	City of Murphy (2008) Population 21,219	City of Lavon (2019) Population 5,342	City of Farmersville (2013*) Population 3,808	City of Josephine Population 2,381	City of Fairview - 2005 (AMND 2014) Population 10,683	City of Princeton 2019 (Type A Gen Law) Population 21,000	City of Celina - 2021 Plan Population 18,881
Cover Page	**Cover Page**	**Cover Pages**	**Cover Page**	Could only locate 1 map and zoning ordinances	**Acknowledgements**	**Acknowledgements**	**Acknowledgements**
Pg 2 - single photo	**Acknowledgements**	**Table of Contents**	**Table of Contents**		**Table of Contents**	**Table of Contents**	**Chapter 1 - Introduction**
Page 3 - Table of Contents	**Table of Contents**	**Letter from the Mayor**	**Cover Page**		Introduction	Introduction	Letter from the Mayor
Chapter 1 - Intro	**Chapter 1: Snapshot**	Introduction - Planning Area (map)	**Acknowledgements**		Goals and Objectives	Growth Trends	Pupose of Celina 2040
Purpose	Introduction	Introduction - People of Lavon	City Council		Future Land Use Plan	Plan Summary	Celina Planning Area
Location	Existing Social and Economic Characteristics	**Survey Snopshot (477 residents)**	P&Z		Transportation Plan	**Public Involvement**	How the Plan is Stuctured
Chapter 2 - Population	Existing Land Use Characteristics	Key Takeaways	Economic Development Corp		Parks & Recreation Plan	Introduction	History of Celina
Population Trends	Local Development Patterns	Top 10 Feedback Themes	Communicty Development Corp		**Appendix**	Comprehensive Plan Advisory Committee	**Chapter 2 - Plan Framework**
Population Projections	**Chapter 2: Visioning**	**Envision Lavon Public Forum**	City Staff		Public Involvement	Community Charrette	Community Engagement
Chapter 3 - Housing	Purpose	Summary of Comments/insights gained	Consultants		History	Stakeholder Interviews	Building on the Past Planning Effort
Introduction	Visual Character Survey	**Strategic Plan**	Photos		Existing Conditions	Stakeholders	Vision Statement
Existing Housing Analysis	Questionnaire	"Our Why", Core Purpose, Core Values	**Introduction**		Alternative Scenario Discussions	Mayor's Yoouth Council	Guiding Principles
Housing Goals and Objectives	SWOT Analysis	Vision Framework	**Chapter 1: The Farmersville Vision**		Town Design	Work Session	**Chapter 3 - Triple Bottom Line**
Future Housing Requirements	**Chapter 3: Future Land Use Plan**	Two-Year Goals (total of 10) summarized	**Chapter 2 : Farmersville's Demographic Trends**		Implementation	Community Easter Egg Hunt	Equity
Housing Actions	Introduction	**Natural Systems and Drainage**	**Chapter 3: Land Use**		Definitions	Onion Festival	Economic & Fiscal Vitality
Chapter 4 - Land Use	Goals and Objectives	**Existing Land Use**	**Chapter 4: Transportation**		Addendum	Community Open House	Green Celina
Introduction	Population projection & capacity	**Existing Zoning**	**Chapter 5: Utilities and Public Facilities**			July Spectacular	**Chapter 4 - Character and Placemaking**
Analysis of Existing Land Use	Recommended Pattern of Land Use	**Future Land Use**	**Chapter 6: Parks and Open Space**			Online Survey	Design
Socio-Economic and Man-Made Influences	General Recommendations	**Land Use & Urban Design**	**Chapter 7: Strategic Implementation Plan**			Social Media and Website	Character Framework
Other Services	Housing & Neigjhborhood Recommendations	**Mobility Framework**				**Vision Statement and Guiding Principles**	Housing & Neighborhoods
ETJ and Future Annexations	Livability Recommendations	**Mobility & Connectivity**				Introduction	Parks & Recreation
Zoning & Subdivision Regulations	**Chapter 4: Thoroughfare Plan**	**City Services & Facilities**	*** Updated 2017 (390 pages)**			Vision Statement	**Chapter 5 - Strategic Growth**
Land Use Goals and Objectives	Introduction	**Economics & Market**	**(projected pop in 2017-- 4,400)**			Guiding Principles	Planning Area & population
Local Goals and Objectives Affecting Development	Goals & Objectives	**Key Priorities**	Intro			Branding	Utilities & Services
Future Land Use	Functional Classification Systems & Related levels of service		Population Analysis			**Land Use**	Mobility & Connectivity
Recommended Assignments of Land Use	Regional and Local Mobility & Access		Housing Study			Introduction	**Chapter 6 - Implementation & Monitoring**
Recommended Land Use Plan	Thoroughfare Policy Recommendations		Land Use Study			Existing Land Use Pattern	Introduction
Chapter 5 - Economic Development	**Chapter 5: Economic Development Strategies**		Water Supply & Distribution Study			Growth Trends	Partnerships & Funding
Introduction	Introduction		Wastewater Collection/Treatment Study			Place Types	Monitoring Progress
Development Characteristics & Policies	Goals and Objectives		Street System Study			Future Land Use Plan	Updates & Amendments
Economic Development Plan	Primary Organizations Supporting Econmic Development		Thoroughfares Study			**Development, Infrastructure, Public Services**	Key Takeaways and Highlights
Housing Supply	Economic Development Policy Recommendations		Economic Development Study			**Introduction**	Action Plan Matrix
Attracting New Businesses	**Chapter 6: Community Facilities Plan**		Recreation & Open Space Study			**Public Facilities**	
Economic Development Goals & Objectives	Introduction		Central Business District Study			**Municipal Buildings**	
Chapter 6 - Parks, Rec, open spaces	Goals and Objectives		Capital Improvement Program			**Schools**	
Chapter 7 - Streets and drainage	City Services & Facilities		Strategic Implementation Plan			**Libraries**	
Streets	Community Facilities policy recommendations		Funding sources			**Parks**	
Drainage	**Chapter 7: Implementation Strategies**		Zoning Ordinance			Park Plan	
Street System Analysis	Introduction		Subdivision Ordinance			**Public Services**	
Street Configuration Classification	General use of the Plan					Police and Fire Services .	
Street System Evaluation	Specific Implementation Strategies/Priorities		2 Pages just to list "List of Tables"			Water and Wastewater Services	
Existing Street Conditions	**Appendix A: Murphy Parks, Recreation & Open Space Master Plan**		1 Page to list "List of Charts"			Emergency Warning System .	
Types of Street Improvements			1-1/2 Pages to list "List of Figures"			**Economic Development**	
Drainage System Analysis						(skipped the list)	
General Drainage Problems						**Mobility**	
Plan & Recommendations						Introduction .	
Financial Sources for Improvements						Thoroughfare Plan Update	
Chapter 8 - Water system						Multimodal Thoroughfare Cross Section Alternatives	
Introduction						On-Street Bicycle Framework Plan .	
Existing Water System						Pedestrian Improvements .	
Parameters for Future Facilities						**Strategic Investment Areas**	
Proposed Water System						(skipped list)	
Appendix - Maps						**Implementation**	
Wastewater System						Introduction	
Water System						Strategies, Tools, and Partnerships	
Thoroughfare Plan						Implementation Matrix	
Land Use Map						**Appendices**	
Trails Master Plan						(Skipped list)	
						Figures	

Exhibit 2

From: Russell Wright
To: Patti Grey
Subject: Vision statement keywords
Date: Tuesday, October 18, 2022 5:20:23 PM

My notes:

Vision statement
The City of Parker is a unique, high quality community in a country setting dedicated to ensuring the quality of life by delivering cost effective highly responsive services with integrity and friendliness while protecting the health, safety, and welfare of our citizens and employees.

Large lots, open spaces, country setting, friendly, country life, community, quality of life, limited commercial, freedom, animal friendly, family friendly, family oriented, best place to live, people, unique, custom living, estate lots, low taxes, oasis, quality service, quality of life, kid friendly, access to schools, easy access to services, low crime, outdoors, nature, natural, outdoor living, elbow room, planned separation, privacy, room to breathe, cooler temps, wildlife, diversity, diverse, low density, limited commercial, residential communities, treasured by citizens, preserving natural assets, shared values, tees, environmental harmony, nature

Fairview has a good vision statement

Regards

Russ

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	City Secretary
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey
Estimated Cost:	Date Prepared:	October 30, 2022
Exhibits:	• **Proposed Minutes**	

AGENDA SUBJECT

APPROVAL OF MEETING MINUTES FOR OCTOBER 18, 2022 [COUNCIL MEETING, 6 PM – FINISHED].

SUMMARY

Please review the attached minutes. If you have any questions, comments, and/or corrections, please contact the City Secretary at PGrey@parkertexas.us prior to the City Council meeting.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

MINUTES

CITY COUNCIL MEETING

OCTOBER 18, 2022

CALL TO ORDER – Roll Call and Determination of a Quorum

The Parker City Council met in a regular meeting on the above date at Parker City Hall, 5700 E. Parker Road, Parker, Texas, 75002.

Mayor Lee Pettle called the meeting to order at 6:00 p.m. Mayor Pro Tem Michael Slaughter and Councilmembers Diana M. Abraham, Terry Lynch, Cindy Meyer and Jim Reed were present.

Staff Present: City Administrator Luke Olson, Asst. City Administrator/City Secretary Patti Scott Grey, Finance/Human Resources Director Grant Savage, City Attorney Trey Lansford, Public Works Director Gary Machado, Fire Chief Mike Sheff, and Police Chief Richard Brooks

EXECUTIVE SESSION - Pursuant to the provisions of Chapter 551, Texas Government Code, Vernon's Texas Codes Annotated the City Council may hold a closed meeting.

RECESS TO CLOSED EXECUTIVE SESSION IN ACCORDANCE WITH THE AUTHORITY CONTAINED IN:

Government Code Section 551.074 Personnel—To deliberate the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of a public officer or employee.
Government Code Section 551.071(1)—Consultation with City Attorney concerning Pending or Contemplated Litigation.
Government Code Section 551.071(2) – Consultation with Attorney on a matter in which the duty of the attorney to the governmental body under the Texas Disciplinary Rules of Professional Conduct of the State Bar of Texas clearly conflicts with this chapter (Open Meetings Act).

Mayor Lee Pettle recessed the regular meeting to Executive Session at 6:01 p.m.

RECONVENE REGULAR MEETING.

Mayor Lee Pettle reconvened the meeting at 7:26 p.m.

ANY APPROPRIATE DELIBERATION AND/OR ACTION ON ANY OF THE EXECUTIVE SESSION SUBJECTS LISTED ABOVE.

No action was taken.

PLEDGE OF ALLEGIANCE

AMERICAN PLEDGE: Ed Standridge led the pledge.

TEXAS PLEDGE: Sally Binnix led the pledge.

PUBLIC COMMENTS The City Council invites any person with business before the Council to speak. No formal action may be taken on these items at this meeting. Please keep comments to 3 minutes.

PROPOSED

Ed Standridge, 3607 Hogge Drive, spoke in regard to his concerns that "a few citizens in Parker seem to enjoy holding Parker back and gain attention being negative." (**See Exhibit 1** – Ed Standridge's email, dated October 18, 2022.)

Sally Binnix, 6305 Northridge Parkway, said she is Southridge Homeowners' (HOA) president and spoke in regard to their subdivision's concerns over the lack of traffic control at Dillehay and Ravensthorpe as the realignment of the roads is completed. It is a road hazard. The residents of Southridge would like to work with the City to find solutions.

ITEMS OF COMMUNITY INTEREST

Mayor Pettle reviewed the following:

REMINDER – HOME HAZARDOUS WASTE - http://www.parkertexas.us/416/Home-Hazardous-Waste

NATIONAL PRESCRIPTION DRUG TAKE BACK EVENT SATURDAY, OCTOBER 29, 2022, 10 AM – 2 PM

PARKERFEST - SUNDAY, OCTOBER 30, 2022, 3 PM to 6 PM

EARLY VOTING: MONDAY, OCTOBER 24, 2022 - FRIDAY, NOVEMBER 4, 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
October 23	**October 24** **Early Voting** **8am–5pm**	**October 25** **Early Voting** **8am–5pm**	**October 26** **Early Voting** **8am–5pm**	**October 27** **Early Voting** **8am–5pm**	**October 28** **Early Voting** **8am–5pm**	**October 29** **Early Voting** **7am–7pm**
October 30 **Early Voting** **11am–5pm**	**October 31** **Early Voting** **7am–7pm**	**November 1** **Early Voting** **7am–7pm**	**November 2** **Early Voting** **7am–7pm**	**November 3** **Early Voting** **7am–7pm**	**November 4** **Early Voting** **7am–7pm**	**November 5**
November 6	**November 7**	**November 8** **Election Day** **7am-7pm**				

CITY COUNCIL (CC) – TUESDAY, NOVEMBER 1, 2022, 7 PM – CANCELED – DUE TO NOVEMBER 8, 2022 GENERAL ELECTION EARLY VOTING

PARKS AND RECREATION COMMISSION (P&R) – WEDNESDAY, NOVEMBER 9, 2022, 4 PM

HOLIDAZE - HOLIDAY TREE LIGHTING - SUNDAY, NOVEMBER 27, 2022, 4 PM – 6 PM

CONSENT AGENDA Routine Council business. Consent Agenda is approved by a single majority vote. Items may be removed for open discussion by a request from a Councilmember or member of staff.

1. APPROVAL OF MEETING MINUTES FOR SEPTEMBER 20, 2022.
2. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-715 FINDING THAT ONCOR ELECTRIC DELIVERY COMPANY LLC'S ("ONCOR" OR COMPANY") APPLICATION TO CHANGE RATES WITHIN THE CITY SHOULD BE DENIED; FINDING THAT THE CITY'S REASONABLE RATE CASE EXPENSES SHALL BE REIMBURSED BY THE COMPANY; FINDING THAT THE MEETING AT WHICH THIS RESOLUTION IS PASSED IS OPEN TO THE PUBLIC AS REQUIRED BY LAW; REQUIRING NOTICE TO THE COMPANY AND LEGAL COUNSEL.
3. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-716 AUTHORIZING THE MAYOR TO EXECUTE A 2023

PROPOSED

MEMBERSHIP APPLICATION AND AGREEMENT BETWEEN THE CITY OF PARKER AND THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.

4. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-717 REGARDING THE SUSPENSION OF SELECT PARK RULES PURSUANT TO PARKER CODE OF ORDINANCE SECTION 97.11 FOR PARKERFEST 2022 ON SUNDAY, OCTOBER 30, 2022 FROM 1:00 P.M. TO 7:00 P.M. UPON SATISFYING CERTAIN CONDITIONS.

   MOTION: Councilmember Abraham moved to approve consent agenda items 1 through 4 as presented. Mayor Pro Tem Slaughter seconded with Councilmembers Abraham, Lynch, Meyer, Reed, and Slaughter voting for the motion. Motion carried 5-0.

INDIVIDUAL CONSIDERATION ITEMS

5. CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-706 APPROVING THE CAPITAL ASSET POLICY. [POSTPONED – 07192022]

   MOTION: Mayor Pro Tem Slaughter moved to approve Resolution No. 2022-706 - Capital Asset Policy, as amended, adding “resolution” to page 1, section 1.03. Councilmember Abraham seconded with Councilmembers Abraham, Lynch, Meyer, Reed, and Slaughter voting for the motion. Motion carried 5-0.

ROUTINE ITEMS

6. UPDATE(S):

   CITY ADMINISTRATOR OLSON UPDATE ON FM2551

   City Administrator Olson reported the TxDot Project has stalled. Staff has seen no work or received any information from TxDot. It appears North Texas Municipal Water District (NTMWD) is doing some work to move ahead.

   ENTERPRISE FLEET MANAGEMENT UPDATE

   City Administrator Olson said he is discussing the issues with Enterprise. Supply and billing issues are being corrected. Mr. Olson plans to update Council as he is made aware. He noted his concern with the high cost of vehicles.

   ANY COMMITTEE UPDATES, AS NEEDED.

   MONTHLY/QUARTERLY REPORTS

   September 202 - Building Permit/Code Report

   September 2022 – Court Report

   September 2022 – Finance (monthly financials) Report

   Investment 3rd Qtr. Report 2022

   September 2022 – Police Report

   September 2022 – Republic Services Inc., dba Allied Waste Services of Plan

   September 2022 – Website (PIWIK) Report

   The reports were accepted.

PROPOSED

ACCEPTANCE OF DONATION(S) FOR POLICE, FIRE, AND CITY STAFF FOR THE RECORD (Each valued at between $0 - $500)

AJ Siebert of VC3 Inc. Cyber Security donated one half dozen cookies from Tiff's Treats valued at $10.00.

Paul Lopez & the ARBH Tax Section donated one dozen cookies from Tiff's Treats valued at $20.00.

Sudheir Sakaria donated snacks valued at $40.00.

Dublin Road Estates donated $245 to Parker Police and $245 to Parker Fire Departments via Charles C. and Kristl A. Pearl.

Phil & JoAnn DeNitto donated $100 to Parker Police and $100 to Parker Fire Departments.

Maryam Boroujerdi donated one dozen Bundt cakes valued at $23.00.

Nina Cook of Houston, TX donated chips valued at $20.00.

The Regh Family donated Nothing Bundt Bundtinis value $25.00.

First United Bank of Durant, OK donated $500 to Parkerfest.

Mayor Pettle, on behalf of herself, City Council, and City Staff, thanked the donors above for their kind and generous donations.

FUTURE AGENDA ITEMS

7. FUTURE AGENDA ITEMS

The Mayor made note of several topics, e.g., water rate, facility, Capital Improvements (CIP), animal control fees, Dublin Road, fences, Council needs to discuss. She asked Council to check their availability and to be prepared when Staffs prompts us.

Hearing no additional requests, Mayor Pettle encouraged everyone to email her requests. She noted the next regularly scheduled meeting, November 1, 2022 is canceled due to early voting. The next regularly scheduled meeting is November 15, 2022.

WORKSHOP

8. COUNCIL TERM LENGTH

City Attorney Lansford reviewed his PowerPoint, noting he prepared the information, as some residents and Councilmembers indicated they wanted information about possibly increasing the length of terms for Mayor and Council. The current two (2) year terms can be too short to accomplish their goals and complete projects. Others are tired of annual elections, and this could give Council and Staff a year off. There could possibly be an election cost savings. An increase in term length would require an election for vacancies and could not be filled by appointment.

Council requested this be placed on an agenda for Council to decide whether or not to place it on the May 2023 ballot. The residents would vote on whether to increase term lengths or not.

PROPOSED

ADJOURN

Mayor Lee Pettle adjourned the meeting at 8:21 p.m.

APPROVED:

Mayor Lee Pettle

ATTESTED:

Approved on the 15th day of November, 2022.

Patti Scott Grey, City Secretary

PROPOSED

Exhibit 1

I have been Parker resident since 1999, I have served on numerous committees' and on the city council. I am proud to be a Parker resident!

What I want to talk about is my concern that we have a few citizens in Parker that seem to enjoy holding Parker back and gain attention being negative. When I moved to Parker, we were a progressive thriving community, the envy of DFW and touted to be the #1 community in DFW. We had pride in our "Uniquely Country" community. However, over the years we have become a small town with a stale attitude encouraged by a few who oppose any change. What happened to the pride of yesteryear?

If you read the paper or watch the news, many small towns much like Parker are progressing.

- Princeton has a newly completed municipal building;
- Celina with growth and country charm;
- Aubrey with its small-town atmosphere;

And the list goes on as identified in the Dallas Morning news, except for Parker. We have let our town fall behind.

Over the past years efforts have been made to pass a municipal building bond, where the employees of Parker have sufficient work space and at the same time reflects pride and professionalism in our community and DFW.

If we had positive support from Parker residents 5+ years ago today, we would be meeting in an attractive complex that would support our city requirements and reflect a progressive community. Instead, we endure over crowed space for our city employees and a deteriorating portable building for our Police Department. Which I might add that we pay a monthly lease that results in lost dollars for the city.

Today, because the cost of material and labor to build a complex even smaller than we have discussed, would be in excess of 30% greater.

Some citizens have asked why we are not moving forward as the decision is the responsibility of the council. However, to move forward, a positive vote on a bond from Parker citizens is necessary.

A further example of our decline is with the recent budget. The vote for a tax reduction was approved . . . but why? We have streets and infostructure that need major repair. But more important is how we are treating our city employees compared to other local municipalities. Are they being rewarded for their contributions? Think of February with the freeze and the city workers were out in force away from their families working to support us the citizens, they each take pride in being there to assist you. And the list goes on. . .

So where do we go from here?

I for one have pride in Parker and all employees of Parker and will continue to support all city employees, Police and Fire, and the need for a new municipal complex. We need to regain the pride in our community and make Parker once again a growing jewel in DFW.

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Fire Department/ Chief Sheff
Fund Balance-before expenditure:	Prepared by:	Sheff
Estimated Cost:	Date Prepared:	November 3, 2022
Exhibits:	1. Proposed Resolution (by The Collin County Commissioners Court) 2. Collin County Hazard Mitigation Plan 3. FEMA approval letter pending adoption of the Plan	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-718 APPROVING THE ADOPTION OF THE COLLIN COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION ACTION PLAN.

SUMMARY

On June 6, 2022, The Collin County Commissioners Court approved the adoption of the Collin County Hazard Mitigation Action Plan ("Plan"). The planning area includes, among other jurisdictions, the City of Parker.
Approval and adoption of the Plan by the City of Parker is in the best interests of the City and its citizens.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Mike Sheff	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

RESOLUTION NO. 2022-718
(Adoption of Collin County Hazard Mitigation Action Plan)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, ADOPTING THE 2022 COLLIN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION ACTION PLAN; PROVIDING A REPLEALING CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, The City Council of the City of Parker along with the Collin County Commissioners Court recognizes the threat that natural hazards pose to people and property within the City of Parker and the whole of Collin County; and

WHEREAS, the City of Parker has participated with Collin County to prepare a multi-jurisdictional hazard mitigation plan, hereby known as the Collin County Hazard Mitigation Action Plan; and

WHEREAS, the City of Parker and Collin County previously adopted a Hazard Mitigation Action Plan dated September 2016; and

WHEREAS, the parties have updated and revised the Hazard Mitigation Action Plan; and

WHEREAS, the 2022 Collin County Hazard Mitigation Action Plan, attached hereto as Exhibit A, identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Collin County form the impacts of future hazards and disasters; and

WHEREAS, the Federal Emergency Management Agency has conducted a review of the 2022 Collin County Hazard Mitigation Action Plan and found it approvable pending adoption by the applicable local governmental agencies; and

WHEREAS, on June 6, 2022, through Court Order 2022-519-06-06, the Collin County Commissioners Court approved adoption of the 2022 Collin County Hazard Mitigation Action Plan, and Collin County has requested the City of Parker to adopt it as well for final FEMA approval; and

WHEREAS, adoption by the City Council of the City of Parker demonstrates their commitment to hazard mitigation and achieving the goals outlined in the 2022 Collin County Hazard Mitigation Action Plan; and

WHEREAS, the City Council deems it in the public interest to approve the adoption of the 2022 Collin County Hazard Mitigation Action Plan;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS:

Section 1. The findings set forth in the preamble of this Resolution are incorporated by reference into the body of this Resolution as if fully set forth herein.

Section 2. The City Council of the City of Parker does hereby adopt the 2022 Collin County Hazard Mitigation Action Plan, as attached hereto as Exhibit A.

Proposed

Section 3. All provisions of the resolutions of the City of Parker, Texas, in conflict with the provisions of this resolution, including Resolution 2019-600 which adopted the September 2016 Hazard Mitigation Action Plan, be, and the same are hereby, repealed, and all other provisions not in conflict with the provisions of this resolution shall remain in full force and effect.

Section 4. This Resolution shall be effective upon passage and approval.

DULY RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS, THIS 15TH DAY OF NOVEMBER, 2022.

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

State of Texas	**§**	**Court Order**
Collin County	**§**	**2022-519-06-06**
Commissioners Court	**§**	

An order of the Collin County Commissioners Court approving the adoption of the Hazard Mitigation Action Plan.

The Collin County Commissioners Court hereby approves the adoption of the Collin County Hazard Mitigation Action Plan, as detailed in the attached documentation.

A motion was made, seconded, and carried by a majority of the court members in attendance during a regular session on Monday, June 6, 2022.

Chris Hill, County Judge

Darrell Hale, Commissioner, Pct 3

Susan Fletcher, Commissioner, Pct 1

Duncan Webb, Commissioner, Pct 4

Cheryl Williams, Commissioner, Pct 2

ATTEST: Stacey Kemp, County Clerk

Hazard Mitigation Action Plan

June 6, 2022

Collin County, Texas



Executive Summary

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials, and other community stakeholders.

The planning area for this plan update is for Collin County, Texas and includes the following jurisdictions:

A. Collin County (unincorporated)
B. City of Allen
C. City of Anna
D. City of Blue Ridge
E. City of Celina
F. Town of Fairview
G. City of Farmersville
H. City of Frisco
I. City of Josephine
J. City of Lavon
K. City of Lowry Crossing
L. City of Lucas
M. City of Melissa
N. City of Murphy
O. Town of New Hope
P. City of Parker
Q. City of Princeton
R. Town of Prosper
S. Town of St. Paul
T. City of Wylie

The contents of this plan update are designed and organized to be as reader-friendly and functional as possible. The structure and format of this plan has not significantly changed from the Mitigation Plan that was adopted in 2016.

As this plan is an update to previous plans updates to developments and evolutions to the hazard mitigation strategy of Collin County have been included. Each jurisdiction's individual mitigation strategy is discussed in their annex. Jurisdictions that participated in the 2016 HazMAP have changes in development highlighted in their individual annex.

As the growth of Collin County has expanded since the previous version of the plan; however, no new hazards have been included. The vulnerability analysis has changed and these updates have been included.

Discussion of all hazards can be found in chapter 3.

The objectives of this updated plan remain the same as in the previous plans. These include:

- To save lives and reduce injuries.
- Minimize damage to buildings and infrastructure (especially critical facilities).
- Minimize economic losses

Further examination of the action items from the 2016 plan, including the status of each action item, can be found in Chapter 4 of the main plan. New action items for each jurisdiction are located in the jurisdictional annexes.

During the development phase of this updated planning document, the review team noted some changes. While the scope and intent of the 2011 priorities remain the same, some of the underlying factors driving the priorities reflect new external trends, such as public perceptions and expectations, or are indicative of new awareness and approaches to community mitigation strategies.

Areas of 2016 Priories

- Post disaster conditions
  - With the potential for significant reimbursement for post-disaster projects through FEMA grants, it was prudent the plan be updated.
- Financial, legal and political realities
  - The Collin County Hazard Mitigation Action Plan (HazMAP) was updated to new standards utilizing a HMA grant and the North Central Texas Council of Governments (NCTCOG). This provided the necessary financial assistance and personnel to help organize the jurisdictions of Collin County, as well as compile the data into a cohesive plan.
  - Due to a HMA grant funding the NCT Safe Room Rebate Program, there was initial concern that only jurisdictions that were part of the county plan or had their own HazMAP would be eligible. As a result, most of the Collin County jurisdictions opted to participate in the Collin County HazMAP.
- Changes in hazard focus
  - Collin County has not changed the overall focus on hazards but has updated the likelihood of an occurrence based on new data from past meteorological and archival data. With these updates, the data has shown we are more likely to experience certain disasters over others. Through the use of the Priority Risk Index, persons interested in the plan will be able to better understand the rank of disasters and why one disaster may be considered at a higher risk than others. In addition, expansive soils and lightning were included as potential hazards. These hazards were not included in the 2011 plan.

Areas of 2021 Priority Refinement:

- The Plan was updated based on the current standards, which were the same standards during the 2016 update
- The Plan was updated without contractor help and with local jurisdictions updating their areas of responsibility accordingly
- The Plan was simplified in regards to maps. Unless a map was needed for a specific jurisdiction, Countywide maps were used for the 2021 update.

The 2021 Planning Team acknowledges this mitigation plan is a planning document, not a regulatory document. The plan meets Federal Emergency Management Agency (FEMA) planning requirements by addressing hazards, vulnerability and risk.

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Chapter One: Introduction

1.1 Purpose

Collin County is susceptible to a number of different natural hazards that have potential to cause property damage or loss, loss of life, economic hardship, and threats to public health and safety. Occurrence of natural disasters cannot be prevented; however, their impact on people and property can be lessened through hazard mitigation measures.

The Collin County Hazard Mitigation Action Plan has been developed by the Collin County Hazard Mitigation Planning Team (HMPT). The plan represents collective efforts of citizens, elected and appointed government officials, business leaders, non-profit organizations, and other stakeholders.

Through the development of this plan, the Planning Team identified the natural hazards that could affect Collin County, and evaluated the risks associated with these hazards. The implementation of this plan will make Collin County more disaster- resilient because the benefits that can be gained by planning ahead and taking measures to reduce damages before the next disaster strikes have been recognized. The plan will allow Collin County and participating jurisdictions to comply with the Disaster Mitigation Act of 2000 (DMA 2000) and it's implementing regulations 44 CFR Part 201.6, thus resulting in eligibility to apply for federal aid for technical assistance and post-disaster hazard mitigation project funding.

1.2 Collin County Hazard Mitigation Action Plan Planning Process

The Collin County Hazard Mitigation Action Plan (HazMAP) was created in order to meet current federal and state hazard mitigation plan regulations in compliance with the following rules and regulations:

> Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)
>
> Federal Emergency Management Administration's Interim Final Rule, published in the Federal Register on February 26, 2002, at 44 CFR Part 201.

Each jurisdiction participated by having a Hazard Mitigation Planning Committee (HMPC). Each HMPC participated in the creation of and contributed to the Hazard Mitigation Action Plan. The North Central Texas Council of Governments (NCTCOG) Emergency Preparedness Department also participated in the HazMAP update341. NCTCOG's role was to assist in compiling the jurisdictional information and preparing the plan for submission. Collin County hazard mitigation planning meetings were held on August 12, 2020, November 2, 2020, November 5, 2020, November 12, 220, and June 10, 2021.

1.3 HazMAP Planning Process Point of Contact and Demographics

The following were the points of contacts during the HazMAP planning process for 2020:

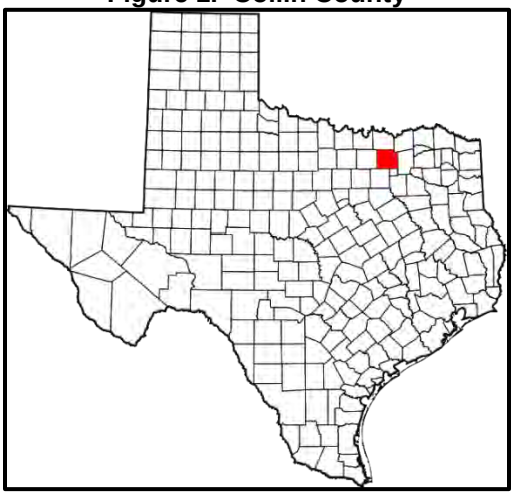
Jurisdiction	Agency	Title	Jurisdiction	Agency	Title
Collin County	Emergency Management	Assistant EMC	Lowry Crossing	Administration	City Secretary
Collin County	Emergency Management	Assistant EMC	Lucas	Fire Dept.	EMC/Asst. Fire Chief
Allen	Fire Department	Division Chief	Melissa	Fire Dept.	Fire Chief
Anna	Fire Dept.	Fire Chief	Melissa	Fire Department	Admin. Assistant
Anna	Fire Department	Bat. Chief	Murphy	Fire Dept.	Fire Chief
Blue Ridge	Public Works	City Secretary	Murphy	Fire Dept.	Fire Marshal
Celina	Fire Dept.	Assistant Chief	New Hope	City Admin.	Town Secretary
Fairview	City Management	Asst. to City Manger	New Hope	City Council	Alderman
Farmersville	Fire Dept.	Police Chief	Parker	Fire Dept.	Fire Lieutenant
Frisco	Fire Dept.	Deputy EMC	Parker	Police Dept.	Police Chief
Frisco	Fire Dept	EM Analysis	Princeton	Administration	EMC/Fire Lt.
Josephine	Fire Dept.	Police Chief	Prosper	Fire Dept.	EMC
Lavon	Fire Department	Fire Chief	St. Paul	City Council	Town Secretary
Lavon	City Management	City Administrator	Wylie	Fire Dept.	EMC

Jurisdiction	2014 Population	2019 Population
Collin County	**846,850**	**1,034,730**
Allen	90,030	105,823
Anna	10,250	15,778
Blue Ridge	822	1,023
Celina	6,660	27,607
Fairview	8,310	12,738
Farmersville	3,292	3,351
Frisco	137,310	200,490
Josephine	811	1,966

Jurisdiction	2014 Population	2019 Population
Lavon	2,740	4,210
Lowry Crossing	1,710	1,756
Lucas	5,970	8,553
Melissa	6,190	12,381
Murphy	18,020	20,500
New Hope	614	705
Parker	4,110	5,177
Princeton	7,840	15,330
Prosper	14,710	28,830
St. Paul	1,070	1,090
Wylie	44,280	53,067

Source: 2020 NCTCOG Population Estimates, United States Census Bureau & Texas Association of Counties

Figure 1. Collin County



Source: Texas National Resource Inventory

1.4 Collin County Hazard Mitigation Action Plan Organization

The Collin County Hazard Mitigation Action Plan is organized into five chapters which satisfy the mitigation requirements in 44 CFR Part 201, with an appendix providing the required supporting documentation.

Chapter One: Introduction

Describes the purpose of the Collin County Hazard Mitigation Action Plan and introduces the mitigation planning process.

Chapter Two: Planning Process

Describes the planning process and organization for each participating jurisdiction, satisfying requirements 201.6(c)(1), 201.6(b)(2), 201.6(b)(1), 201.6(b)(3), 201.6(c)(4)(iii), 201.6(c)(4)(i).

Chapter Three: Hazard Identification and Risk Assessment

Describes the hazards identified, known national extent scales, location of hazards, previous events, and jurisdictional profiles, satisfying requirements 201.6(c)(2)(i), 201.6(c)(2)(ii).

Chapter Four: Previous Action Items

Examines the ability of Collin County and participating jurisdictions to implement and manage a comprehensive mitigation strategy. The past action items are listed with their current status of deferred, in progress, completed or deleted.

Chapter Five: Plan Maintenance

Describes the monitoring, evaluating, updating, plan incorporation, and future public updates for each participating jurisdiction, satisfying requirements 201.6(c)(4)(i), 201.6(c)(4)(ii), 201.6(c)(4)(iii).

Chapter Six: Individual Jurisdictional Annexes

Each participating jurisdiction has written a personalized annex detailing their planning process, hazard analysis, capabilities, mitigation strategies and action items, and maintenance plan.

Appendix A: Documentation from Planning and Public Meetings

1.5 Collin County Hazard Mitigation Strategy Maintenance Process

The Collin County Hazard Mitigation Action Planning Team will continue to collaborate as a planning group and in in coordination with other surrounding jurisdictions and the North Central Texas Council of Governments (NCTCOG) Emergency Preparedness Department as needed. Primary Contact will be through emails and conference calls with strategy meetings to occur at least annually. Collin County will lead the plan maintenance and update processes by:

- Assisting jurisdictional Hazard Mitigation Planning Teams in updating their individual contributions to the County HazMAP
- Assisting interested jurisdictions in the County who would like to begin their mitigation planning process
- Facilitating Collin County HazMAP meetings and disseminating information
- Corroborating data for the county-wide sections

- Requesting updates and status-reports on planning mechanisms
- Requesting updates and status reports on mitigation action projects
- Assisting jurisdictions in mitigation grants
- Assisting jurisdictions in implementing mitigation goals and action projects
- Providing mitigation training opportunities
- Maintaining documentation of local adoption resolutions for the County Hazard Mitigation Action Plan

1.6 Collin County Hazard Mitigation Action Plan Adoption

Once the Collin County Hazard Mitigation Action Plan has received FEMA “Approved Pending Local Adoption” each participating jurisdiction will take the Collin County HazMAP to their Commissioner’s Courts or City Councils for final public comment and local adoption. A copy of the resolution will be inserted into the Collin County HazMAP and held on file at the North Central Texas Council of Governments.

Chapter Two: Planning Process

(In compliance with 201.6(c)(1))



Chapter Two of the Collin County Hazard Mitigation Action Plan (HazMAP) describes the comprehensive planning and open public process utilized by the participating jurisdictions within Collin County during the plan development and through to plan completion. Each of the jurisdictions involved developed an integrated approach specific to their jurisdiction that provided for not only hazard mitigation teams and management input, but also an opportunity for the public to comment on the plan. This information is included in each individual jurisdictional annex. The development of the Hazard Mitigation Action Plan was orchestrated to provide an opportunity for all stakeholders to participate in the planning process. This planning process also included review and incorporation of other existing plans, documents, and studies related to reducing the effects of natural disasters, so as to avoid duplication and streamline hazard mitigation efforts. The following outlines the planning process:

Planning Process

Collin County has been and continues to be proactive in efforts to provide a comprehensive hazard mitigation program. Preparation and use of the Hazard Mitigation Action Plan is expected to bring an even higher level of cohesion and direction to emergency preparation in Collin County.

As a contributor to the Collin County Hazard Mitigation Action Plan (HazMAP), all jurisdictions participated in the planning process. Emergency management staff assessed a readiness to plan, secured political support from elected officials, and began to engage the communities in the process of emergency planning.

Public Involvement

The Hazard Mitigation Planning Team knows that participation and feedback from their community is pertinent in developing a successful Hazard Mitigation Action Plan. Collin County worked to increase public response to the plan by holding public meetings and posting notices on the County and city websites.

The HazMAP planning process provides an excellent avenue for residents to exchange quality information and improve the county response to emergencies. This is accomplished through speaking engagements, website information, disaster awareness campaigns and information pamphlets, among other opportunities.

Plan Incorporation

The Office of Emergency Management made efforts for a comprehensive mitigation plan by incorporating other city plans and creating layers of data. These layers were useful in determining vulnerabilities and susceptible neighborhoods. This information was used when creating current risk assessment data. City and County Appraisal Data (2020), and the Texas Forest Service and Texas Wildfire Risk Assessment

Summary Report were also incorporated. Other sources listed in the annexes were also used for the mitigation action plan.

By reviewing plans and documents from the sources listed in the individual annexes, the Hazard Mitigation Team was able to take pertinent information and turn it into the Hazard Mitigation Action Plan.

Chapter Three: Hazard Identification Risk Assessment

3.1 Profiling Hazards

The Hazard Mitigation Action Plan for Collin County is a tool to assist in the identification and documentation of all the hazards faced in the region.

The 2016 Collin County profile was one of many developed by the North Central Texas Council of Governments (NCTCOG) under the FEMA Hazard Mitigation program. These plans are created by compiling data from the NCTCOG regional natural hazards risk assessments, damage assessments, hazard profiling and identification as well as historical data and geographic information. The current update is an update versus rewrite, and is based on previous data. It is being updated by internal city and county staff.

Hazards Addressed The Collin County Hazard Mitigation Action Plan has identified the following natural hazards as having the potential to cause damage in the county. Of the 15 hazards identified in the State of Texas Hazard Mitigation Plan, 12 will be discussed. The remaining three (coastal erosion, land subsidence, and hurricane/tropical storm) have no impact on the area. Collin County is not in coastal area nor experience land subsidence so these hazards have been omitted at this time. This applies to all participating jurisdictions in this plan, as listed on page 1. Wildland fire, flooding, and dam failure are the only hazards recognized to have predictable vulnerable areas. All other hazards are equally likely to occur throughout Collin County jurisdictions.

Dam Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations.

There have not been any inundation studies for the dams in Collin County and the county does not have information from the owners or Emergency Operations Plans for the dams. Therefore, more research is needed for inundation data before the next update. The data presented is from the National Inventory of Dams (NID). Based on a quantitative analysis of the dams currently in place in Collin County and a qualitative analysis of the potential impacts that dam failures would have on the social, economic, and environmental components of the region, the risk of a dam failure hazard is moderate.

Drought Drought can be defined as a water shortage caused by the natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. It can be aggravated by other factors such as high temperatures, high winds, and low relative humidity. Texas experiences a cycle of extended wet and drought conditions that can extend over a period of months even years. Extended periods of drought can have an enormous impact on an area by affecting the abundance of water supply, the agriculture economy, and foundations of structures. Drought has the potential to occur within the entire planning area.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuing seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Due to the risk associated to a distant quake, earthquakes have the potential to occur anywhere within the planning area.

The most likely risk for a significant earthquake event is associated to a large quake which might occur in Missouri, Tennessee, or Oklahoma, though these earthquakes are probable to occur only once every 500 years. There is no history of earthquakes occurring within Collin County, however, there have been earthquakes measuring up to 3.7 on the Richter scale in nearby counties. Because of the lack of earthquake data for Collin County and increasing quakes in nearby jurisdictions, more research is needed.

Expansive Soils Expansive soils are soils that contain large percentages of swelling clays that may experience volume changes of up to 40% in the absence or presence of water. This type of plastic deformation is common in the North Central Texas region. Over time, expansive soils can be hazardous to buildings and other infrastructure, with the most extensive damage occurring to highways, streets, and building foundations. Expansive soils have the potential to affect the entire planning area, however a study needs to be conducted to collect more precise data.

Extreme Heat Extreme heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat can also be a factor that drastically impacts drought conditions as high temperatures lead to an increased rate of evaporation. Extreme heat can also lead to heat stroke and even death in vulnerable populations such as the elderly and the very young if exposed to the high temperatures for an extended period of time. Extreme heat has the potential to affect the entire planning area.

Flooding Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “25-year storm” and “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” most often refers to an area that is subject to inundation by a flood that has a one percent chance of occurring in any given year (commonly and incorrectly referred to as the 100-year floodplain). Common flooding hazards within the planning area include flash flooding and flood hazards resulting from new development.

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains, hurricanes, and tropical storms. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges.

Hail Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. Hail has the potential to occur within the entire planning area.

High Winds Wind is defined as the motion of air relative to the earth's surface. The horizontal component of the three-dimensional flow and the near-surface wind phenomenon are the most significant aspects of the hazard. Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornados because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds has the potential to occur within the entire planning area.

Lightning Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A "bolt" or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes. Bolts of lightning can reach temperatures approaching 50,000° Fahrenheit. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. Federal Emergency Management Agency states that an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. Lightning has the potential to occur anywhere in the planning area.

Tornado A tornado is a violently rotating column of air, in contact with the ground, both pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel. Tornadoes have the potential to occur anywhere in the planning area.

Wildland Fire Wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildland fires are fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is

virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted. For the purposes of this hazard analysis, wildland fires are assessed under what is known as the Wildland Urban Interface (WUI). The WUI is an area of development that is susceptible to wildland fires due to the amount of structures located in an area with vegetation that can act a fuel for a wildland fire. Wildfires are most likely to occur within the WUI.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. Winter storms have the potential to occur within the entire planning area. Cold snaps in which temperatures fall below the freezing point of 32° Fahrenheit do happen on an annual basis in the planning area and can lead to issues with infrastructure, especially frozen roads and bridges.

3.2 Location of Hazards

The following maps illustrate the location of the hazards in Collin County. Maps concerning tornado and hail incidents are in reference to previous events as they have equal potential to occur throughout the county. Winter storms, extreme heat, and drought have potential to occur equally throughout the county and their previous events data is not represented by a map. Likewise, it is assumed that those hazard listed as having equal potential to occur throughout the HazMAP planning area will affect the area as described in each city's critical infrastructure and structure maps G.1-G.6, in section 3.6.

Map Series A Dams/FLOOD ZONES

Map A.1 Collin County Dams/Floodzones
Map A.2 City of Allen Dams/Floodzones
Map A.3 City of Anna Dams/Floodzones
Map A.4 City of Blue Ridge Dams/Floodzones
Map A.5 City of Celina Dams/Floodzones
Map A.6 City of Fairview Dams/Floodzones
Map A.7 City of Farmersville Dams/Floodzones
Map A.8 City of Frisco Dams/Floodzones
Map A.9 City of Josephine Dams/Floodzones
Map A.10 City of Lavon Dams/Floodzones
Map A.11 City of Lowry Crossing Dams/Floodzones
Map A.12 City of Lucas Dams/Floodzones
Map A.13 City of Melissa Dams/Floodzones
Map A.14 City of Murphy Dams/Floodzones
Map A.15 City of New Hope Dams/Floodzones
Map A.16 City of Parker Dams/Floodzones
Map A.17 City of Princeton Dams/Floodzones
Map A.18 City of Prosper Dams/Floodzones
Map A.19 City of St. Paul Dams/Floodzones
Map A.20 City of Wylie Dams/Floodzones

Map Series B – Land Use and Critical Infrastructure

Map B.1 Collin County Land Use and Critical Infrastructure

Map Series C Hail Incident

Map C.1 Collin County Hail Incidents

Map Series D Tornado Incident

Map D.1 Collin County Tornado Incidents

Map Series E Wildfire Risk Assessment

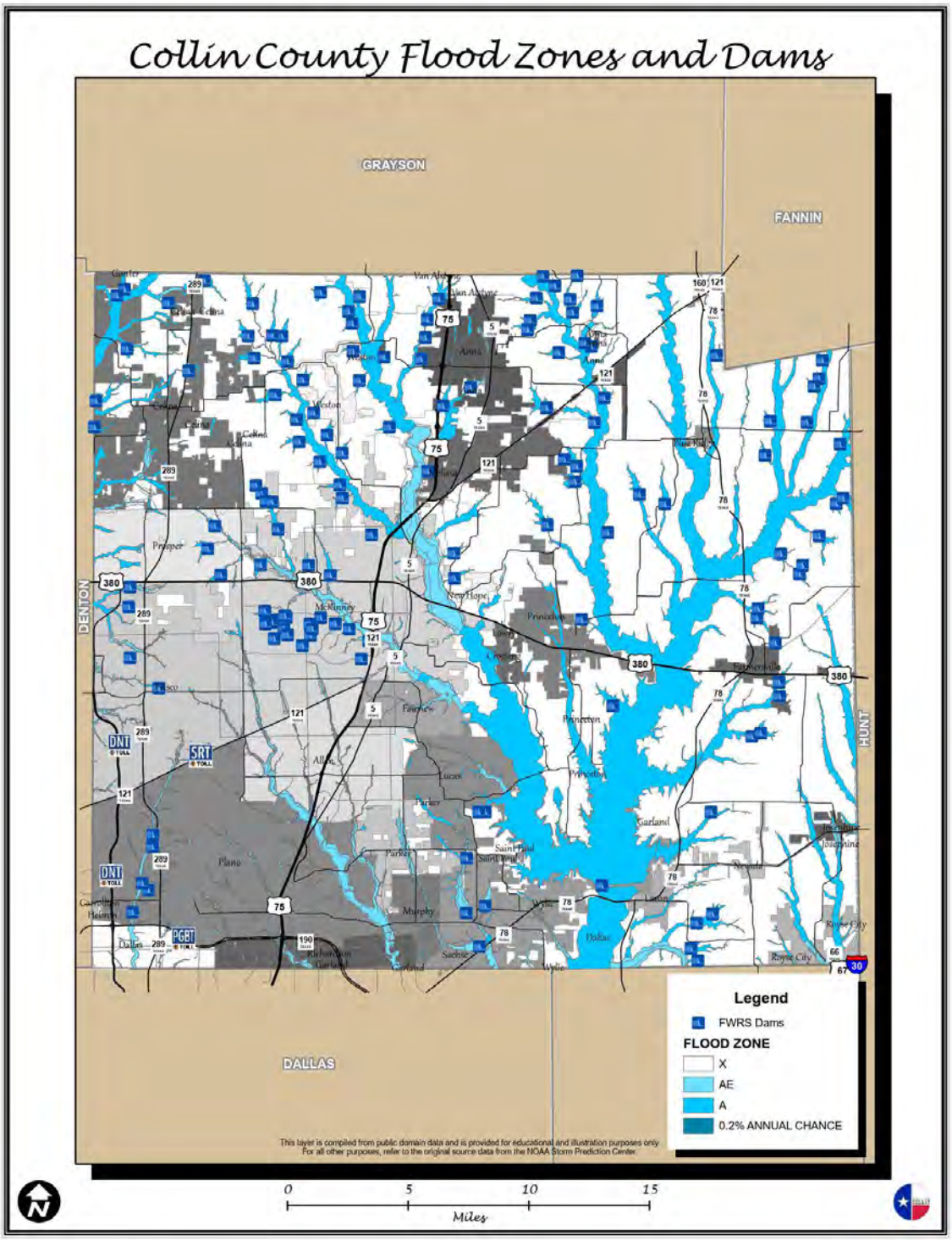
Map E.1 Collin County Wildfire Threat
Map E.2 City of Allen Wildfire Threat
Map E.3 City of Anna Wildfire Threat
Map E.4 City of Blue Ridge Wildfire Threat

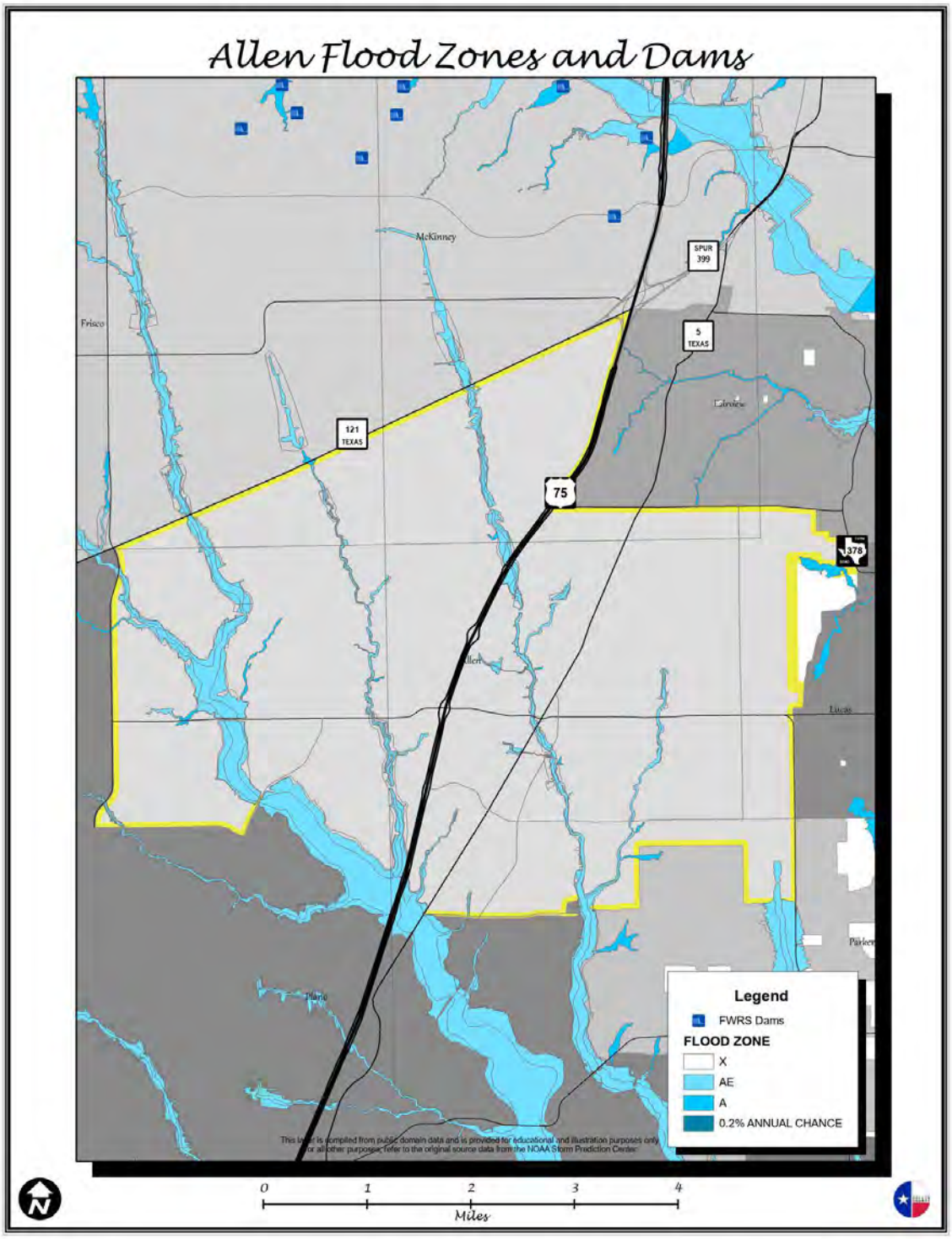
Map E.5 City of Celina Wildfire Threat
Map E.6 City of Fairview Wildfire Threat
Map E.7 City of Farmersville Wildfire Threat
Map E.8 City of Frisco Wildfire Threat
Map E.9 City of Josephine Wildfire Threat
Map E.10 City of Lavon Wildfire Threat
Map E.11 City of Lowry Crossing Wildfire Threat
Map E.12 City of Lucas Wildfire Threat
Map E.13 City of Melissa Wildfire Threat
Map E.14 City of Murphy Wildfire Threat
Map E.15 City of New Hope Wildfire Threat
Map E.16 City of Parker Wildfire Threat
Map E.17 City of Princeton Wildfire Threat
Map E.18 City of Prosper Wildfire Threat
Map E.19 City of St. Paul Wildfire Threat
Map E.20 City of Wylie Wildfire Threat

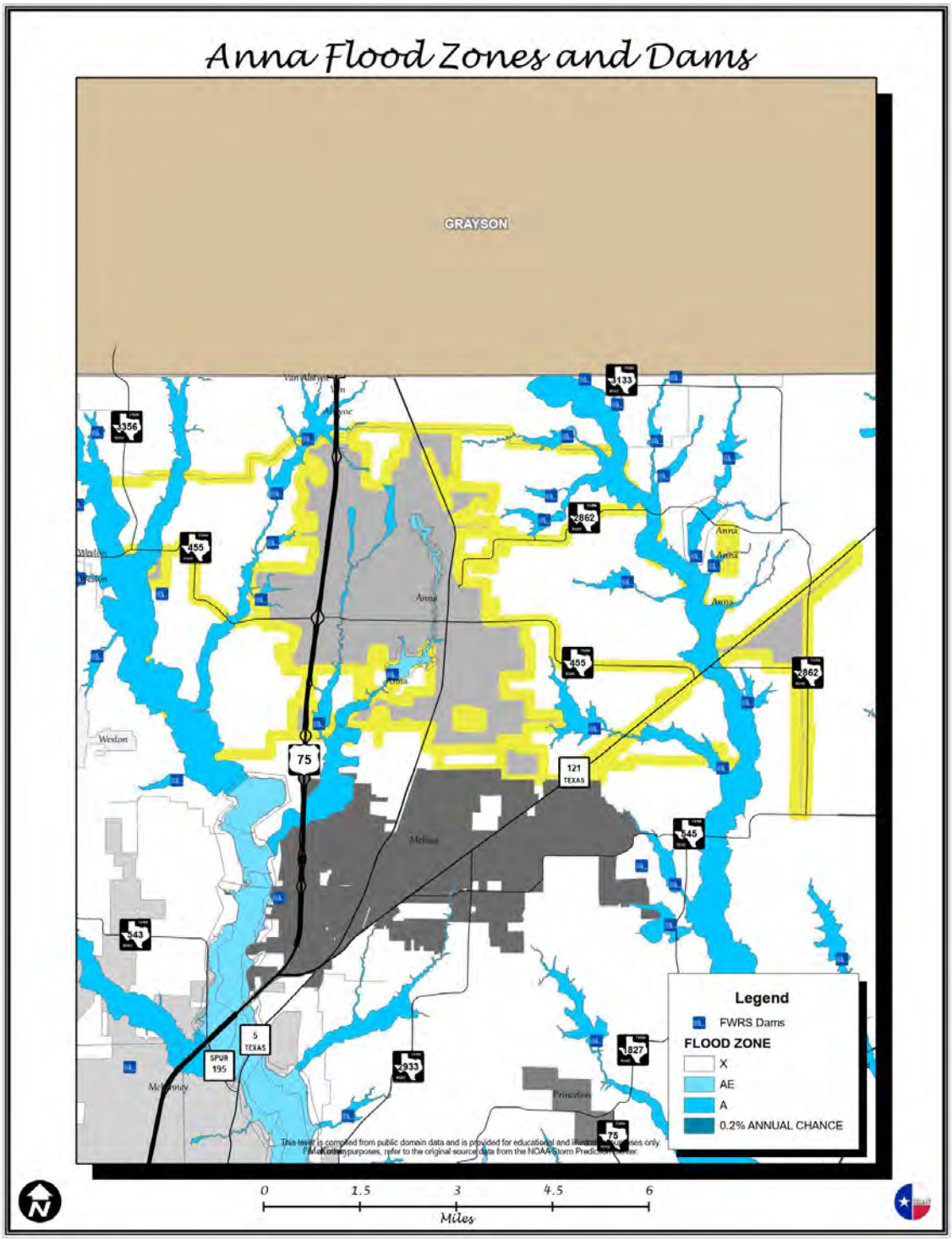
Map Series F Wildland Urban Interface

Map F.1 Collin County Wildland Urban Interface
Map F.2 City of Allen Wildland Urban Interface
Map F.3 City of Anna Wildland Urban Interface
Map F.4 City of Blue Ridge Wildland Urban Interface
Map F.5 City of Celina Wildland Urban Interface
Map F.6 City of Fairview Wildland Urban Interface
Map F.7 City of Farmersville Wildland Urban Interface
Map F.8 City of Frisco Wildland Urban Interface
Map F.9 City of Josephine Wildland Urban Interface
Map F.10 City of Lavon Wildland Urban Interface
Map F.11 City of Lowry Crossing Wildland Urban Interface
Map F.12 City of Lucas Wildland Urban Interface
Map F.13 City of Melissa Wildland Urban Interface
Map F.14 City of Murphy Wildland Urban Interface
Map F.15 City of New Hope Wildland Urban Interface
Map F.16 City of Parker Wildland Urban Interface
Map F.17 City of Princeton Wildland Urban Interface
Map F.18 City of Prosper Wildland Urban Interface
Map F.19 City of St. Paul Wildland Urban Interface
Map F.20 City of Wylie Wildland Urban Interface

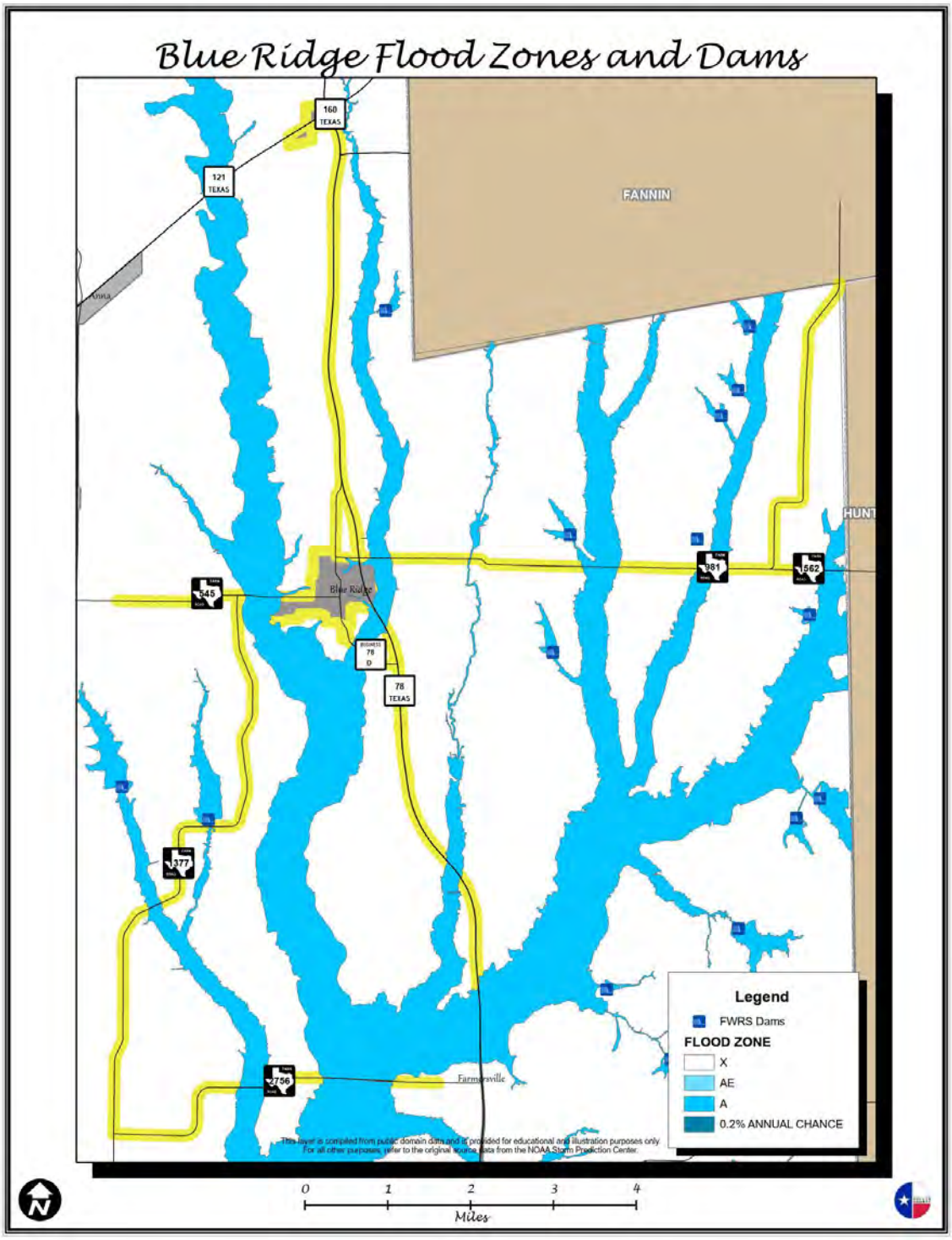
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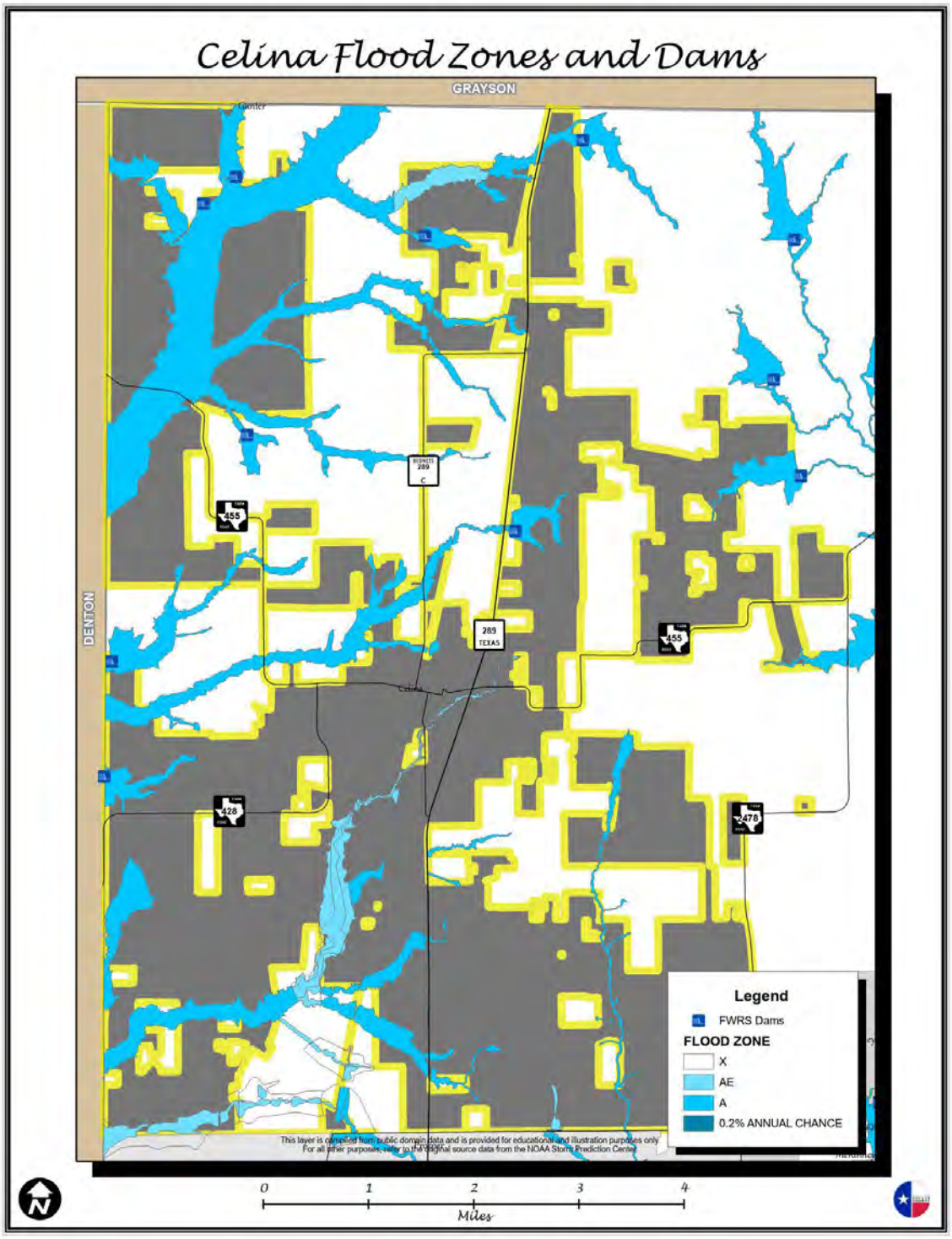

Collin County Flood Zones and Dams
GRAYSON
FANNIN
DENTON
HUNT
DALLAS
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
5
10
15
Miles

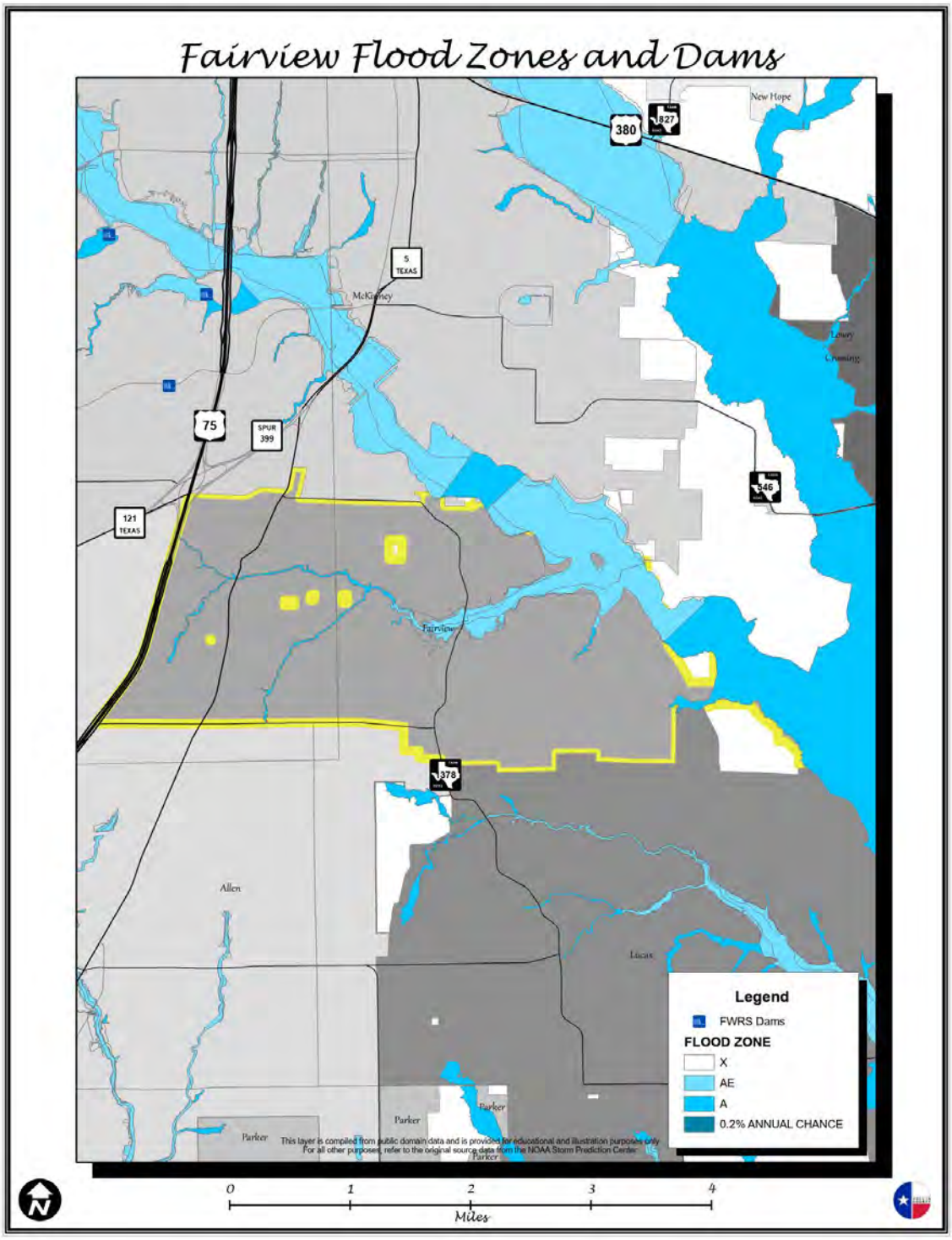

Allen Flood Zones and Dams
McKinney
Frisco
SPUR 399
5 TEXAS
121 TEXAS
75
378
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
0
1
2
3
4
Miles

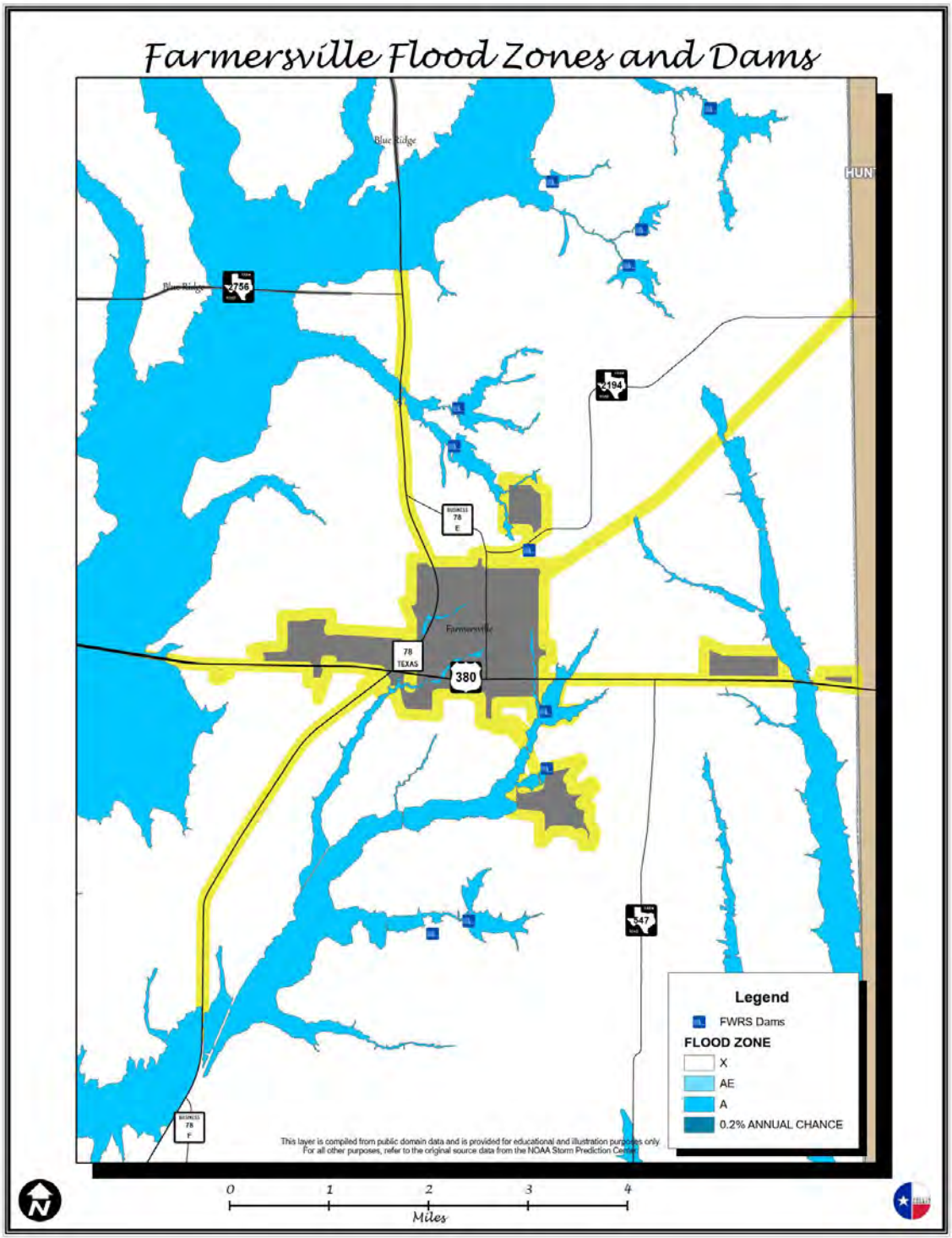

Anna Flood Zones and Dams
GRAYSON
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
0
1.5
3
4.5
6
Miles
Weston
Melissa
Anna
Princeton
McKinney
75
121
TEXAS
455
543
545
862
933
827
133
356

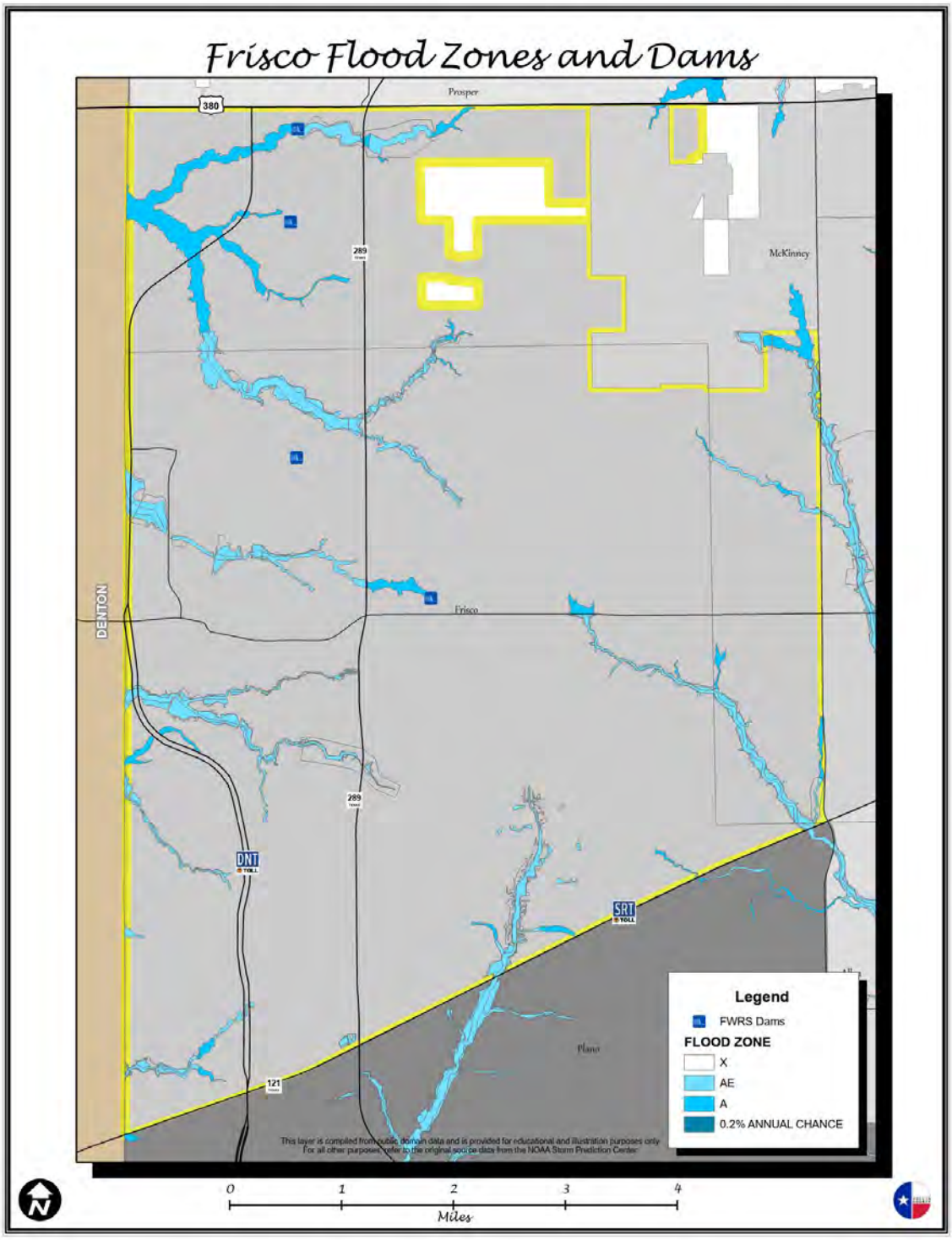
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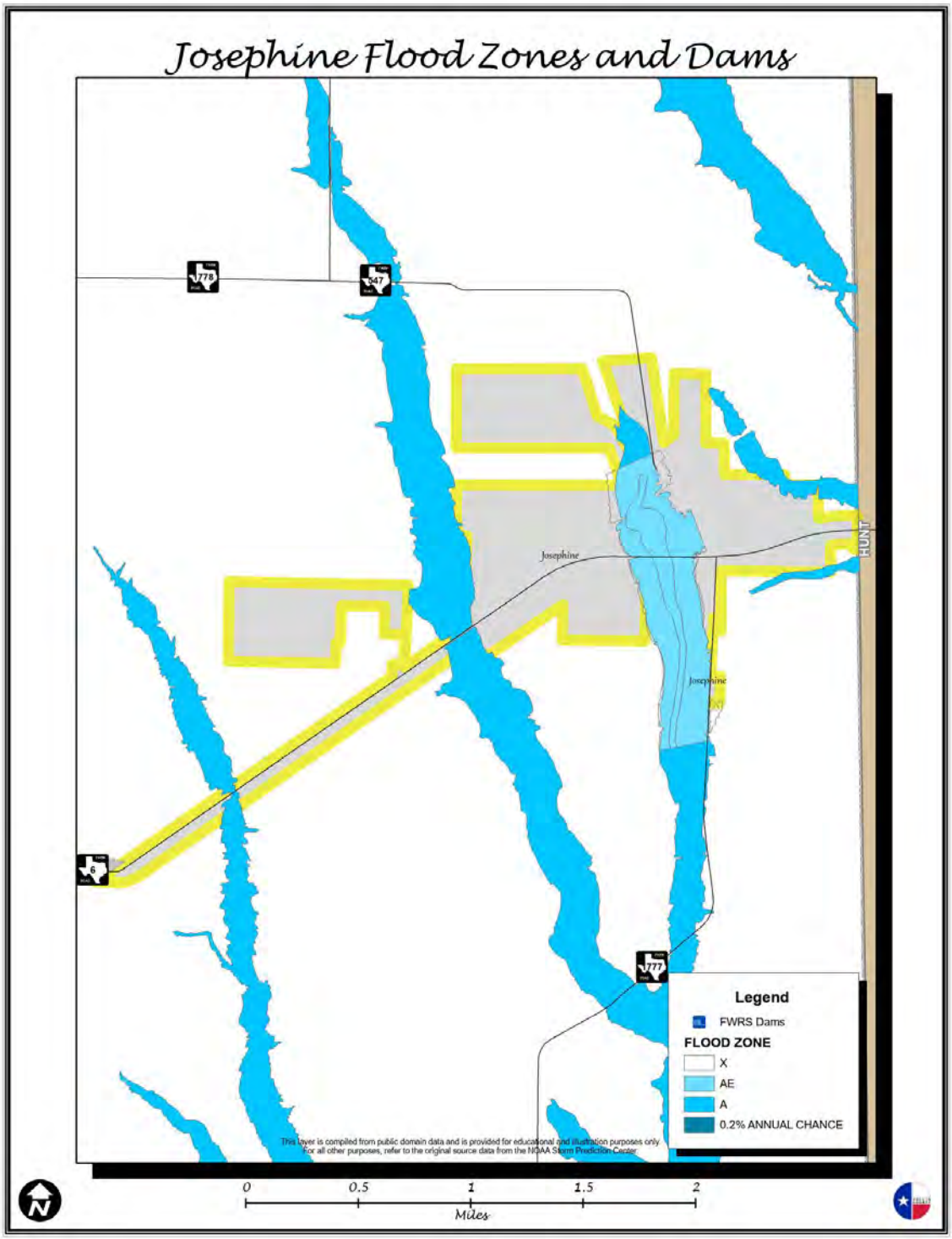

Blue Ridge Flood Zones and Dams
160
TEXAS
121
TEXAS
FANNIN
HUNT
Blue Ridge
545
981
562
78
TEXAS
377
756
Farmersville
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only.
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
1
2
3
4
Miles

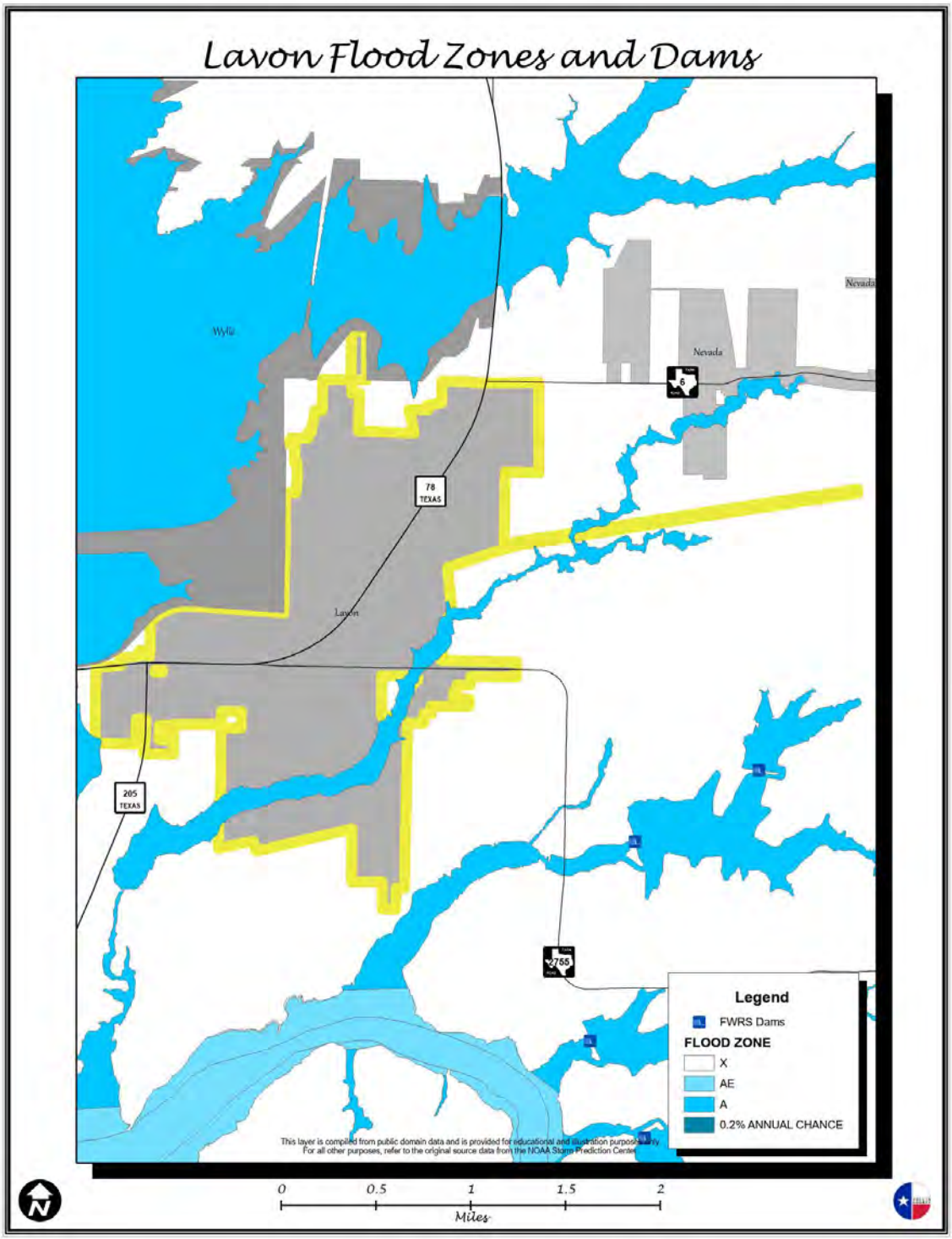

Celina Flood Zones and Dams
GRAYSON
DENTON
455
289
TEXAS
428
478
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
1
2
3
4
Miles

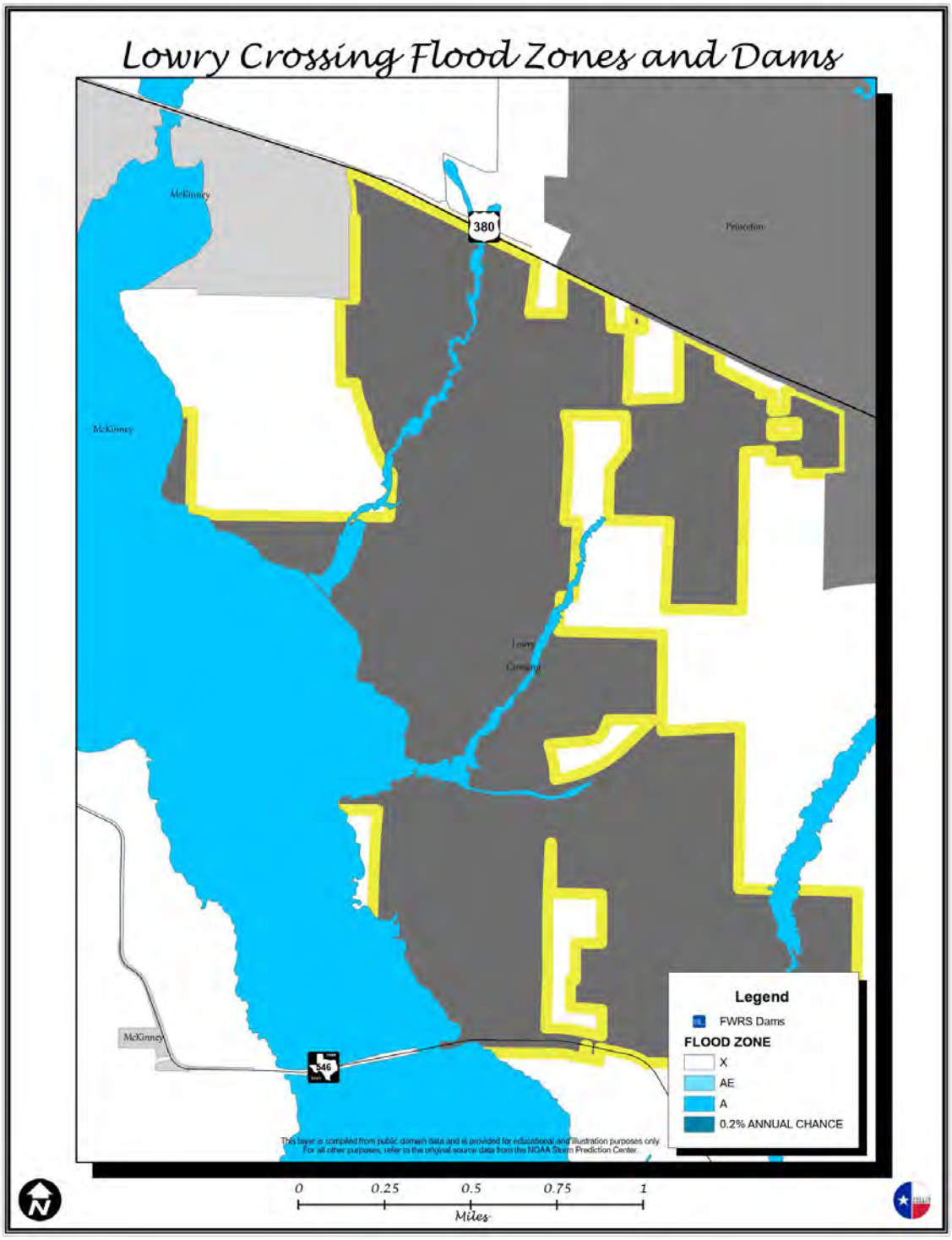

Fairview Flood Zones and Dams
New Hope
380
1827
5
TEXAS
McKinney
Lowry Crossing
75
SPUR
399
121
TEXAS
546
Fairview
378
Allen
Lucas
Parker
Parker
Parker
Parker
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
1
2
3
4
Miles

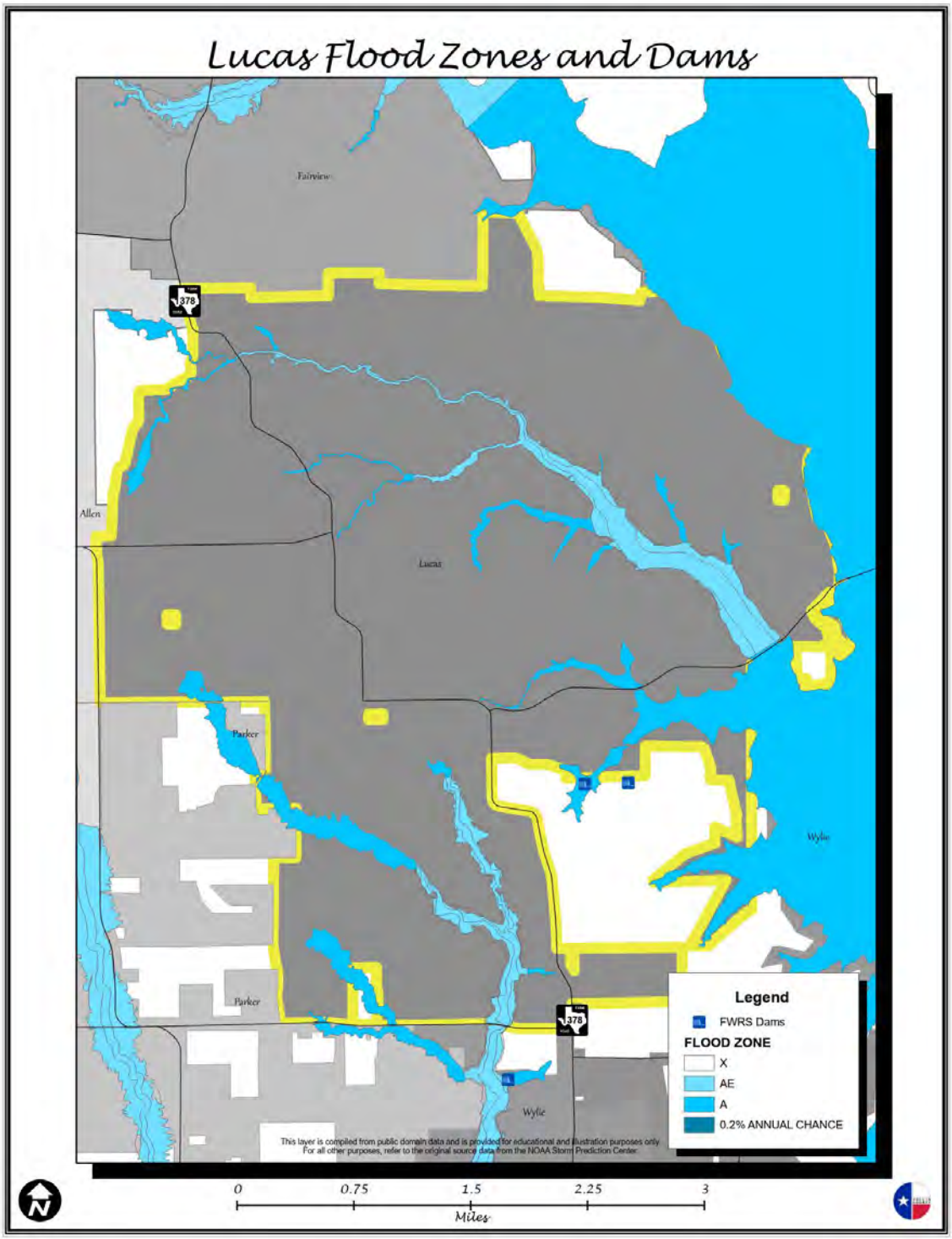

Farmersville Flood Zones and Dams
Blue Ridge
HUN
2756
2194
78
E
Farmersville
78
TEXAS
380
547
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only.
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
1
2
3
4
Miles

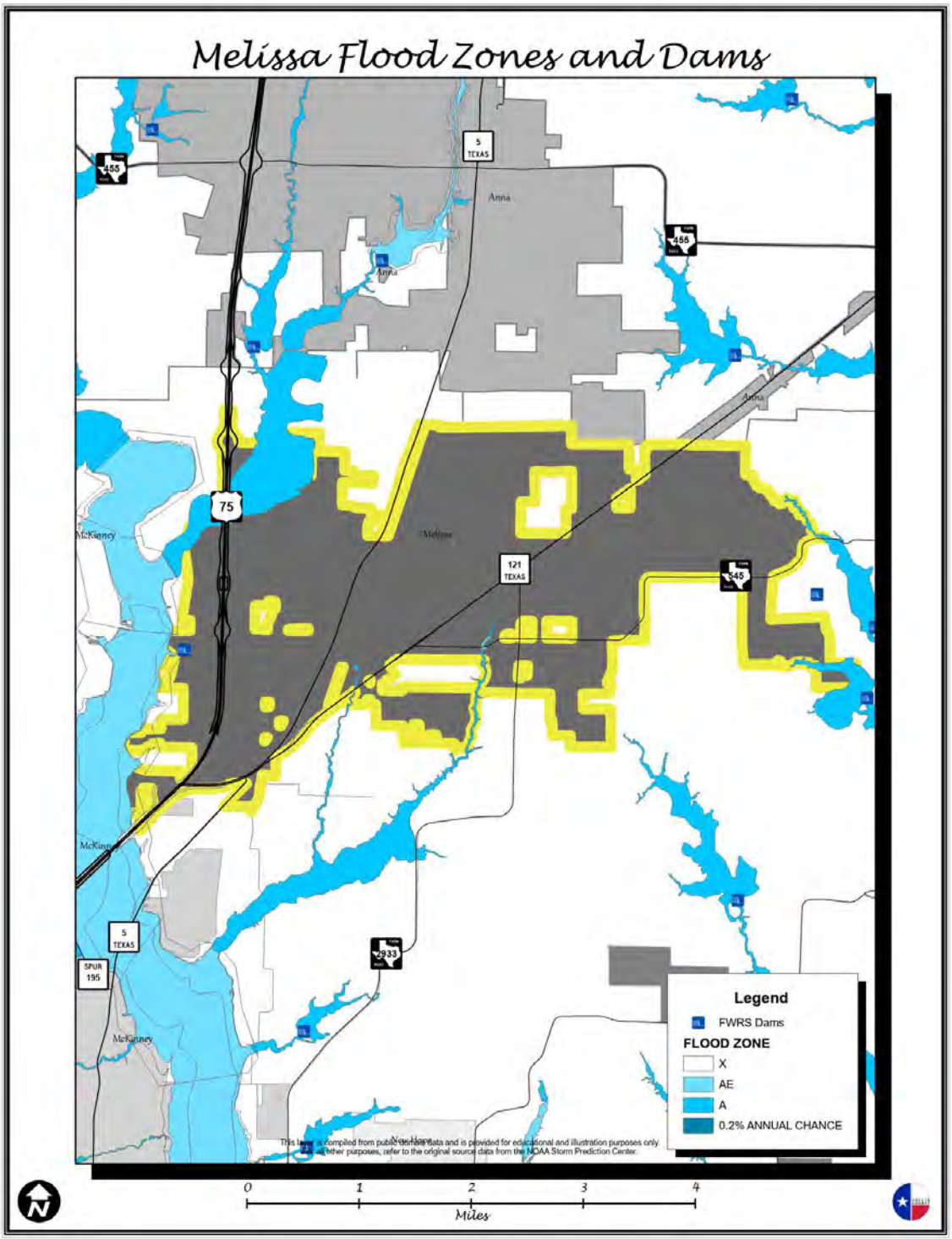

Frisco Flood Zones and Dams
Prosper
380
289
McKinney
DENTON
Frisco
DNT
SRT
121
Plano
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
1
2
3
4
Miles

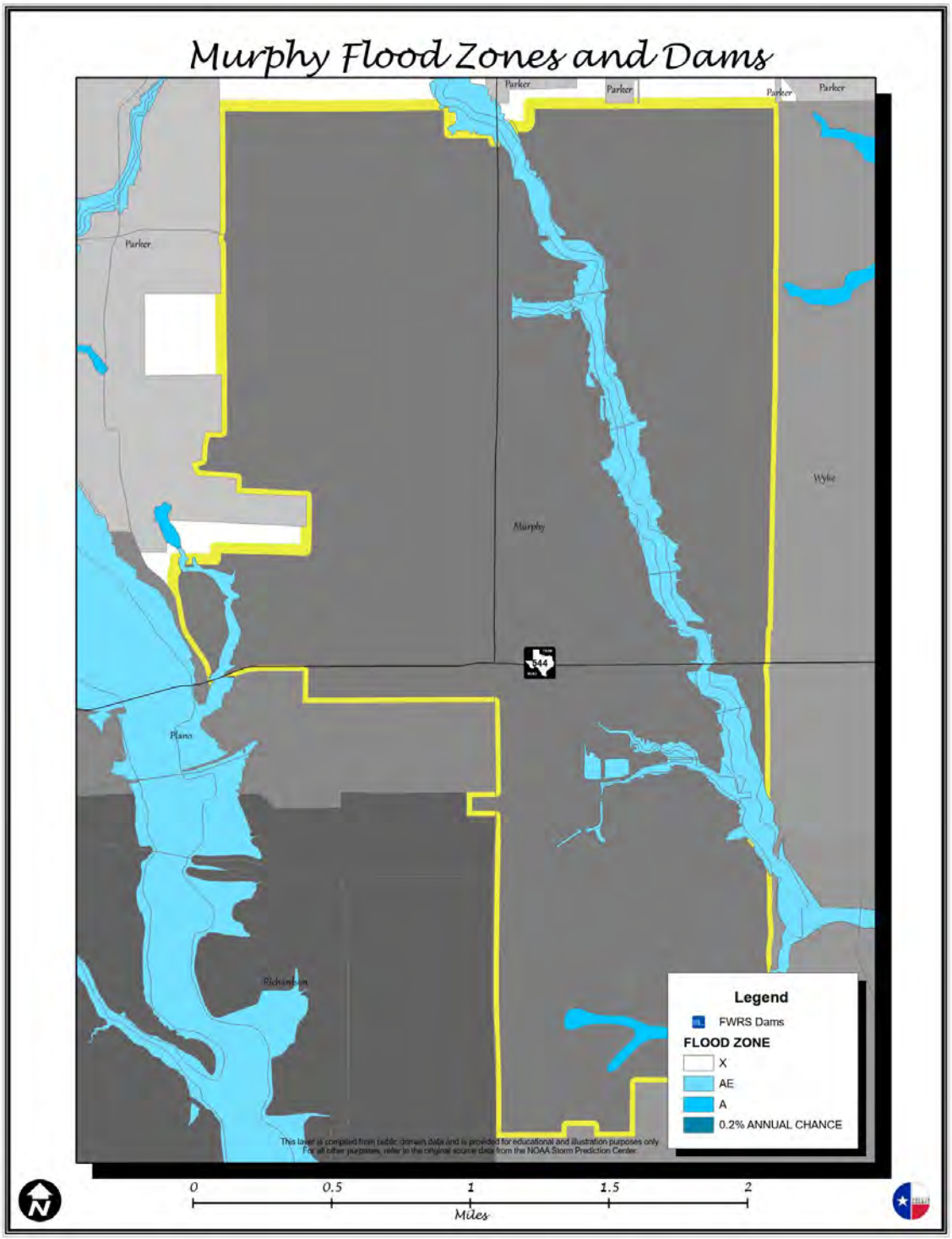

Josephine Flood Zones and Dams
Josephine
Josephine
HUNT
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only. For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
0.5
1
1.5
2
Miles

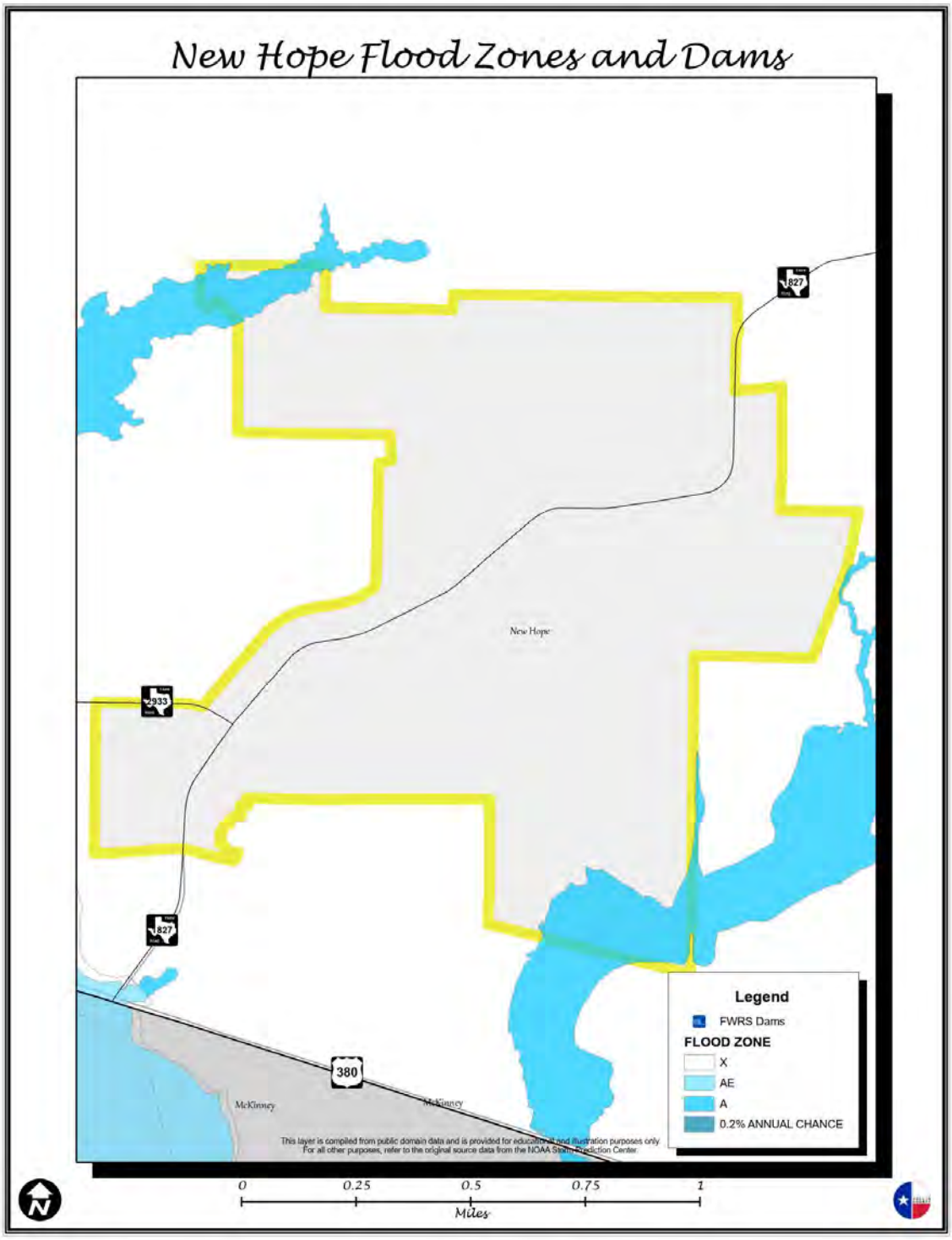

Lavon Flood Zones and Dams
Wylie
Nevada
Nevada
6
78
TEXAS
Lavon
205
TEXAS
2755
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only.
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
0.5
1
1.5
2
Miles

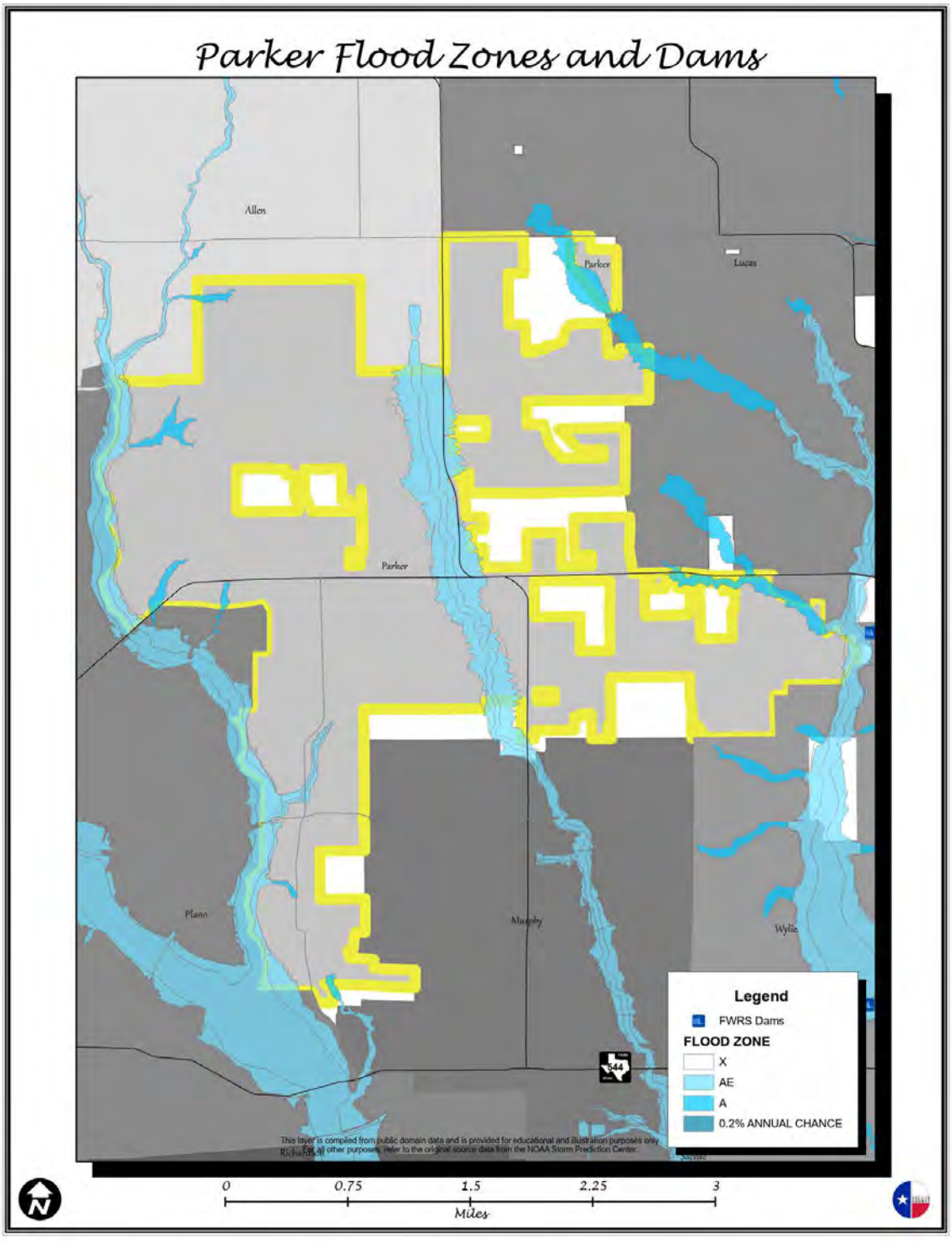

Lowry Crossing Flood Zones and Dams
380
McKinney
Princeton
Lowry Crossing
546
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
0
0.25
0.5
0.75
1
Miles

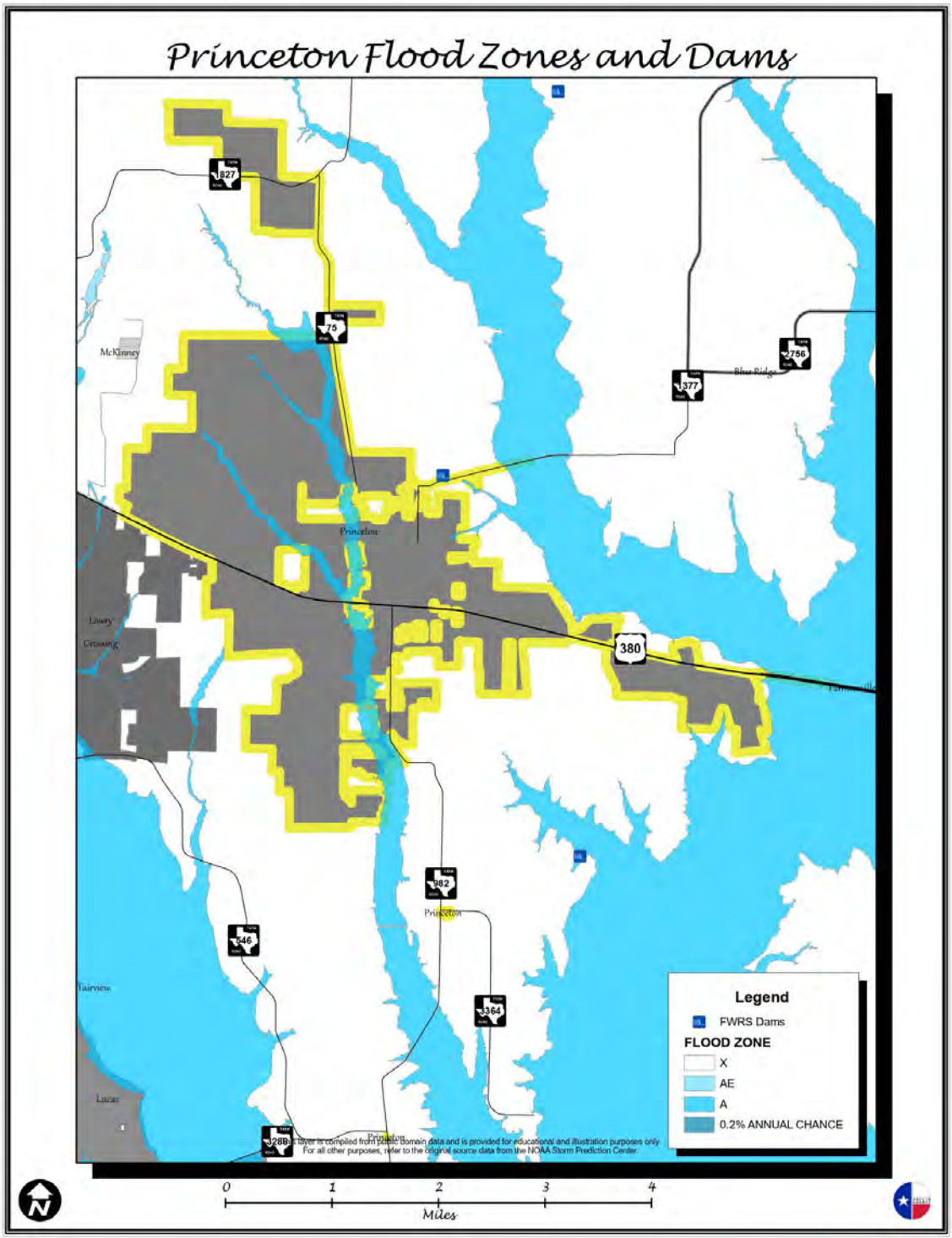

Lucas Flood Zones and Dams
Fairview
Allen
Lucas
Parker
Parker
Wylie
Wylie
378
378
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only. For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
0.75
1.5
2.25
3
Miles

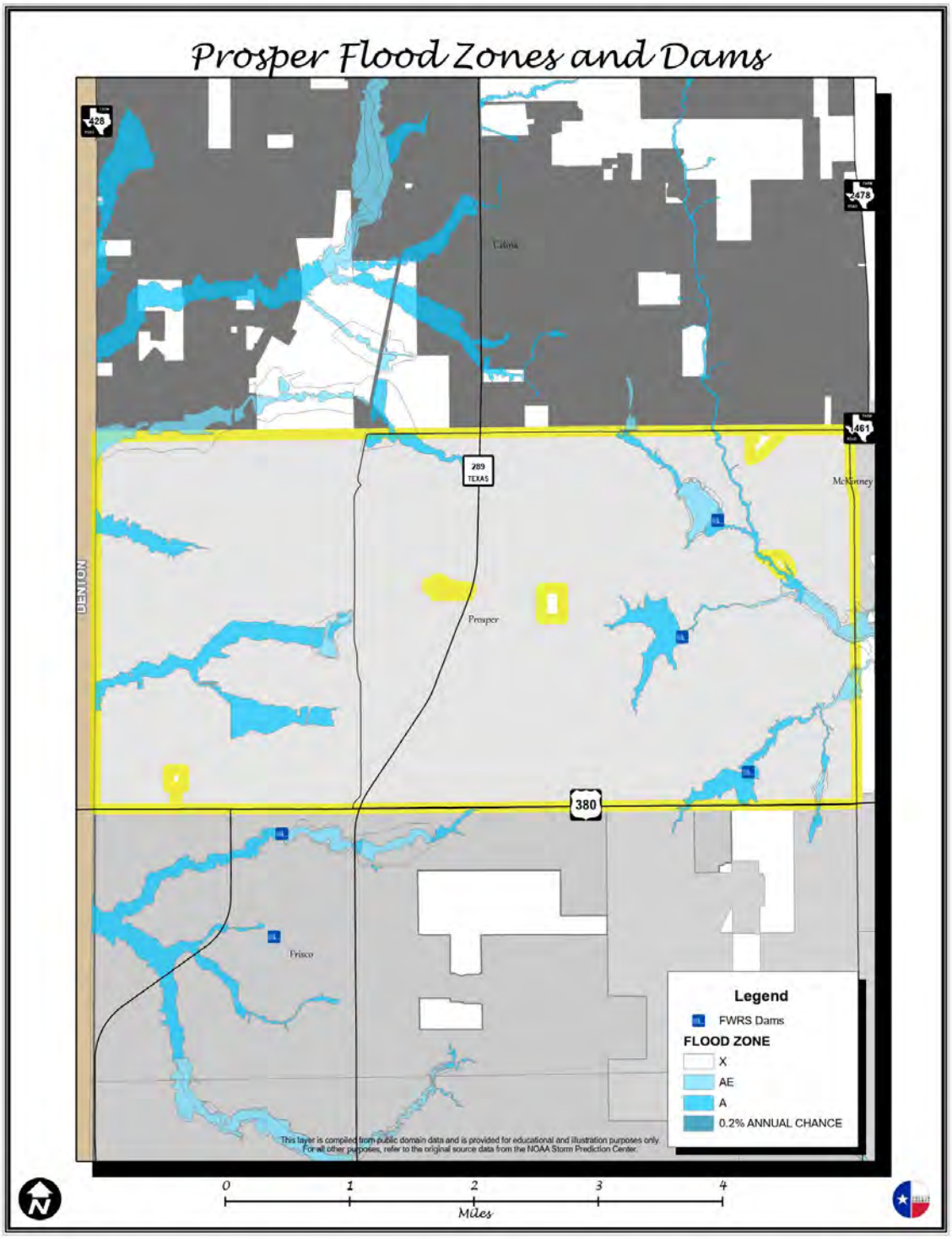

Melissa Flood Zones and Dams
Anna
McKinney
Melissa
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
0
1
2
3
4
Miles

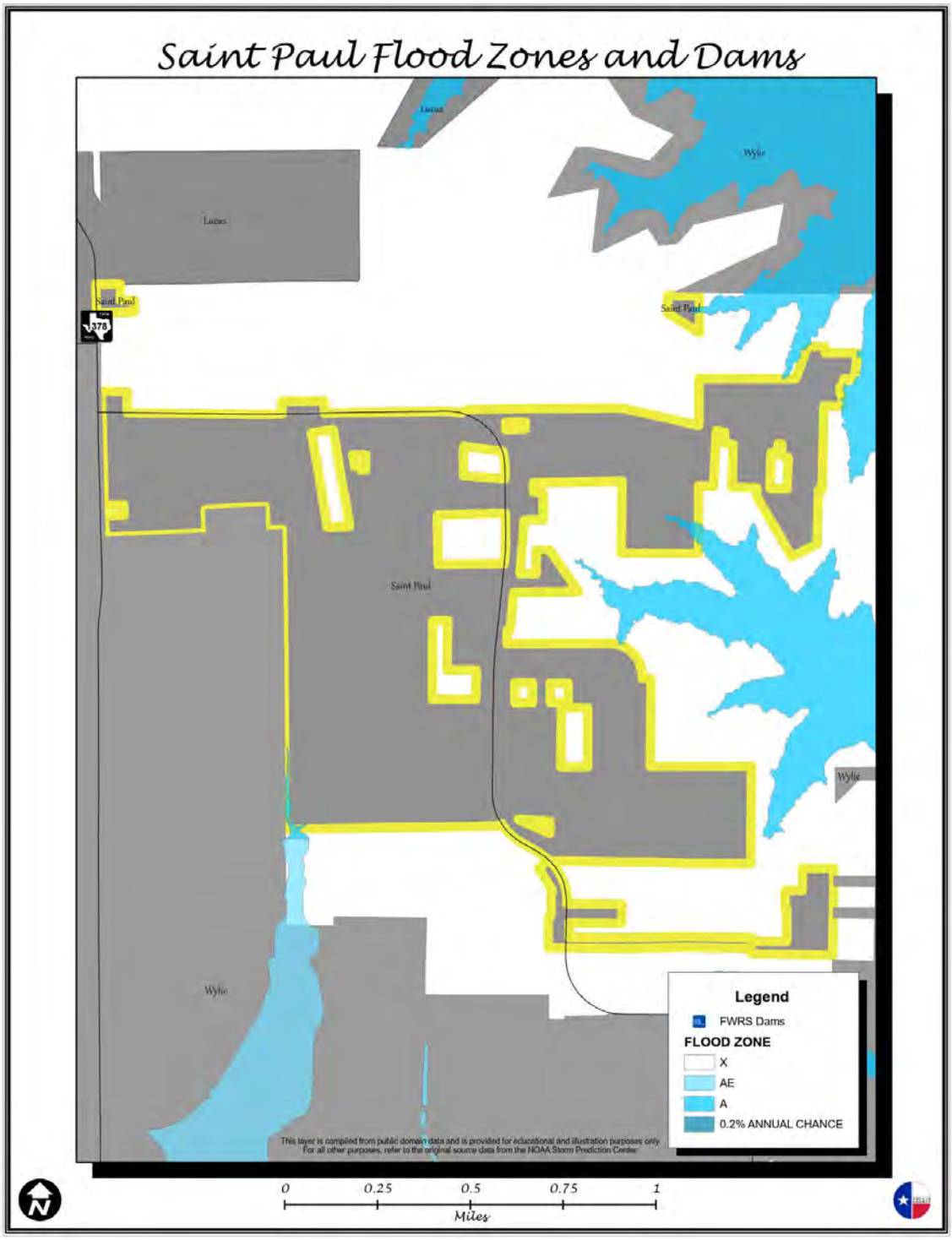

Murphy Flood Zones and Dams
Parker
Parker
Parker
Parker
Parker
Wylie
Murphy
544
Plano
Richardson
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only.
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
0.5
1
1.5
2
Miles

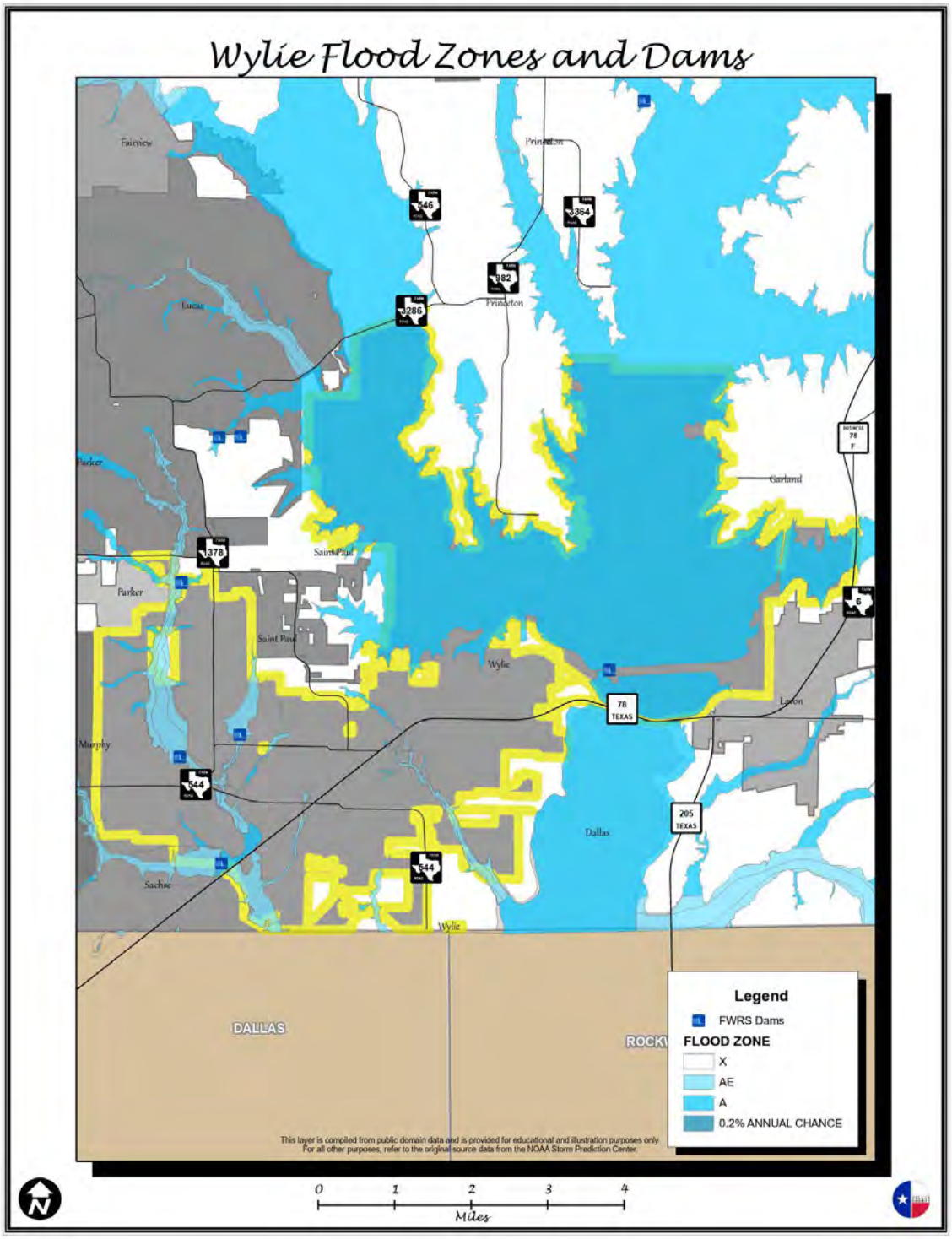

New Hope Flood Zones and Dams
New Hope
McKinney
McKinney
380
827
2933
827
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for education al and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
0.25
0.5
0.75
1
Miles


Parker Flood Zones and Dams
Allen
Parker
Lucas
Parker
Plano
Murphy
Wylie
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
0.75
1.5
2.25
3
Miles

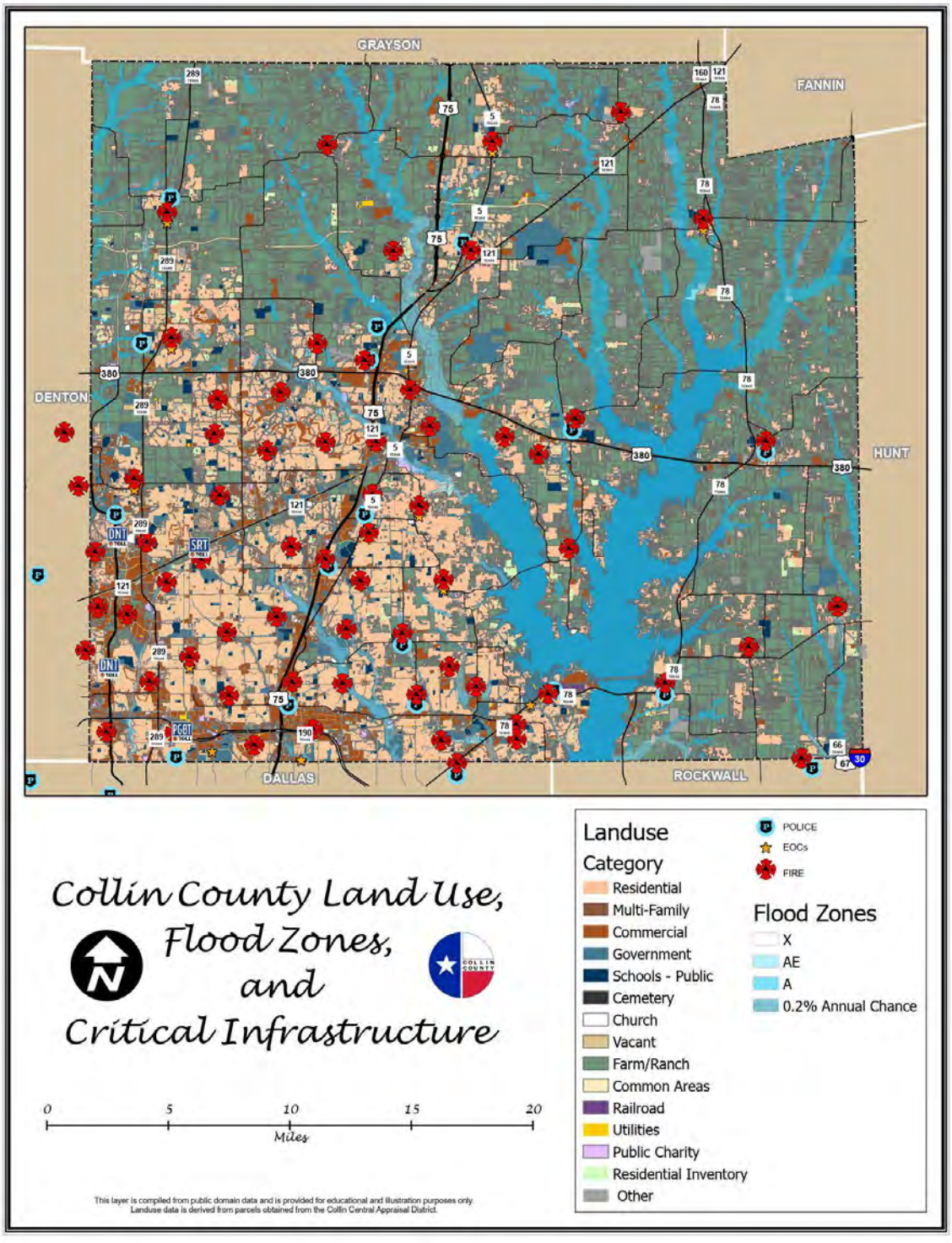

Princeton Flood Zones and Dams
McKinney
Princeton
Lowry Crossing
Fairview
Lucas
Blue Ridge
380
75
827
377
756
982
546
364
288
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
0 1 2 3 4
Miles


Prosper Flood Zones and Dams
428
478
461
289
TEXAS
380
DENTON
Celina
McKinney
Prosper
Frisco
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only. For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
1
2
3
4
Miles

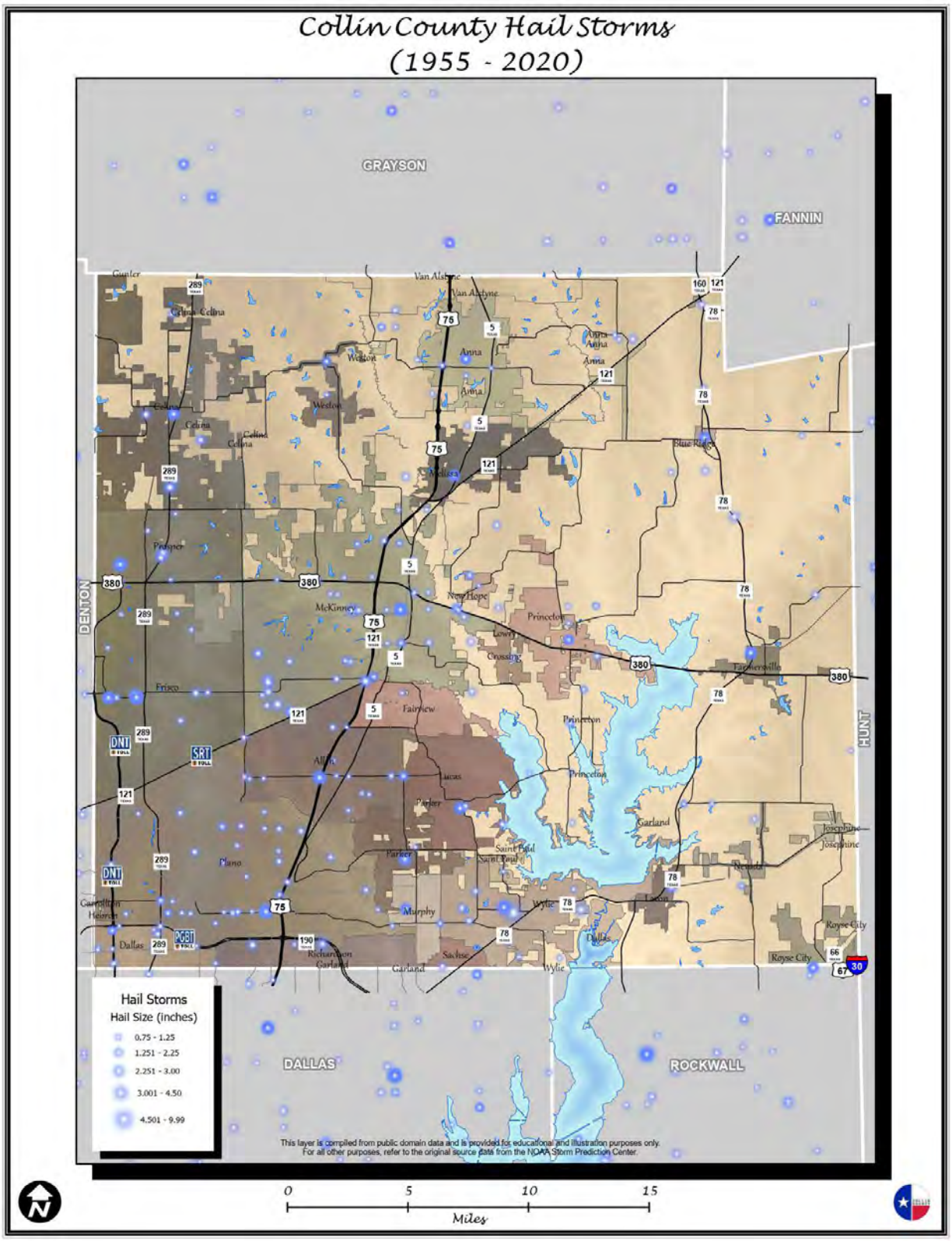

Saint Paul Flood Zones and Dams
Lucas
Wylie
Saint Paul
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center
0
0.25
0.5
0.75
1
Miles


Wylie Flood Zones and Dams
Fairview
Princeton
546
964
982
Princeton
Lucas
286
Parker
Garland
Saint Paul
378
Parker
Saint Paul
Wylie
6
78
TEXAS
Murphy
544
205
TEXAS
Dallas
544
Sachse
Wylie
DALLAS
Legend
FWRS Dams
FLOOD ZONE
X
AE
A
0.2% ANNUAL CHANCE
This layer is compiled from public domain data and is provided for educational and illustration purposes only
For all other purposes, refer to the original source data from the NOAA Storm Prediction Center.
0
1
2
3
4
Miles

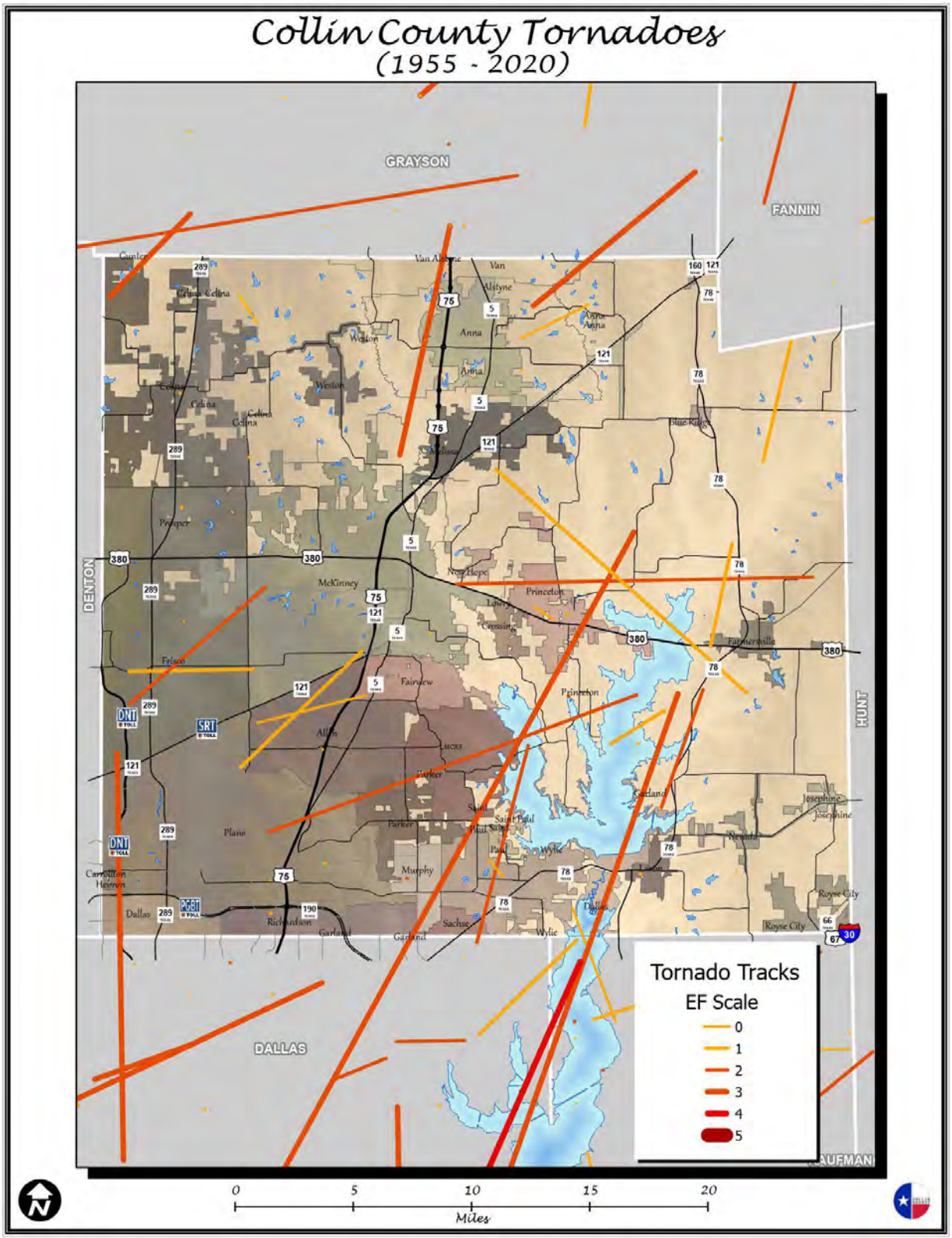
Map Series B – Land Use, Critical Infrastructure, and Flood Zones



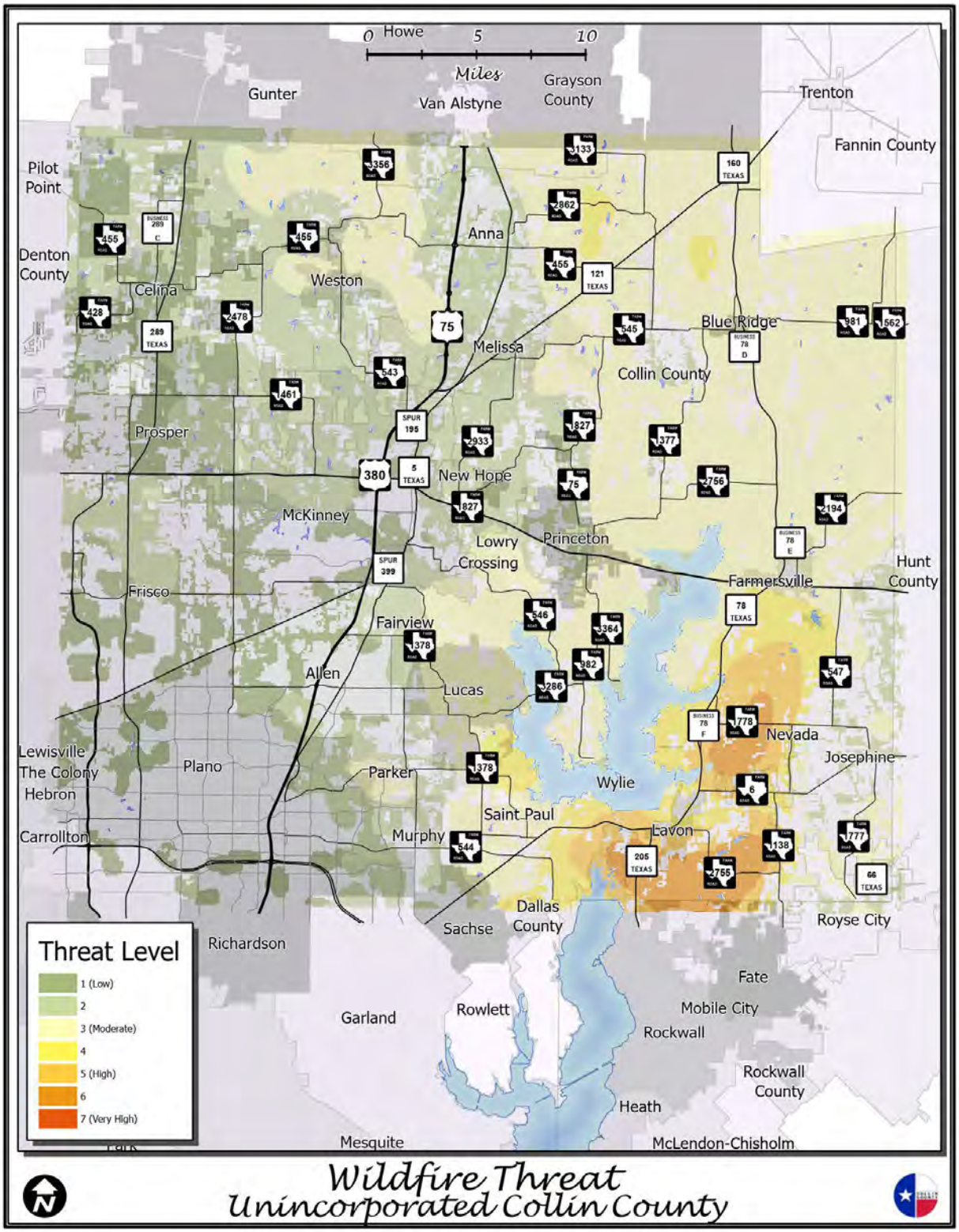
Map Series C – Hail Events

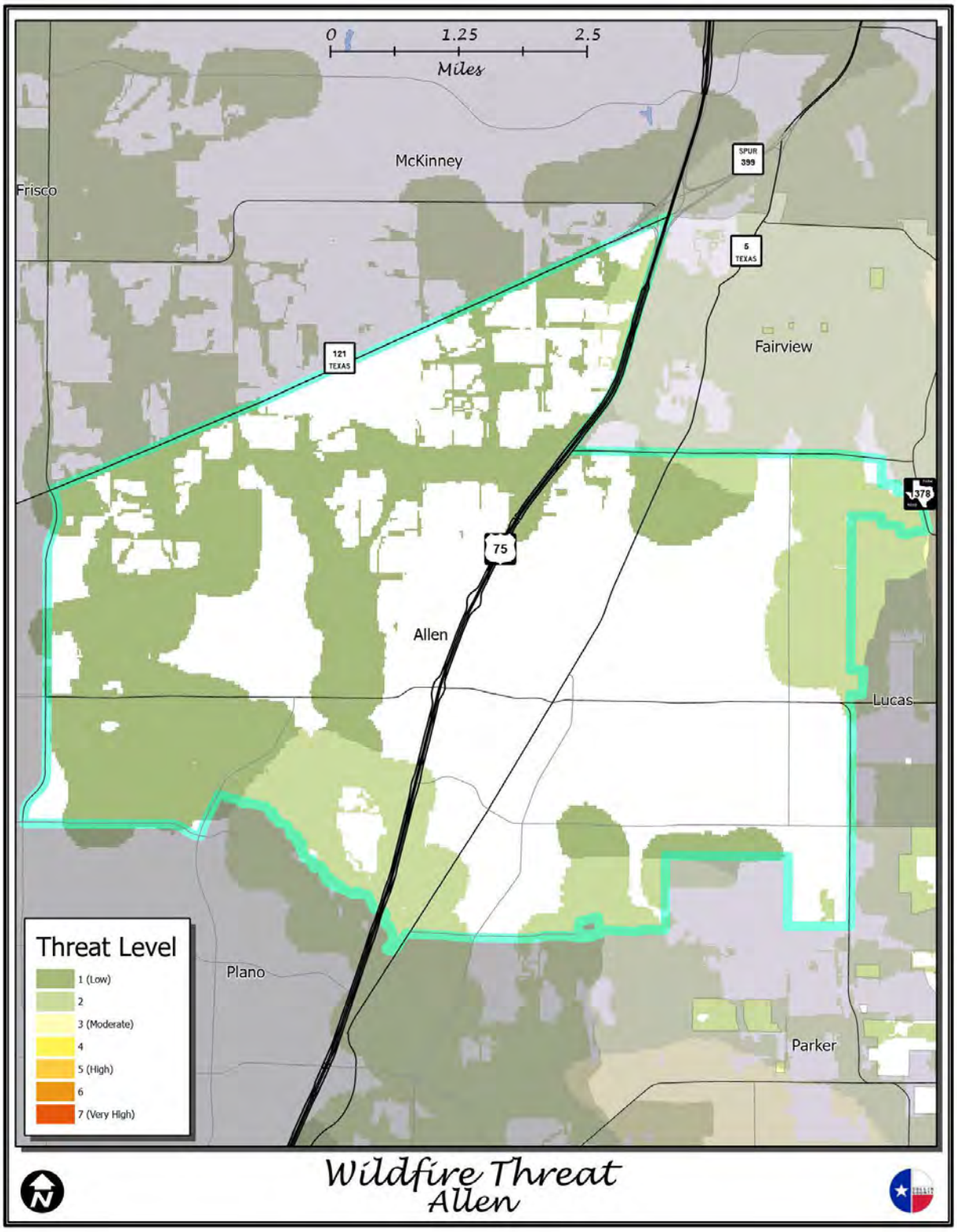


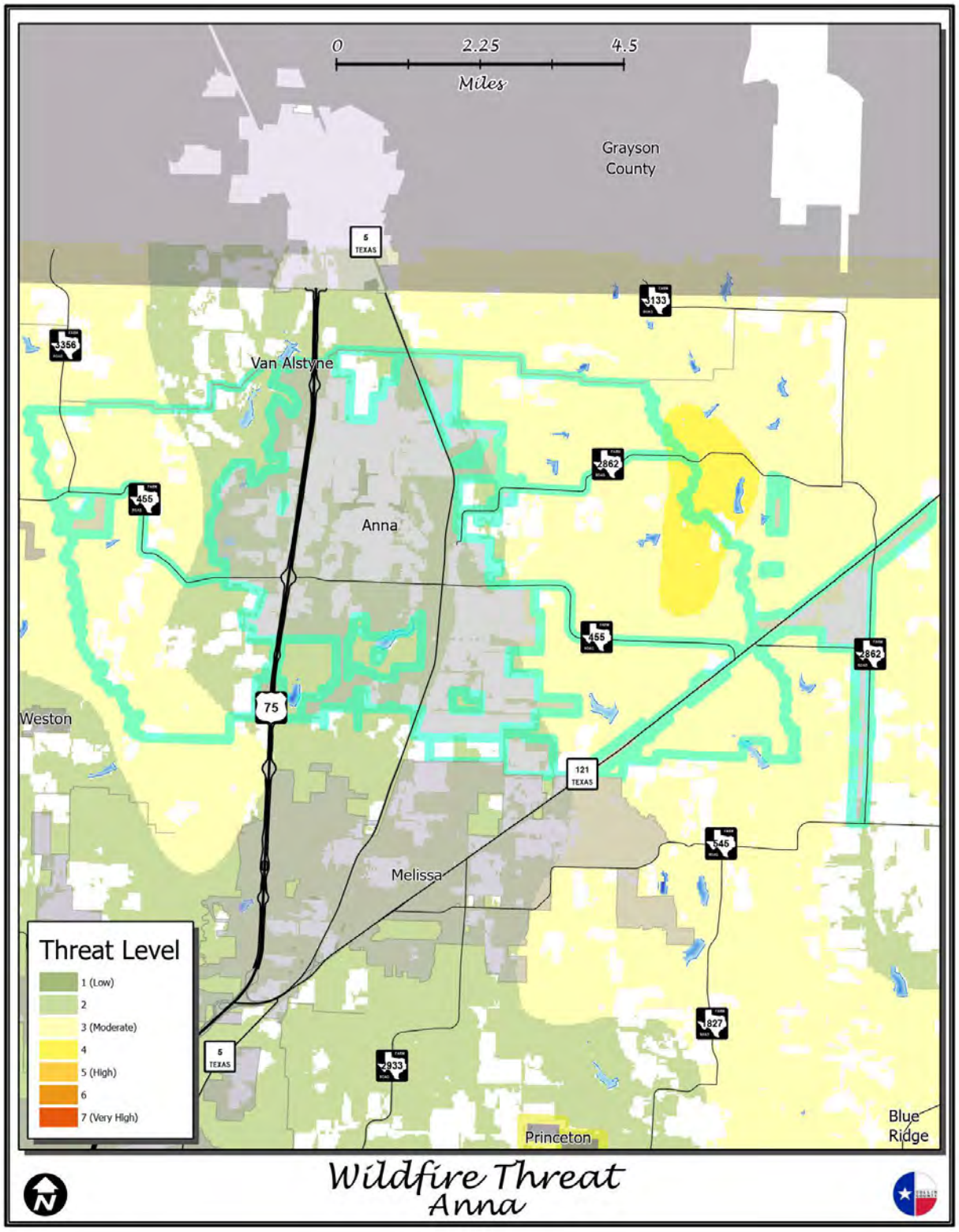
Map Series D – Tornado Events

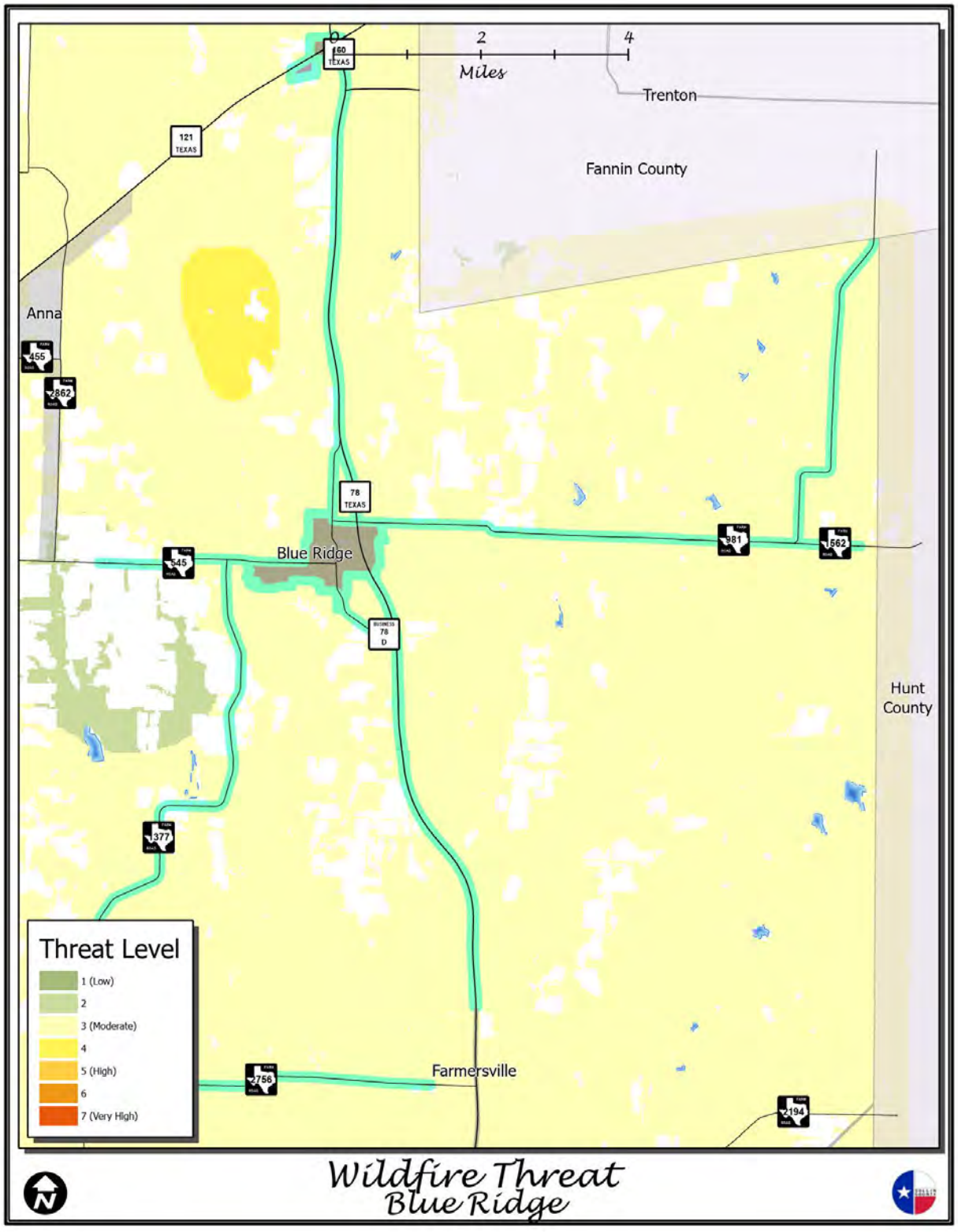


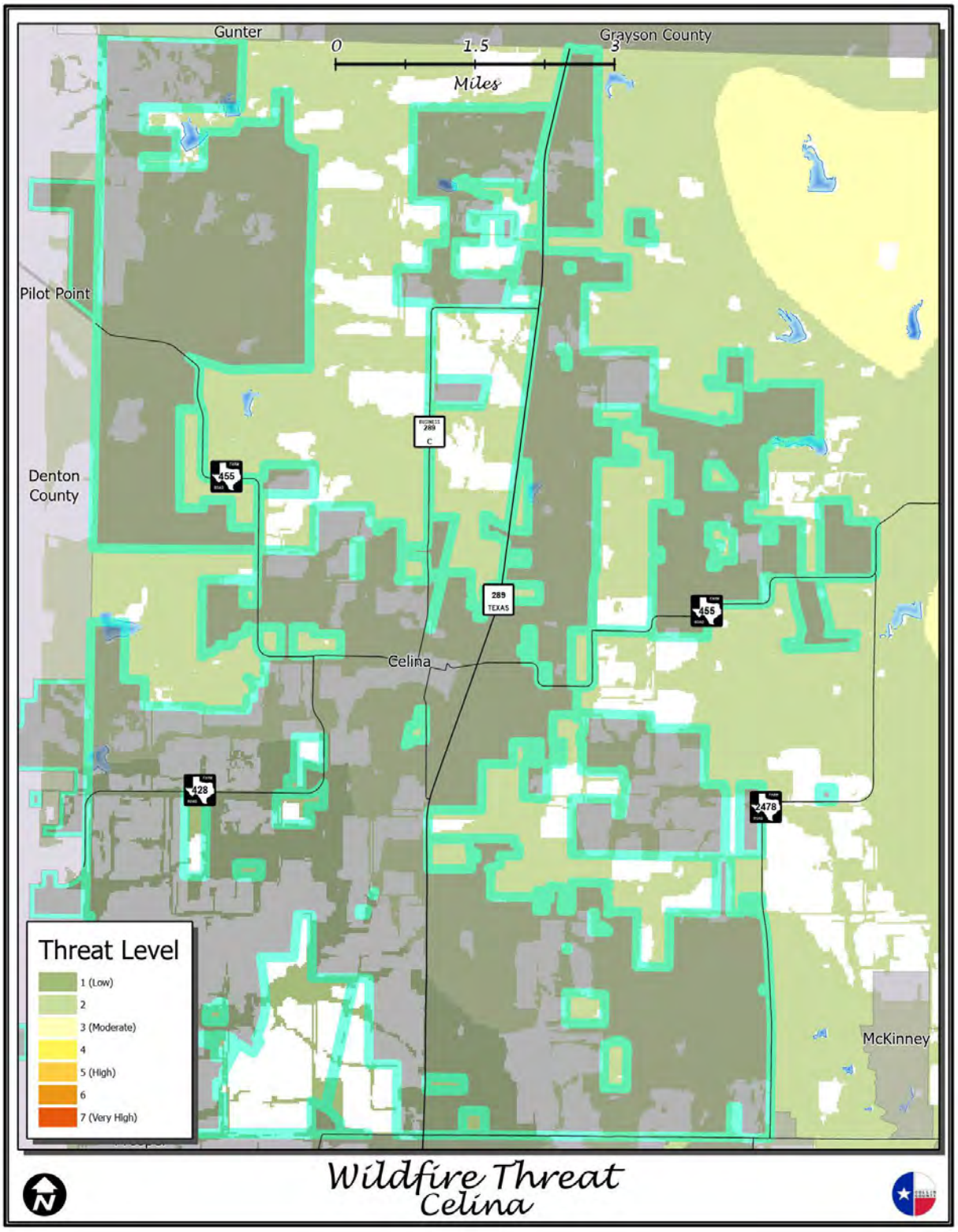
Map Series E – Wildfire Threat

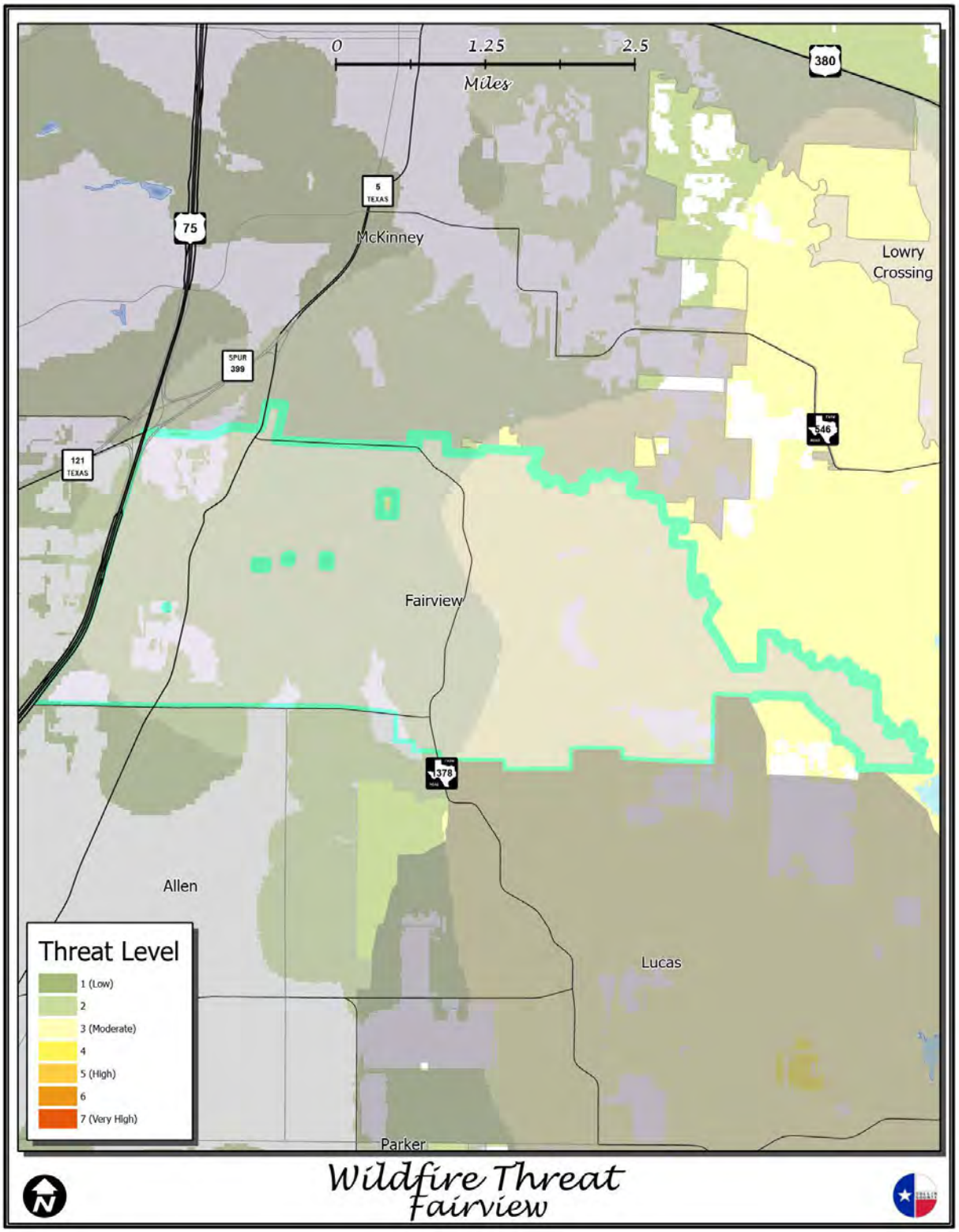


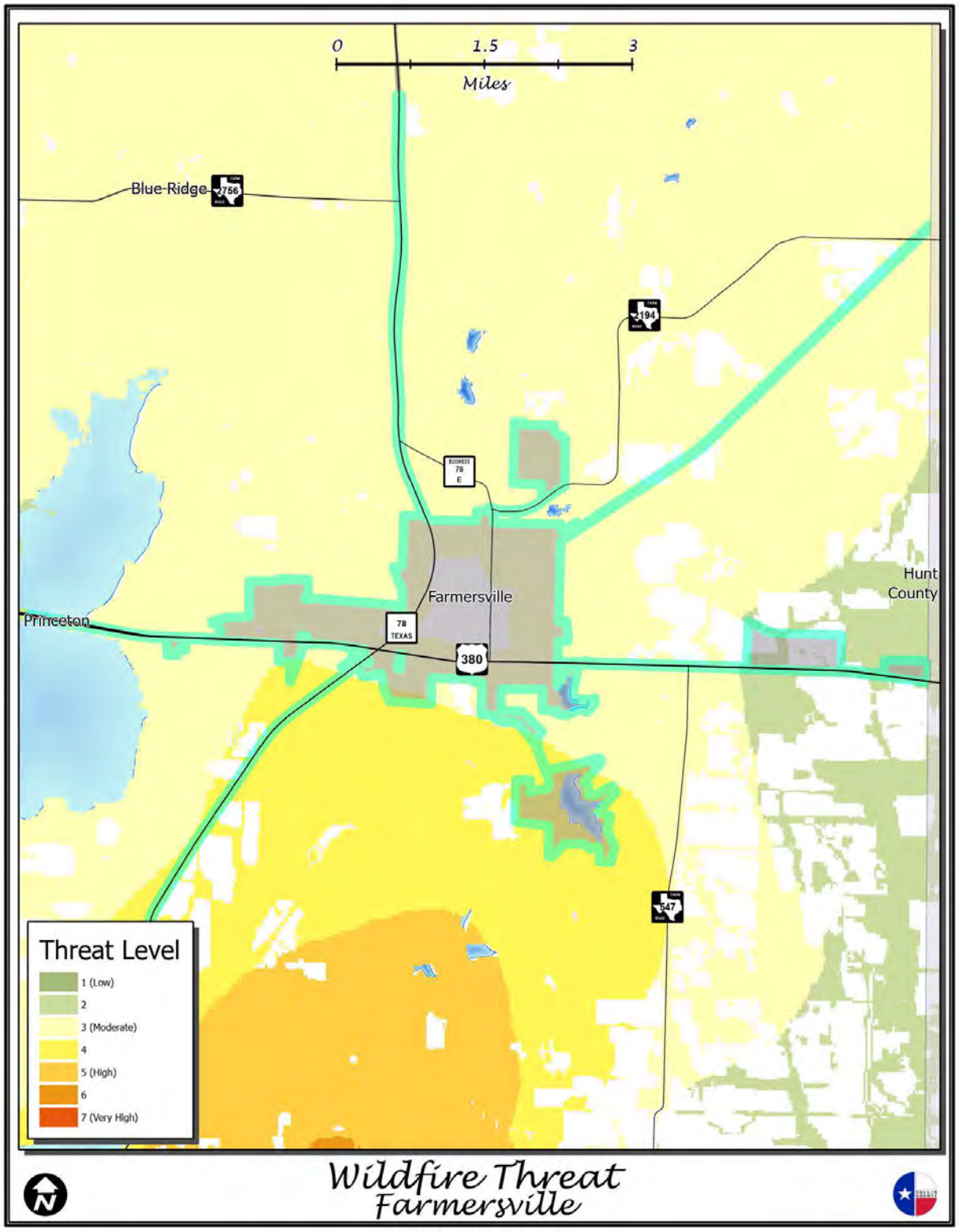

0
1.25
2.5
Miles
McKinney
Frisco
Fairview
Allen
Plano
Lucas
Parker
SPUR 399
5 TEXAS
121 TEXAS
75
378
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Allen

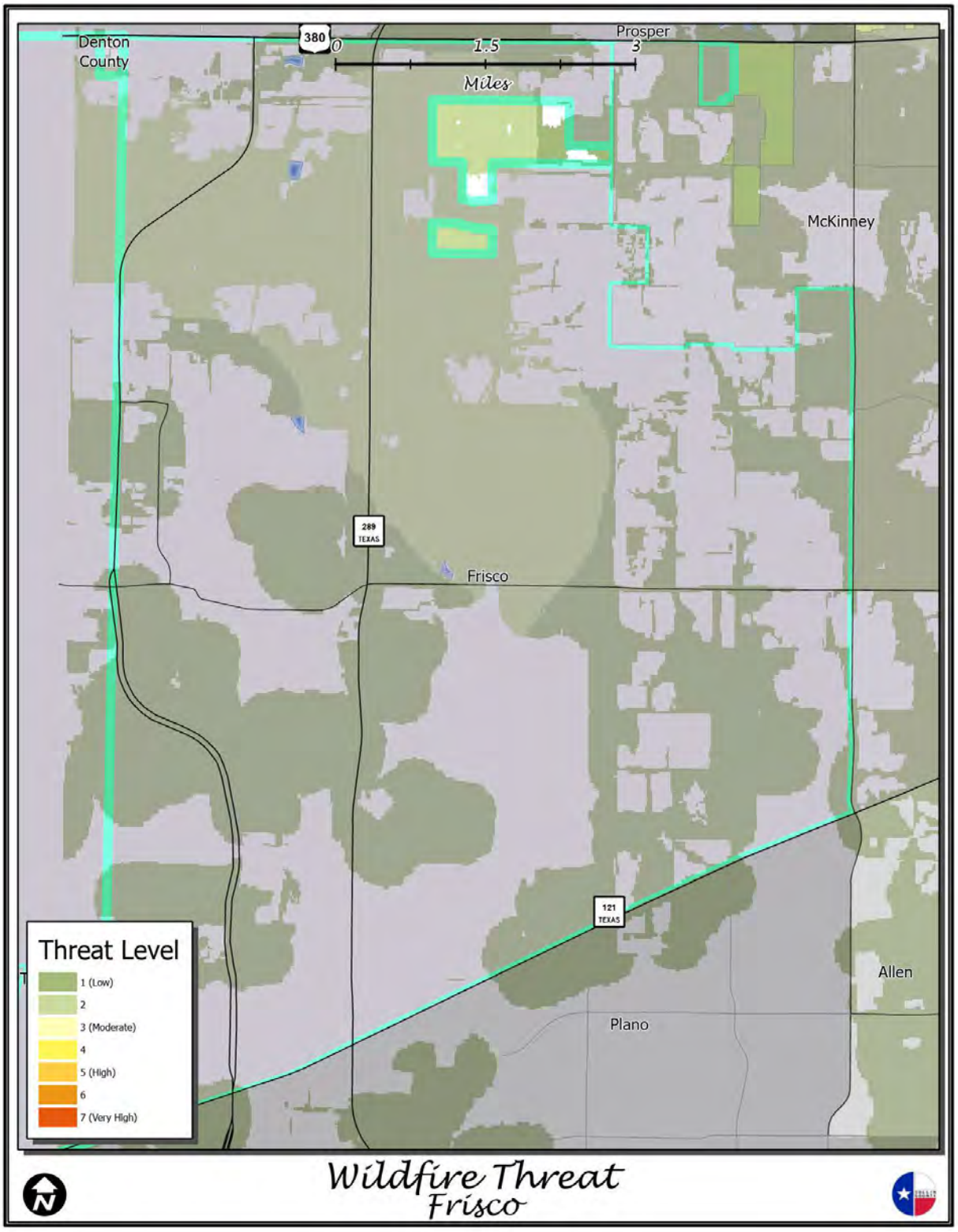

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Miles
Grayson County
Van Alstyne
Anna
Weston
Melissa
Princeton
Blue Ridge
75
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Anna

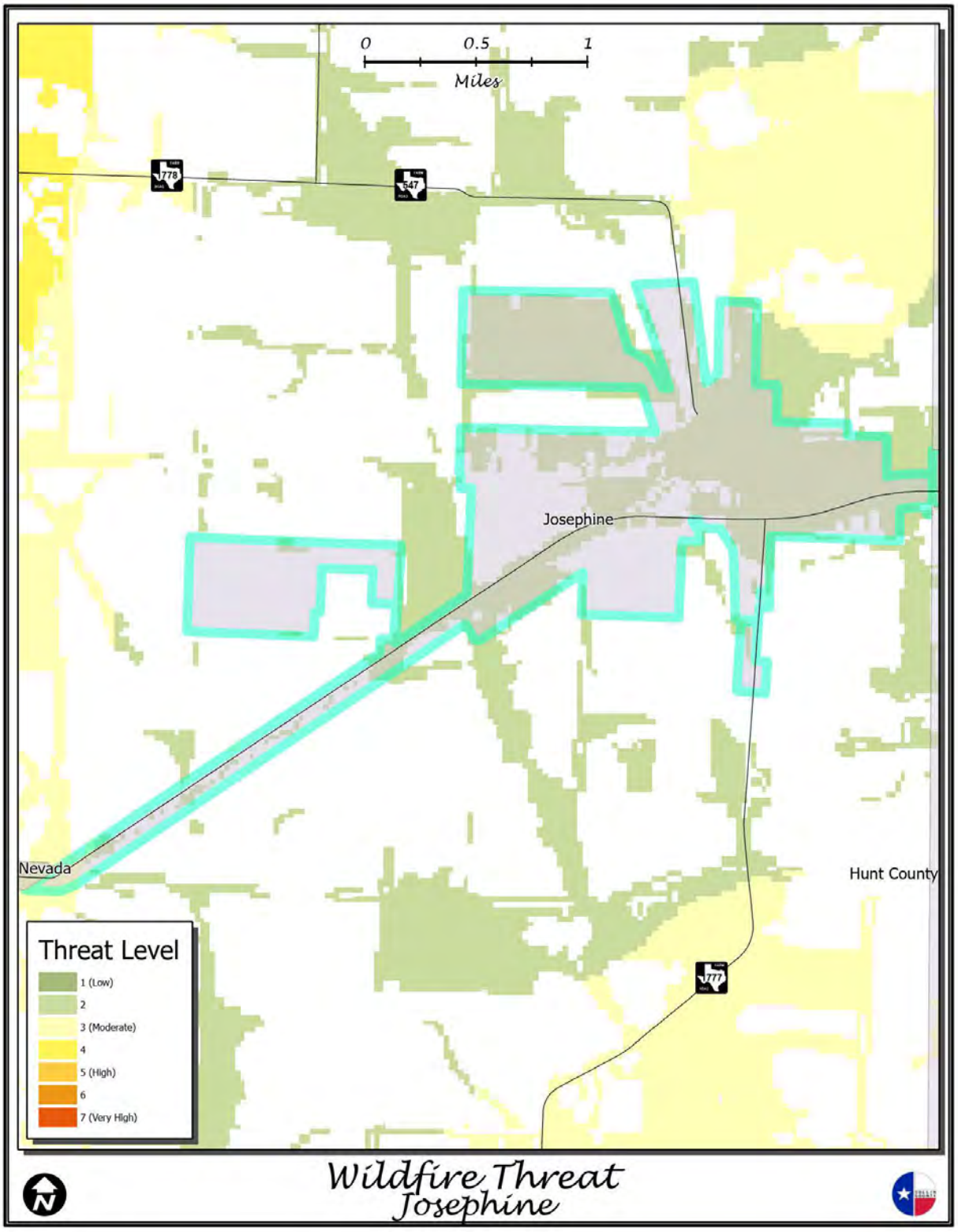

0
2
4
Miles
Trenton
Fannin County
Anna
Blue Ridge
Hunt County
Farmersville
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Blue Ridge

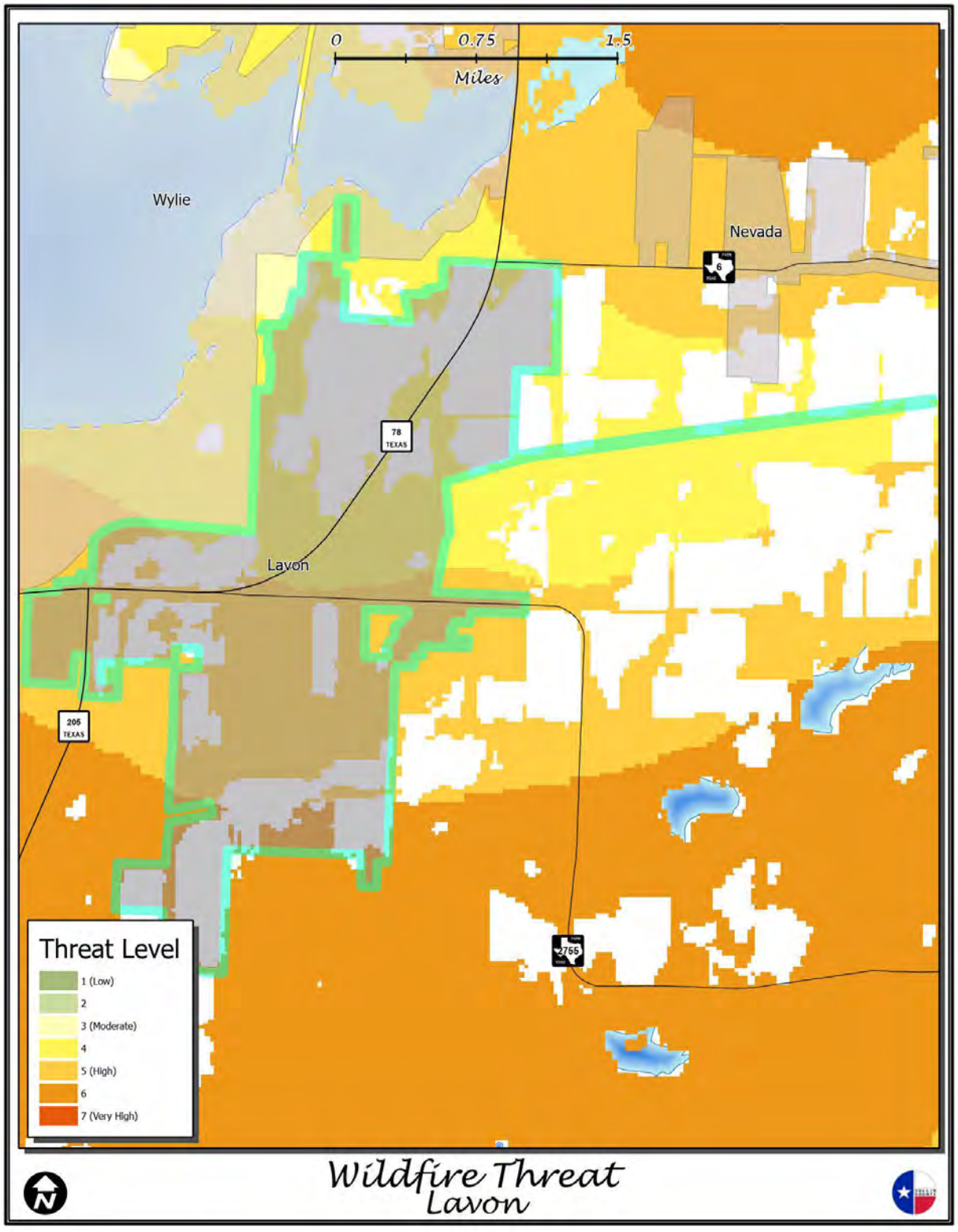

Gunter
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3
Miles
Grayson County
Pilot Point
Denton
County
289
C
455
289
TEXAS
455
Celina
428
478
McKinney
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Celina

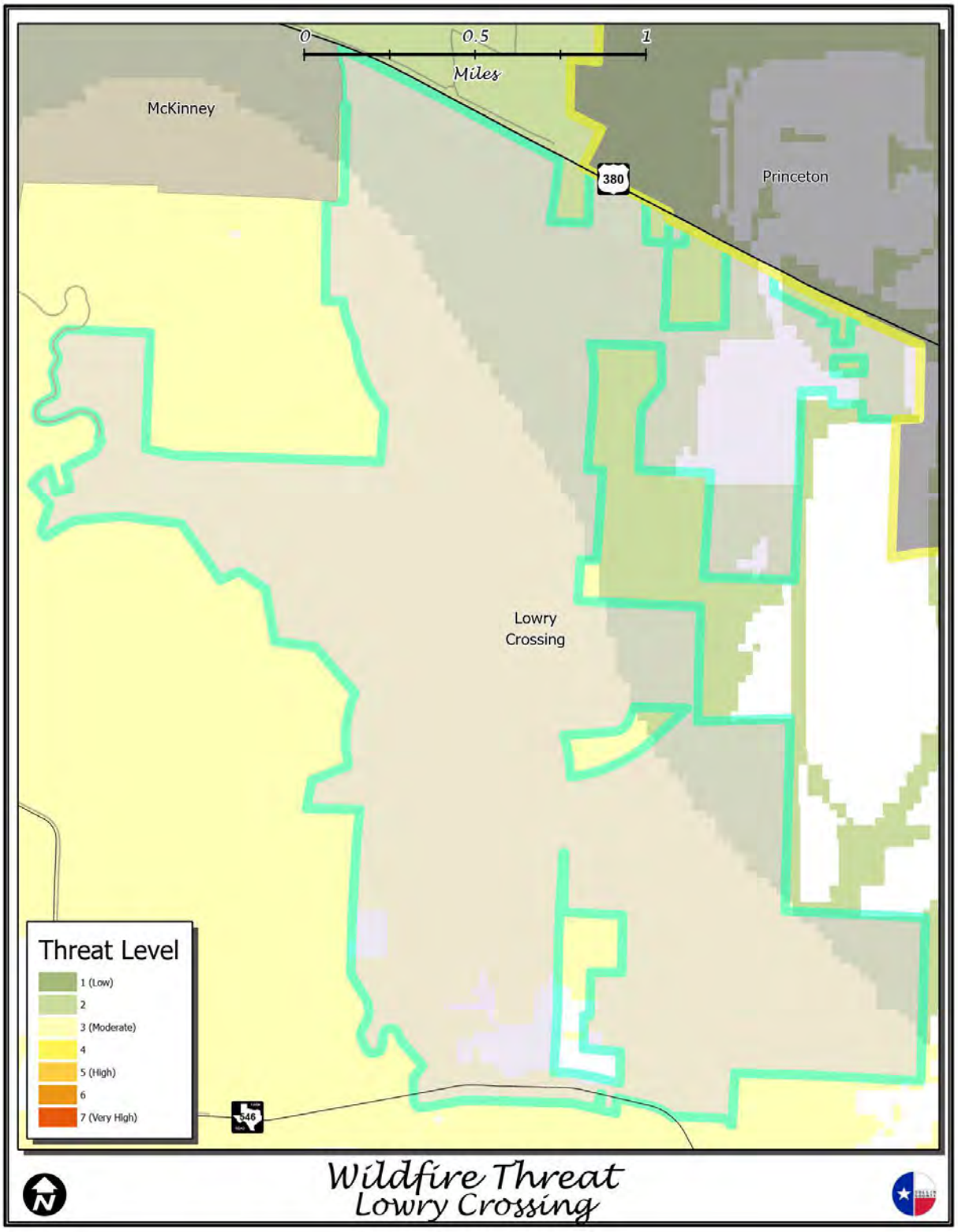

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2.5
Miles
380
5
TEXAS
75
McKinney
Lowry
Crossing
SPUR
399
546
121
TEXAS
Fairview
378
Allen
Lucas
Parker
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Fairview

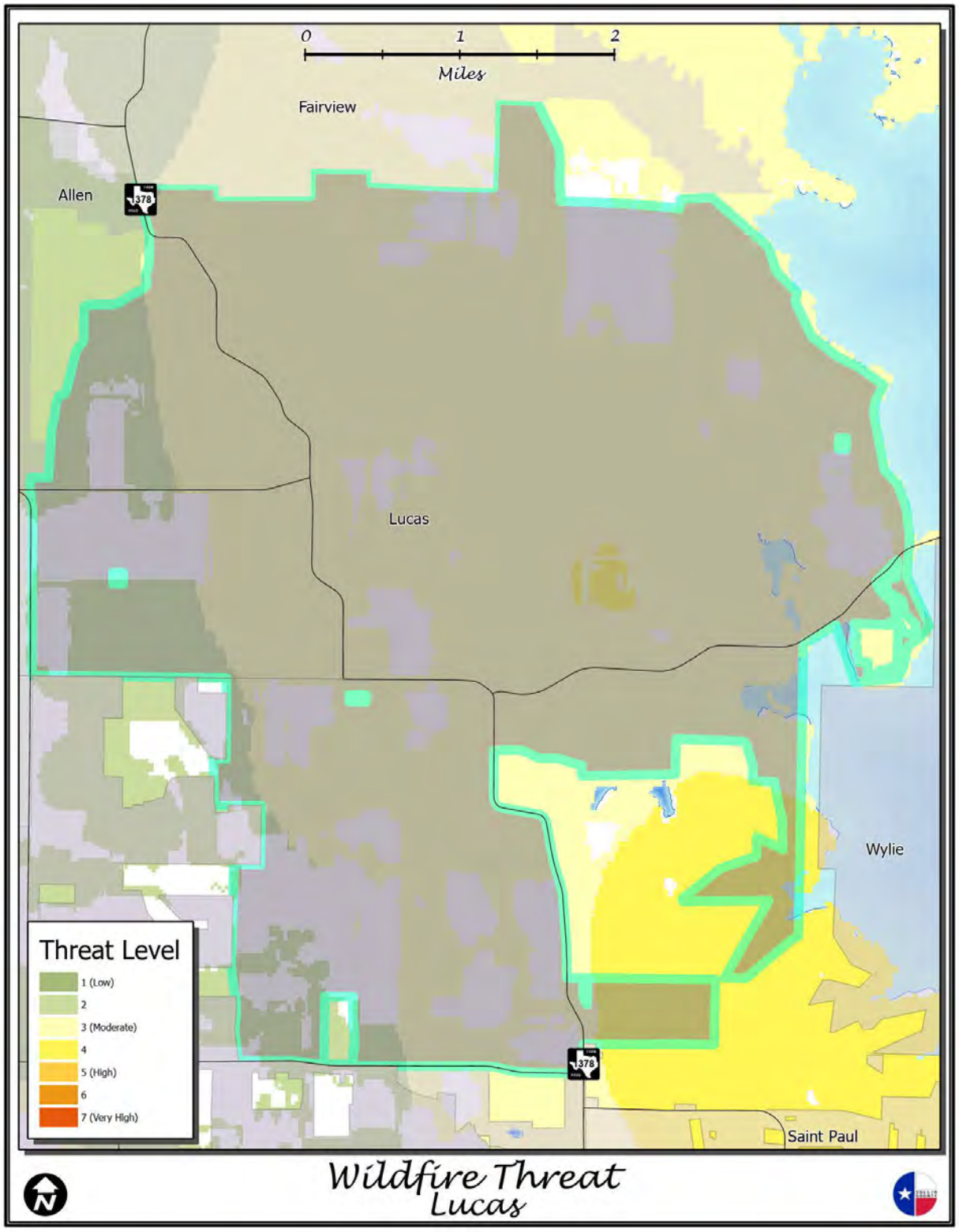

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Miles
Blue Ridge
2756
194
Business 78 E
Farmersville
Princeton
78 TEXAS
380
Hunt County
547
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Farmersville

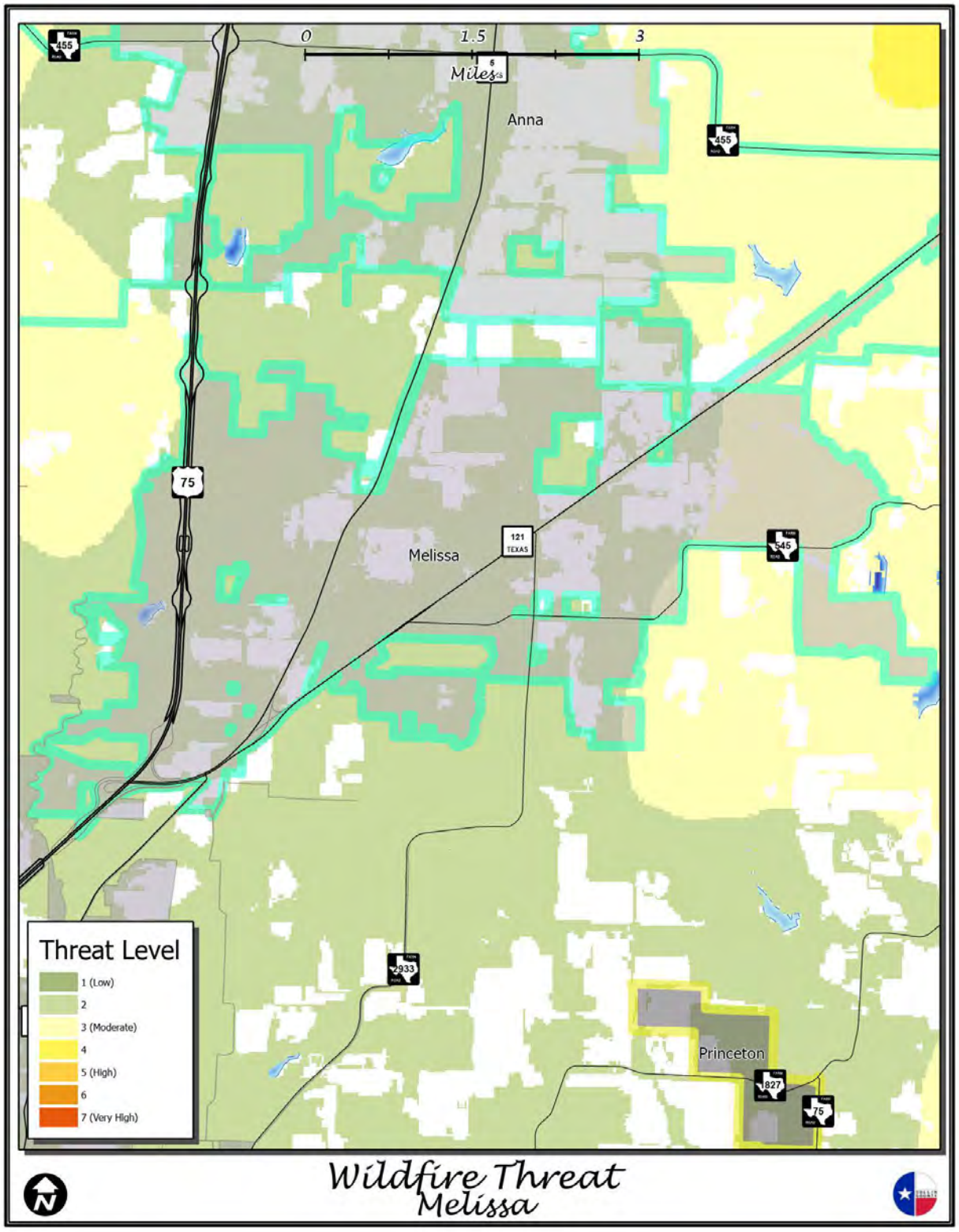

Denton County
380
0
1.5
3
Miles
Prosper
McKinney
289 TEXAS
Frisco
121 TEXAS
Allen
Plano
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Frisco

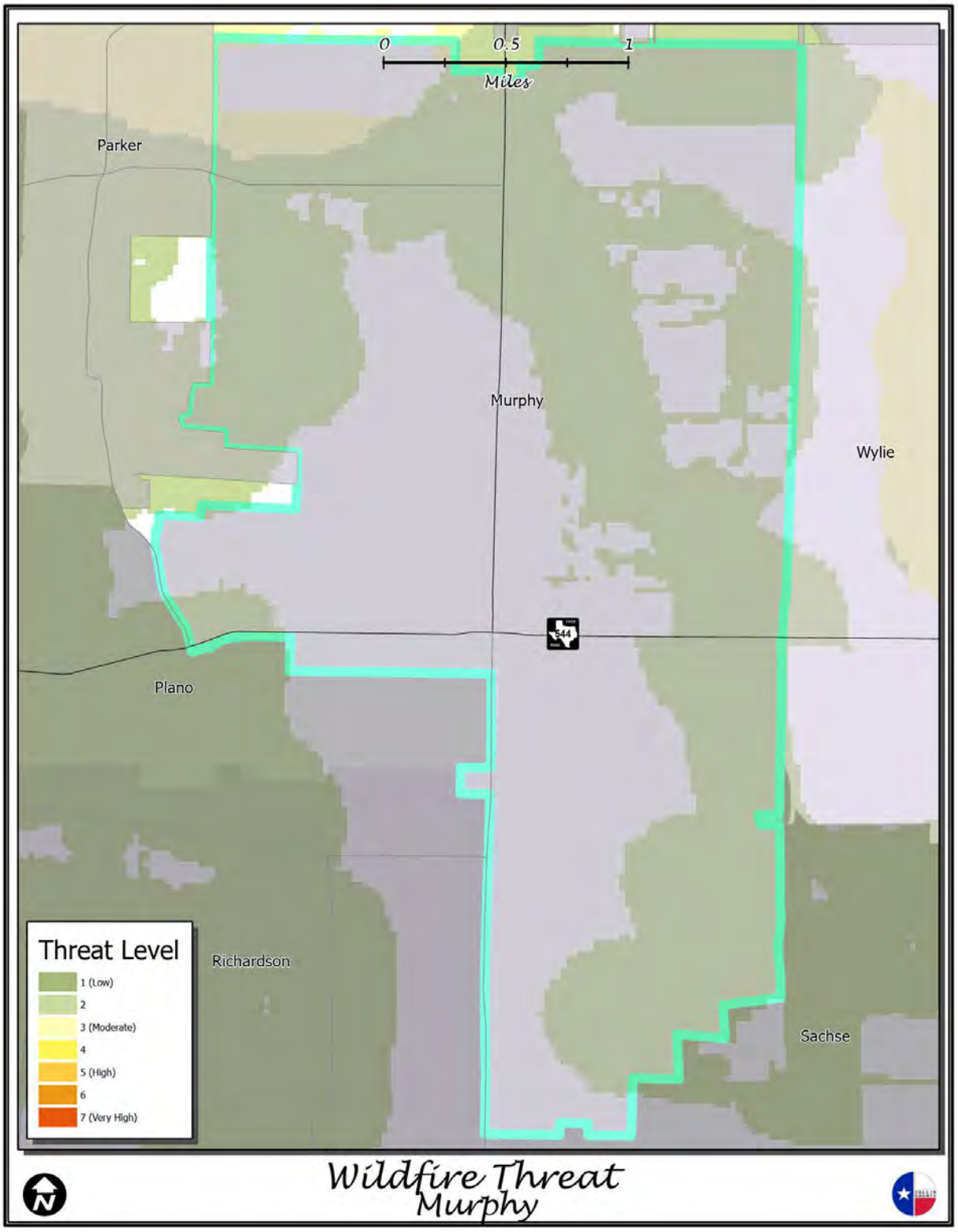

0
0.5
1
Miles
Josephine
Nevada
Hunt County
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Josephine

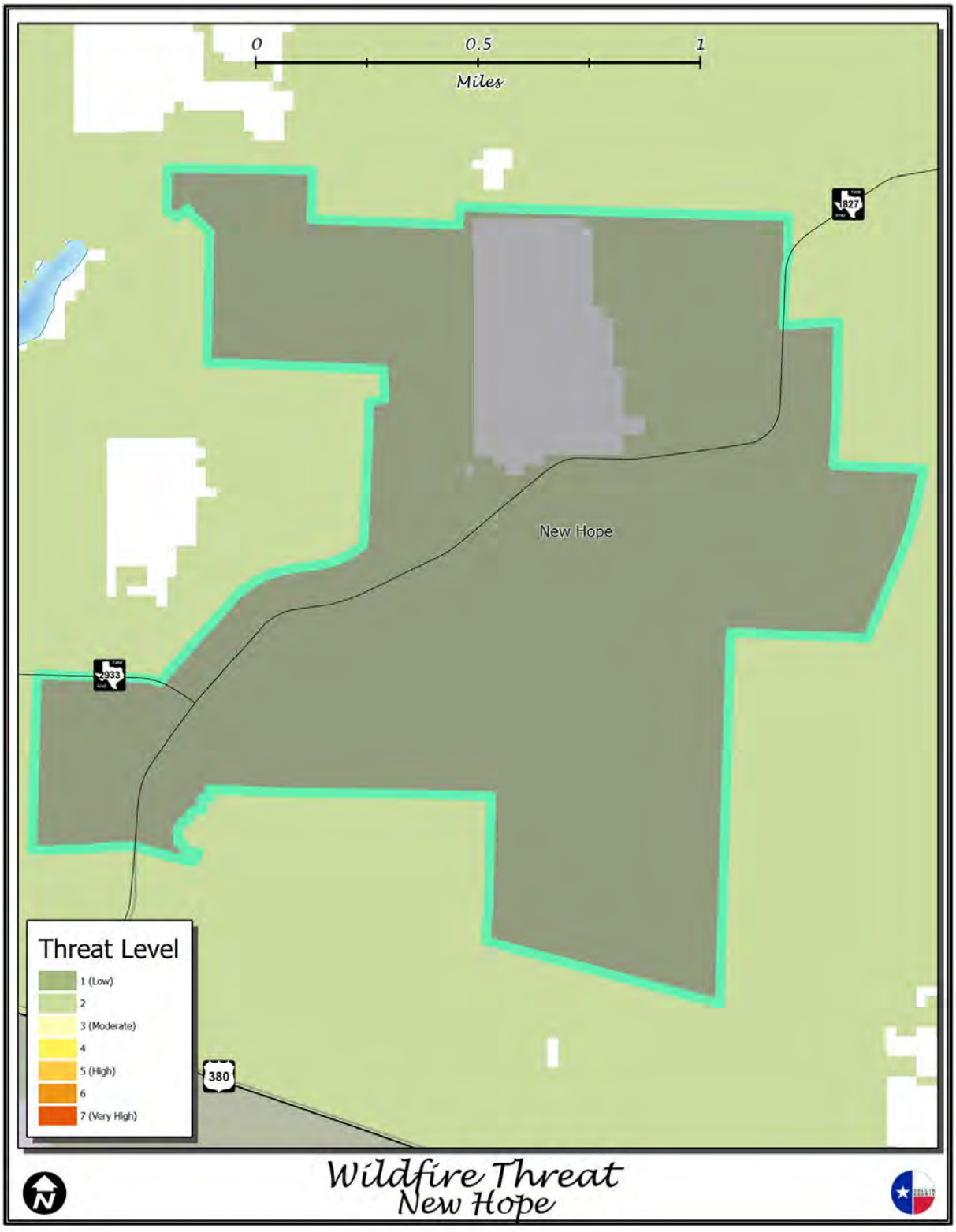

0
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1.5
Miles
Wylie
Nevada
6
78
TEXAS
Lavon
205
TEXAS
2755
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Lavon

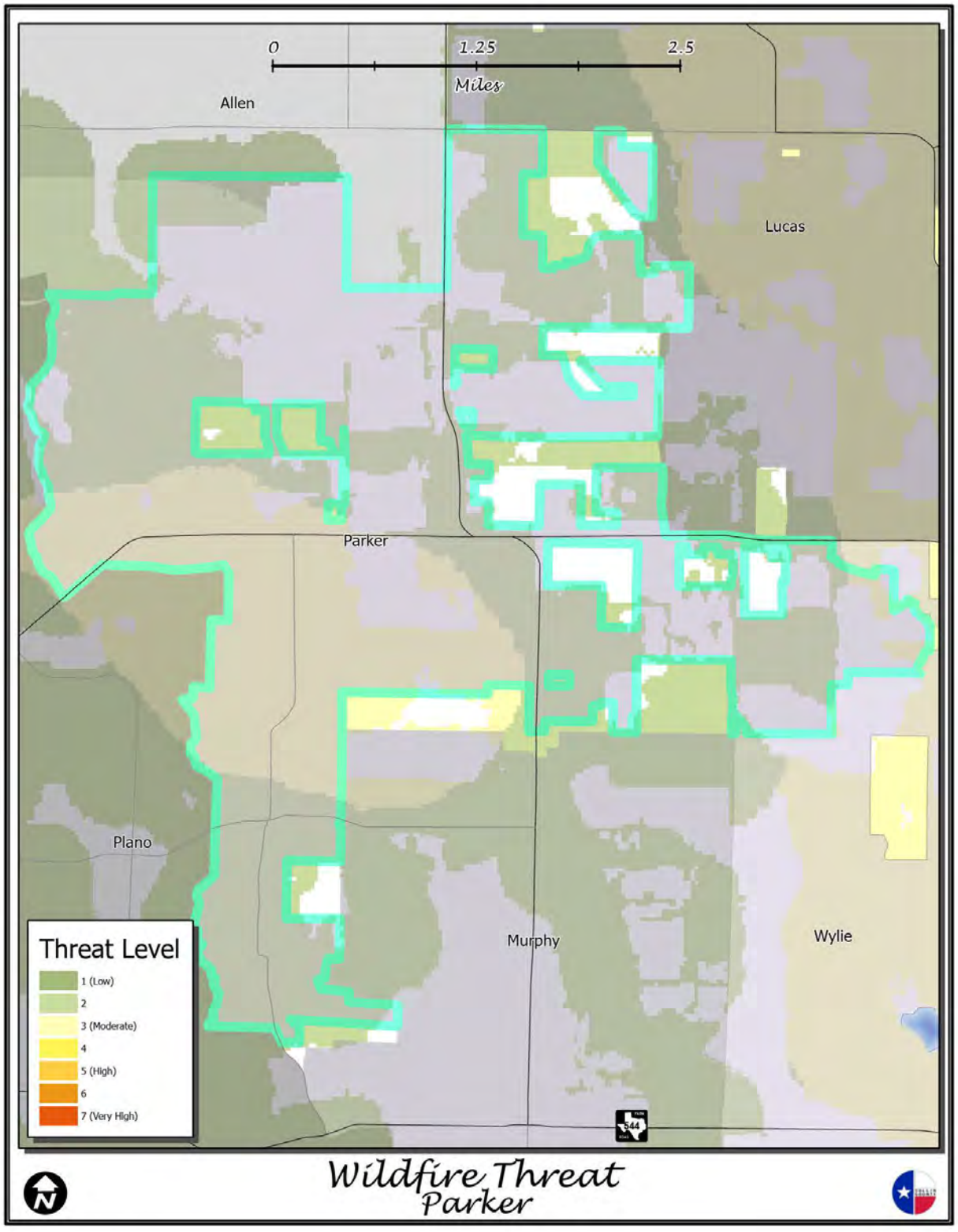

0
0.5
1
Miles
McKinney
380
Princeton
Lowry
Crossing
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
546
Wildfire Threat
Lowry Crossing

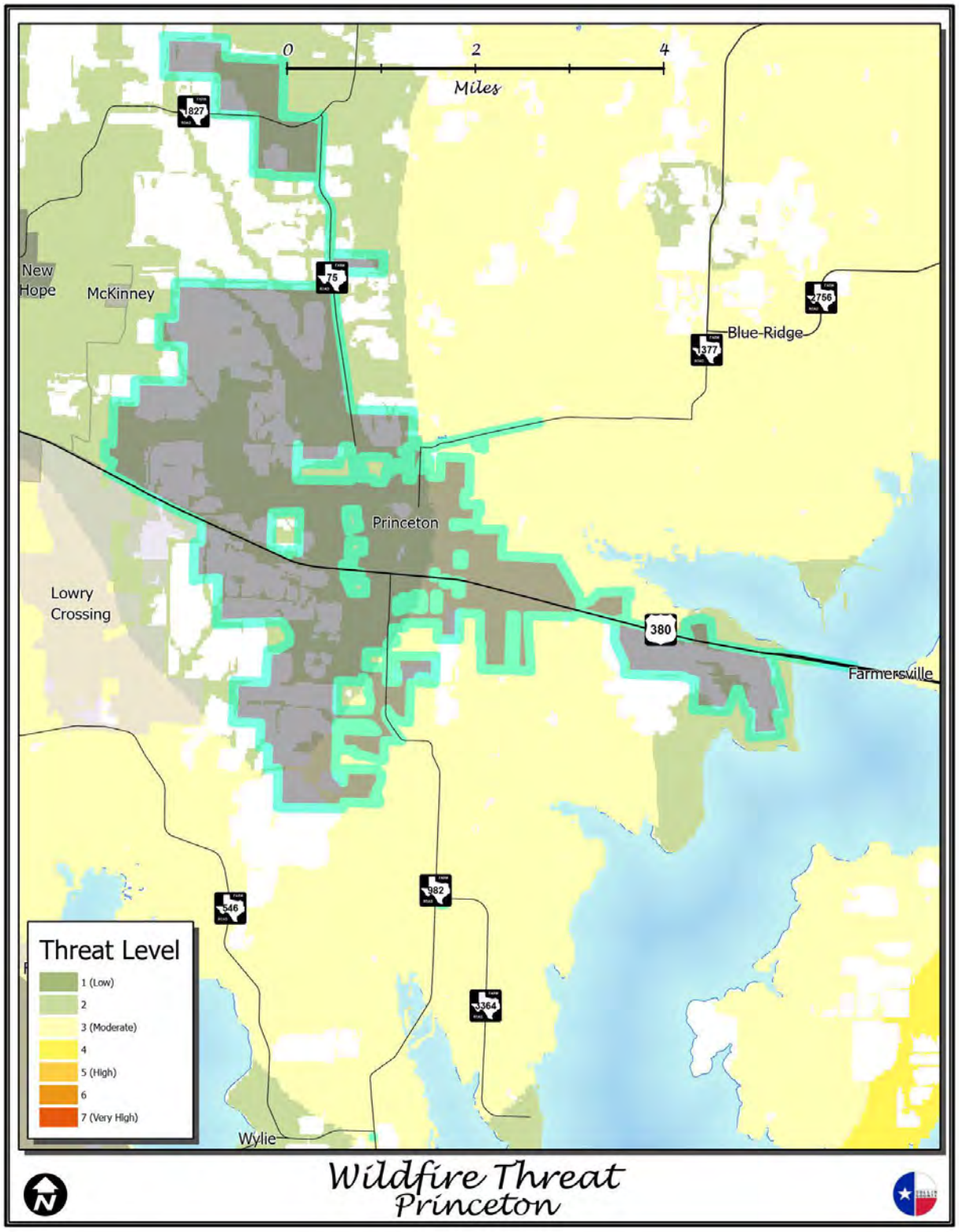

0
1
2
Miles
Fairview
Allen
378
Lucas
Wylie
Saint Paul
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Lucas

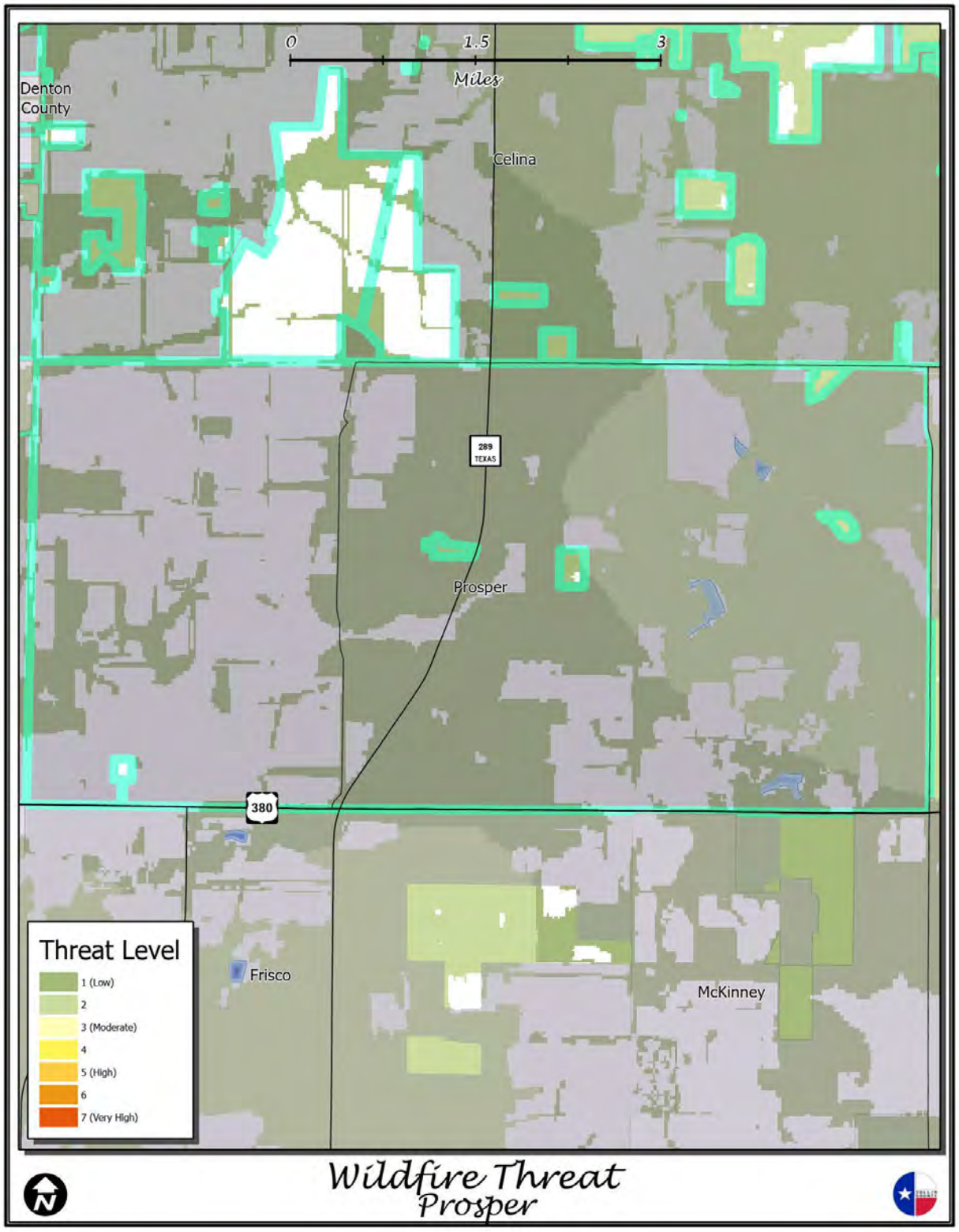

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1.5
3
Miles
Anna
Melissa
Princeton
75
121
TEXAS
455
545
933
1827
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Melissa

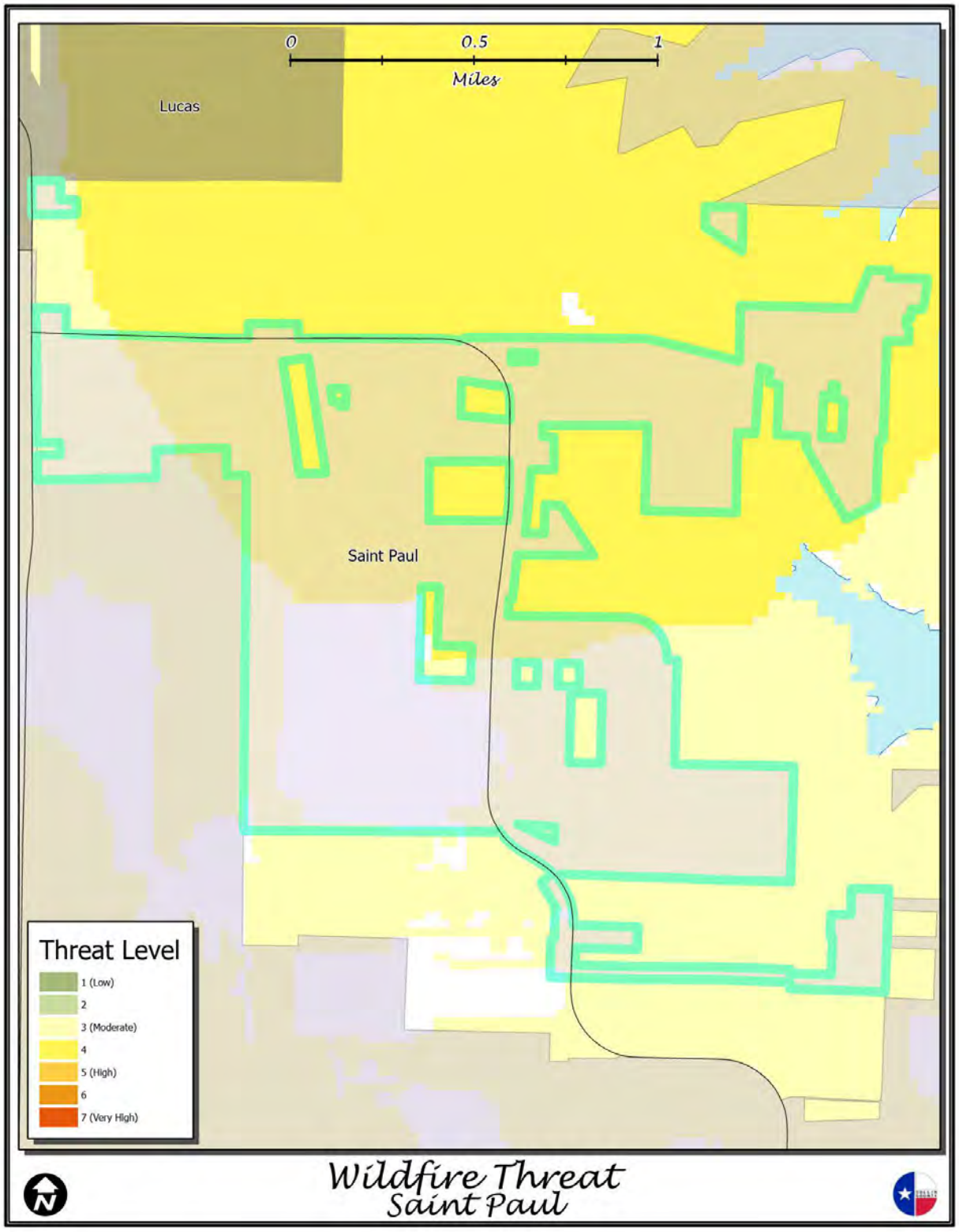

0
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1
Miles
Parker
Murphy
Wylie
544
Plano
Richardson
Sachse
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Murphy

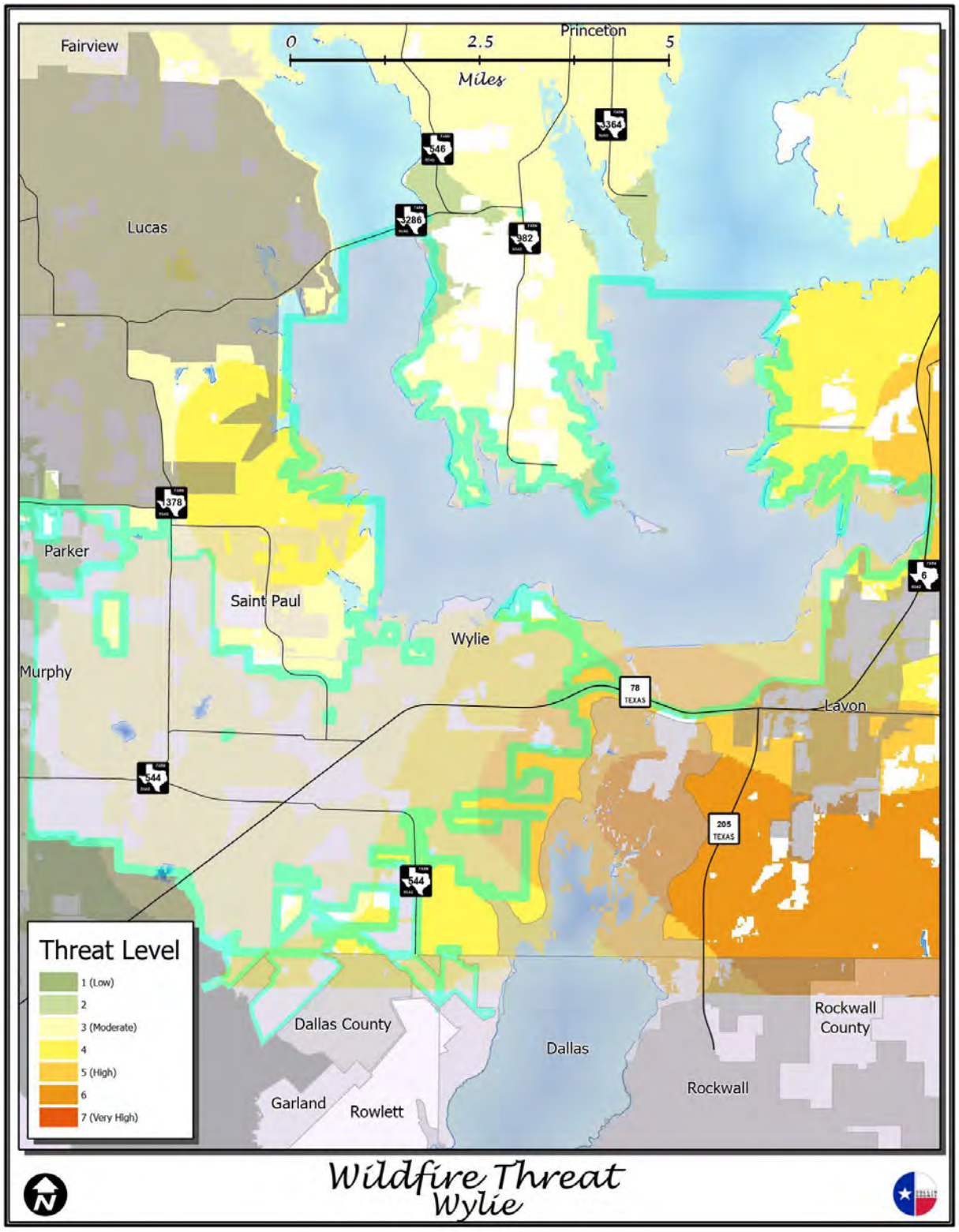

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1
Miles
New Hope
827
2933
380
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
New Hope


0
1.25
2.5
Miles
Allen
Lucas
Parker
Plano
Murphy
Wylie
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
544
Wildfire Threat
Parker

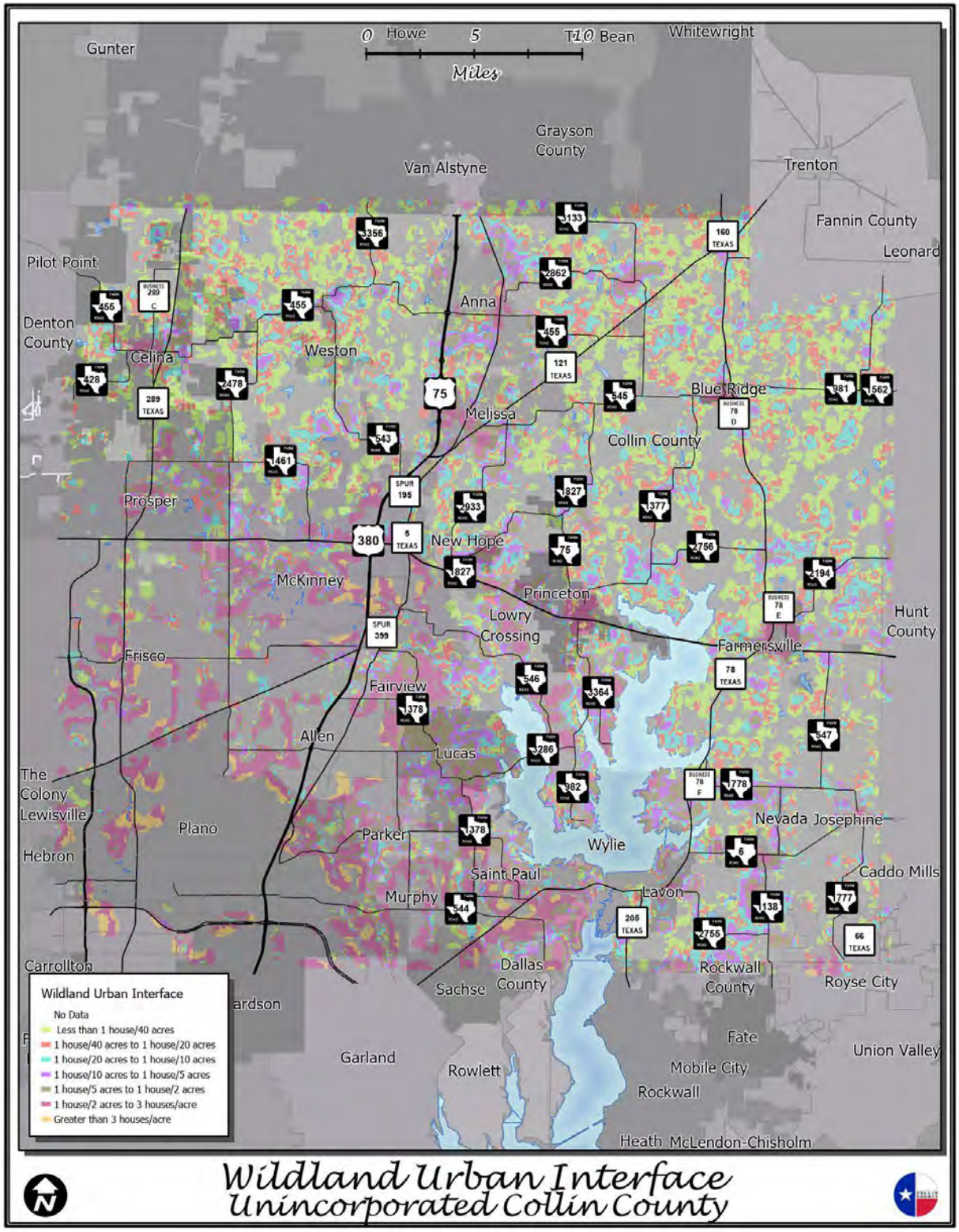

0
2
4
Miles
827
New Hope
McKinney
75
756
Blue-Ridge
877
Princeton
Lowry Crossing
380
Farmersville
982
546
364
Threat Level
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2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wylie
Wildfire Threat
Princeton

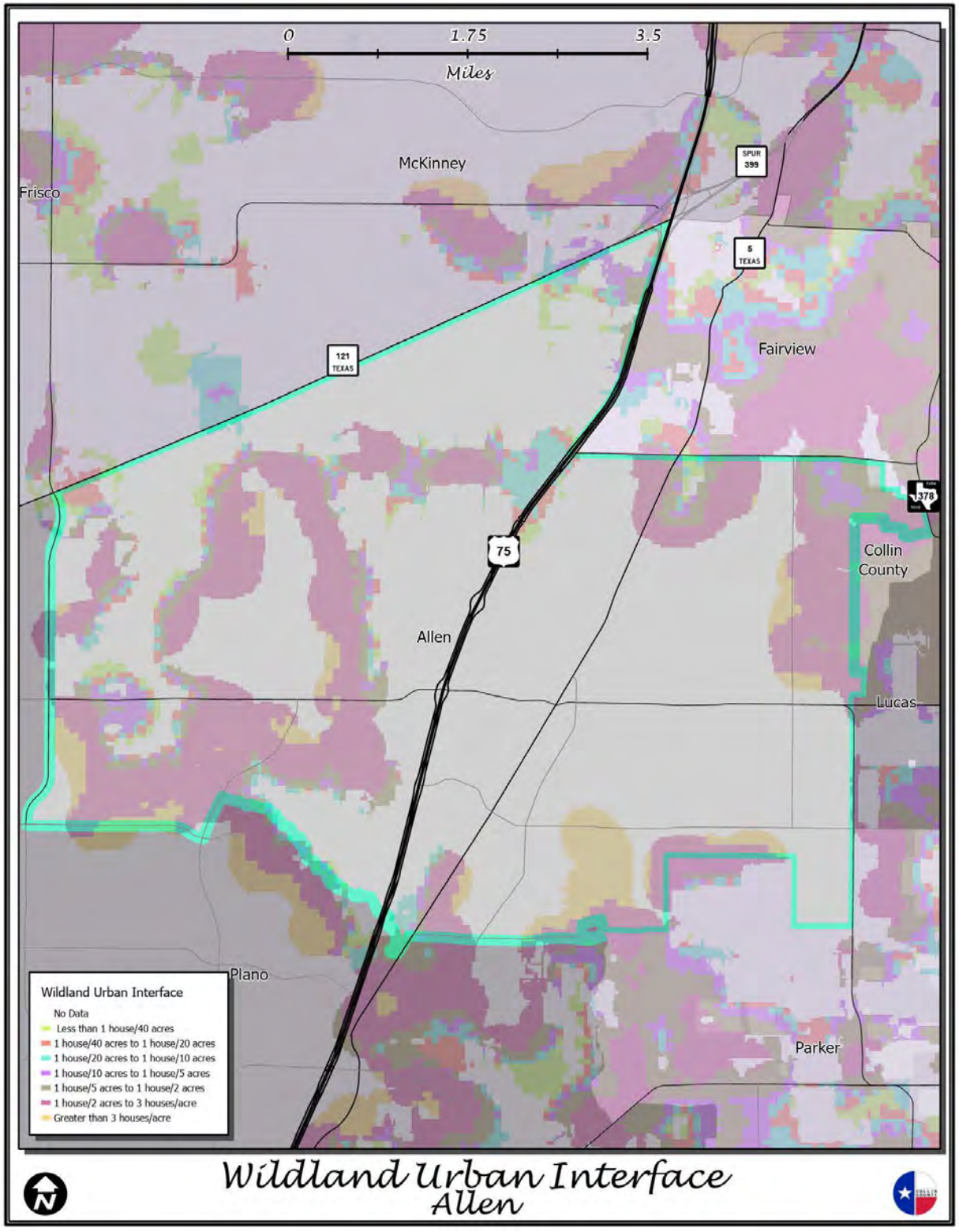

0
1.5
3
Miles
Denton County
Celina
289
TEXAS
Prosper
380
Frisco
McKinney
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Prosper

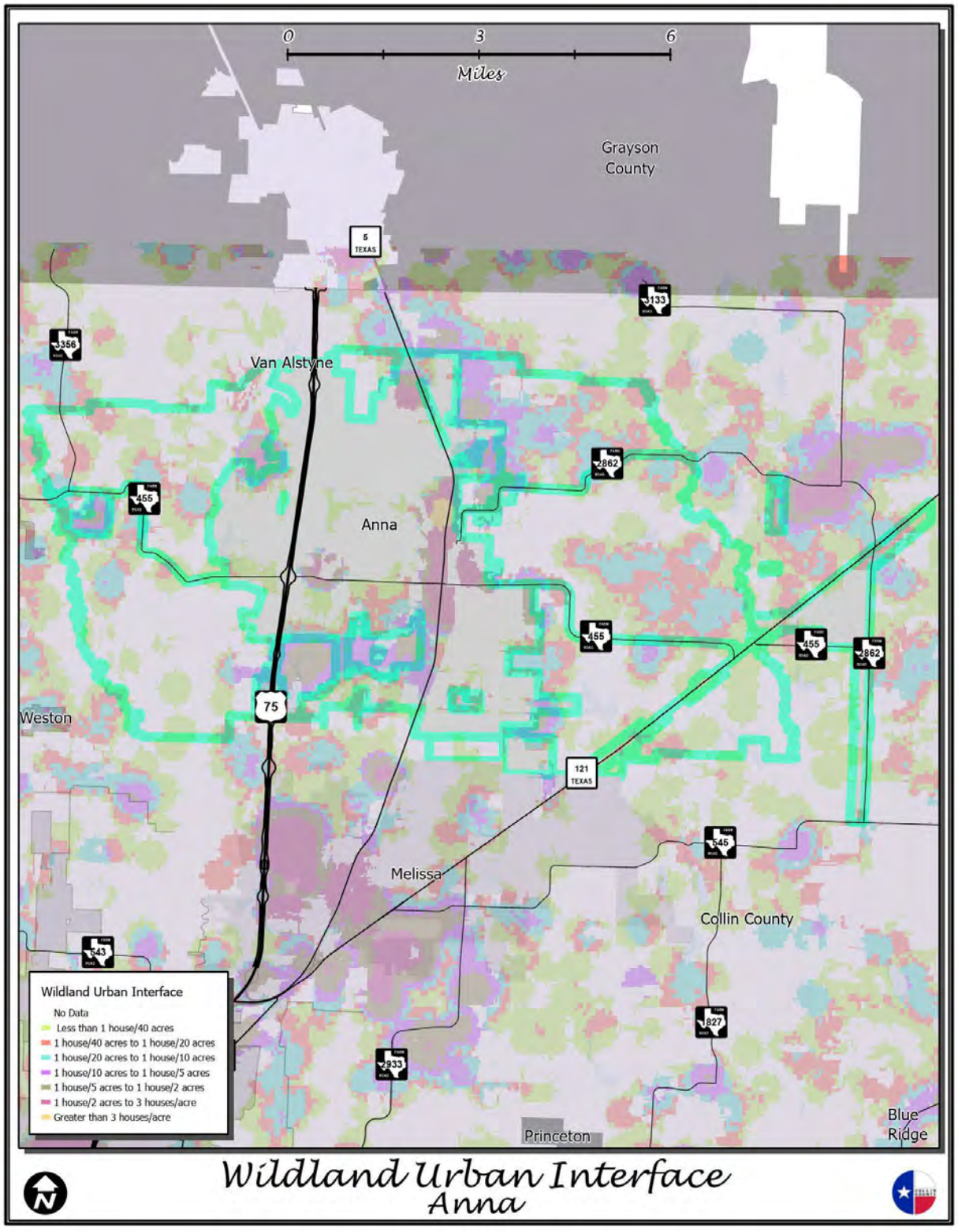

0
0.5
1
Miles
Lucas
Saint Paul
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Saint Paul

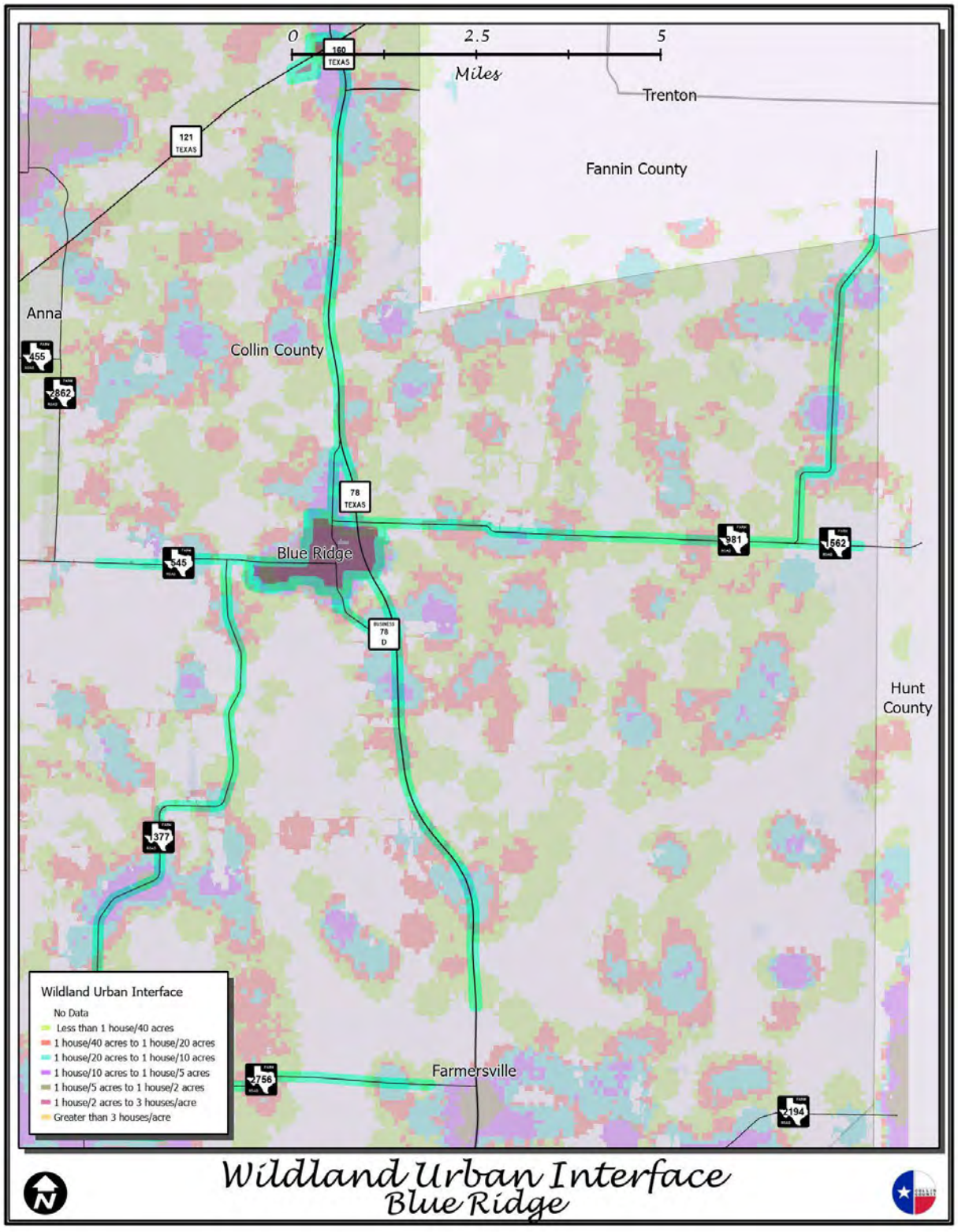

Fairview
0
2.5
5
Miles
Princeton
Lucas
Parker
Saint Paul
Wylie
Murphy
Lavon
Dallas County
Dallas
Rockwall County
Rockwall
Garland
Rowlett
Threat Level
1 (Low)
2
3 (Moderate)
4
5 (High)
6
7 (Very High)
Wildfire Threat
Wylie

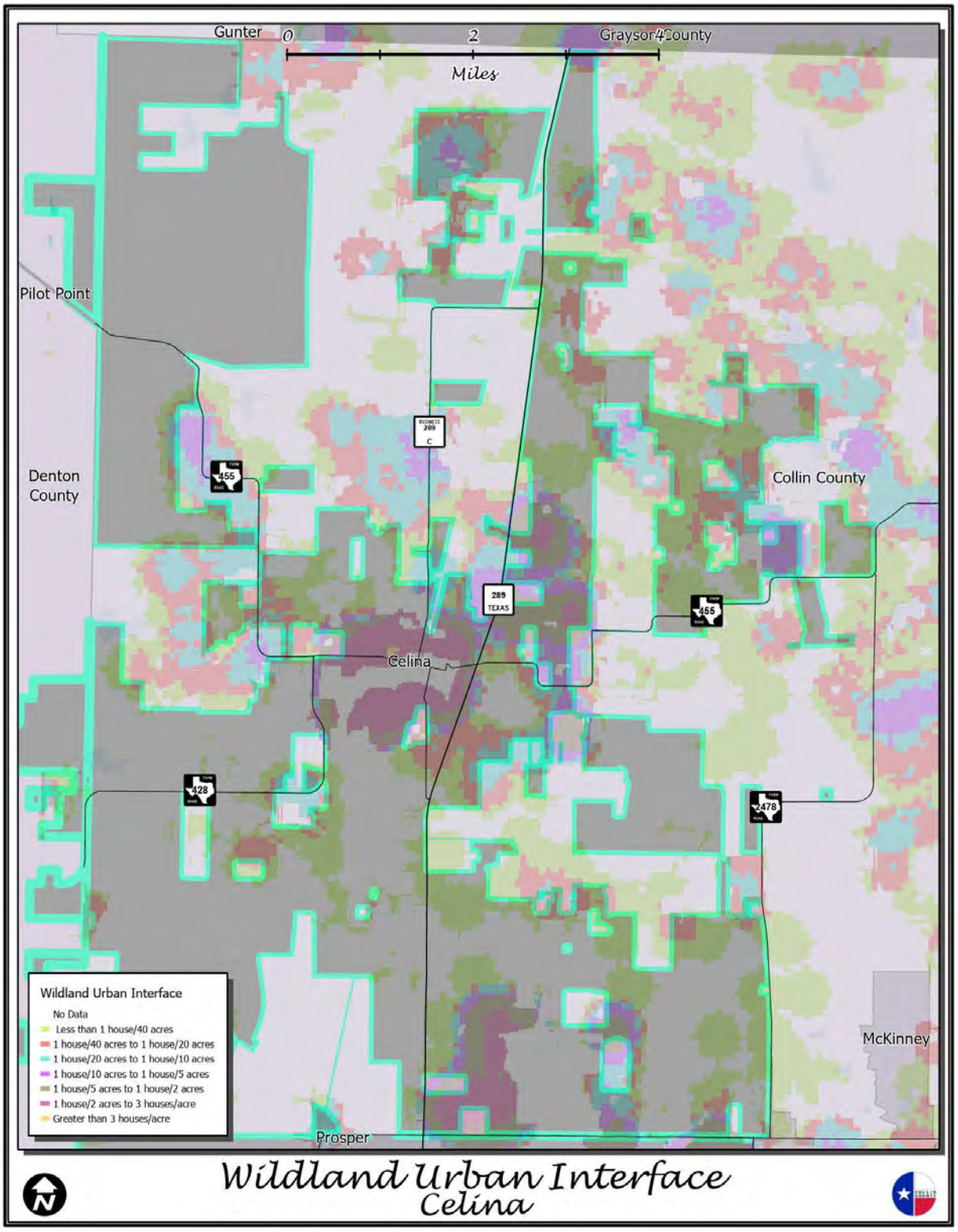
Map Series F – Wildland Urban Interface

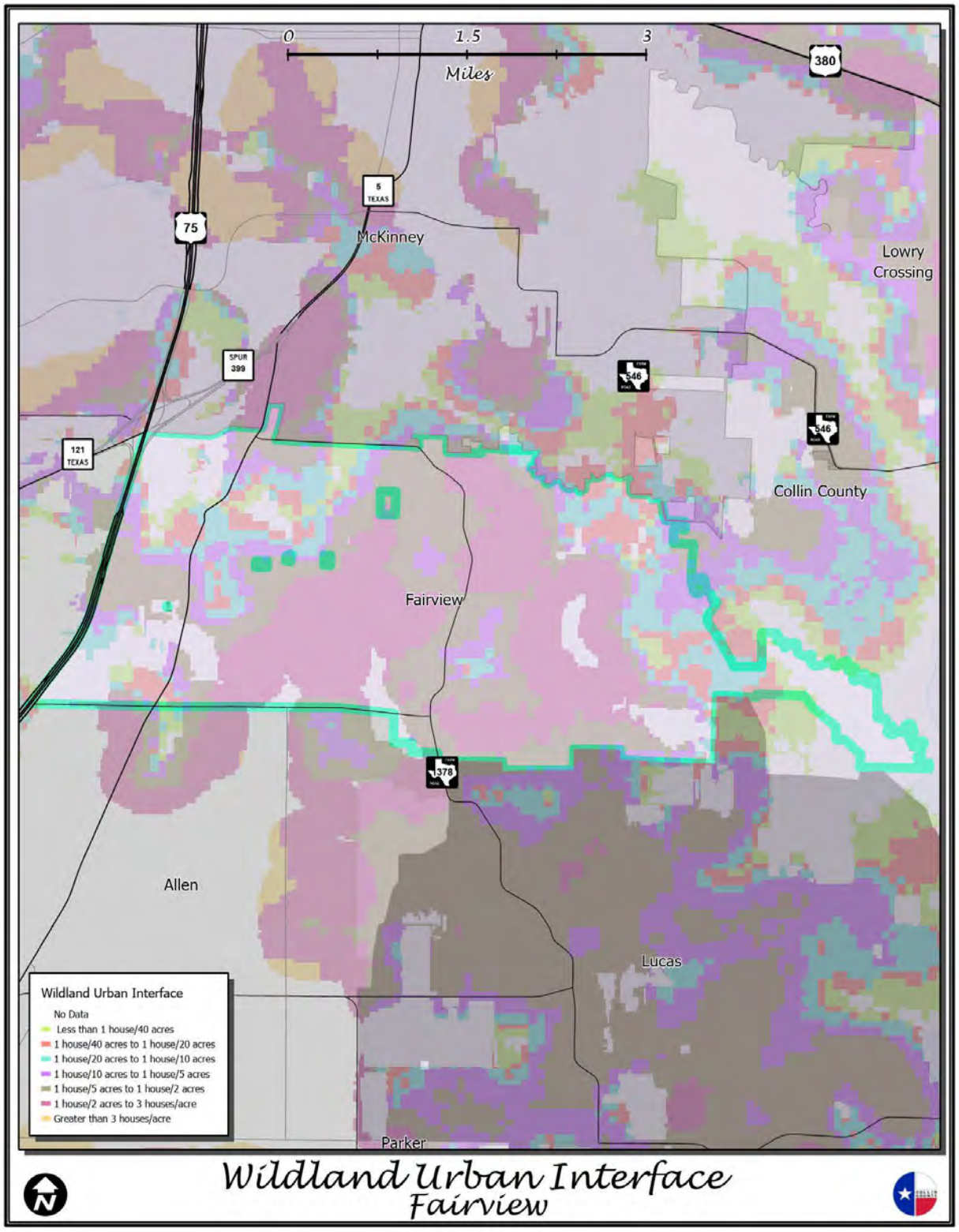


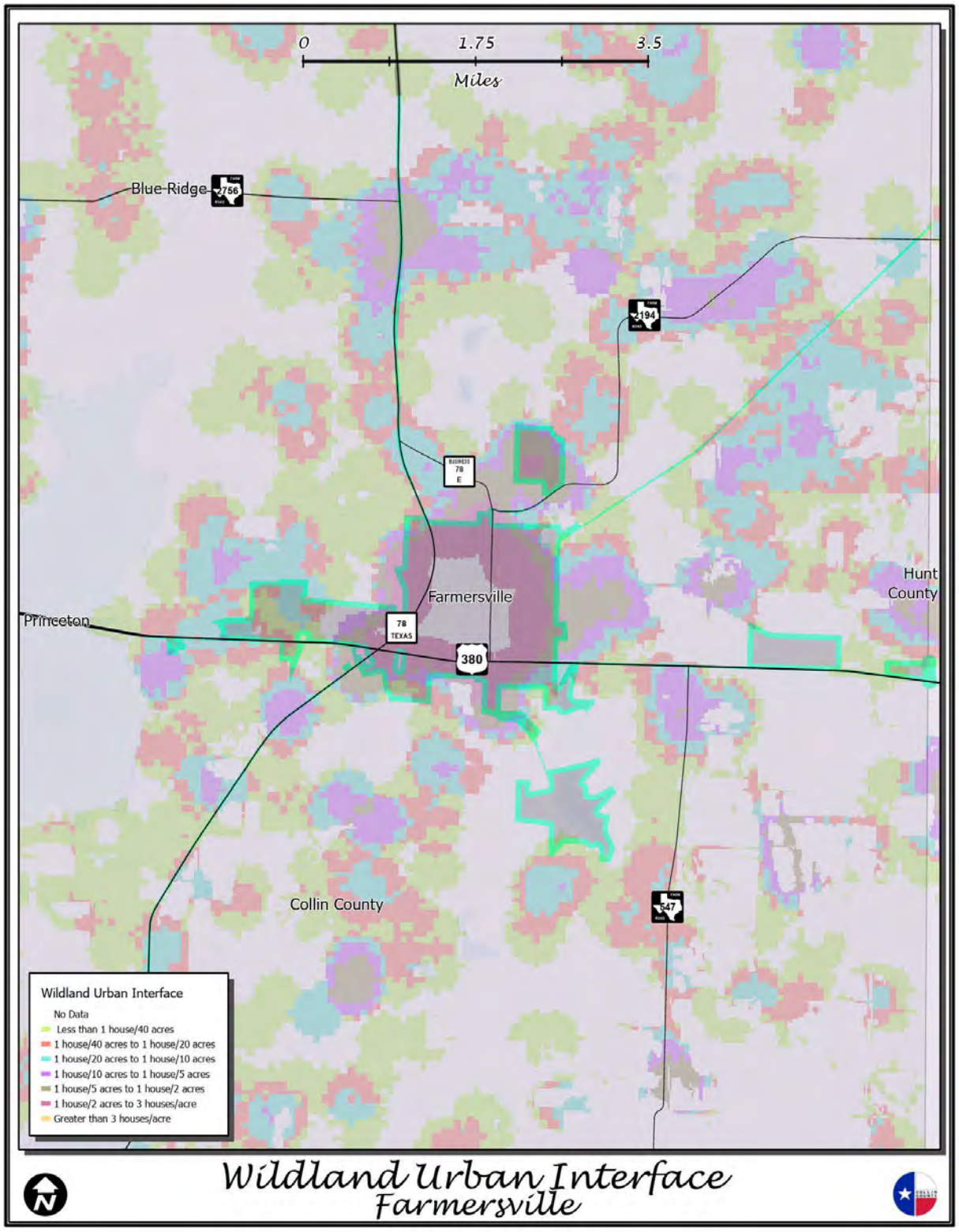

0
1.75
3.5
Miles
McKinney
Frisco
SPUR 399
5 TEXAS
121 TEXAS
Fairview
378
75
Collin County
Allen
Lucas
Plano
Parker
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Allen

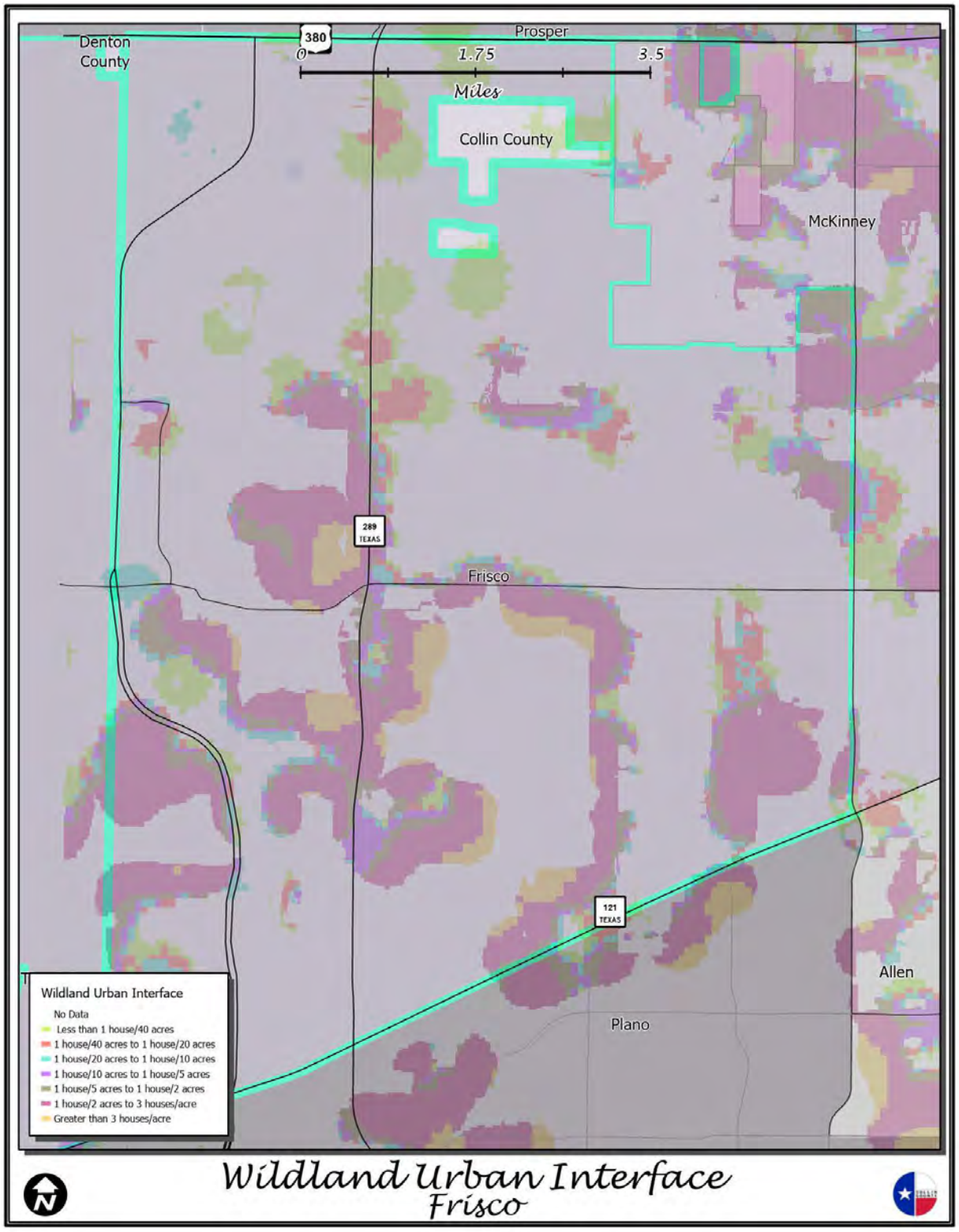

0
3
6
Miles
Grayson County
Van Alstyne
Anna
Weston
Melissa
Collin County
Princeton
Blue Ridge
75
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Anna

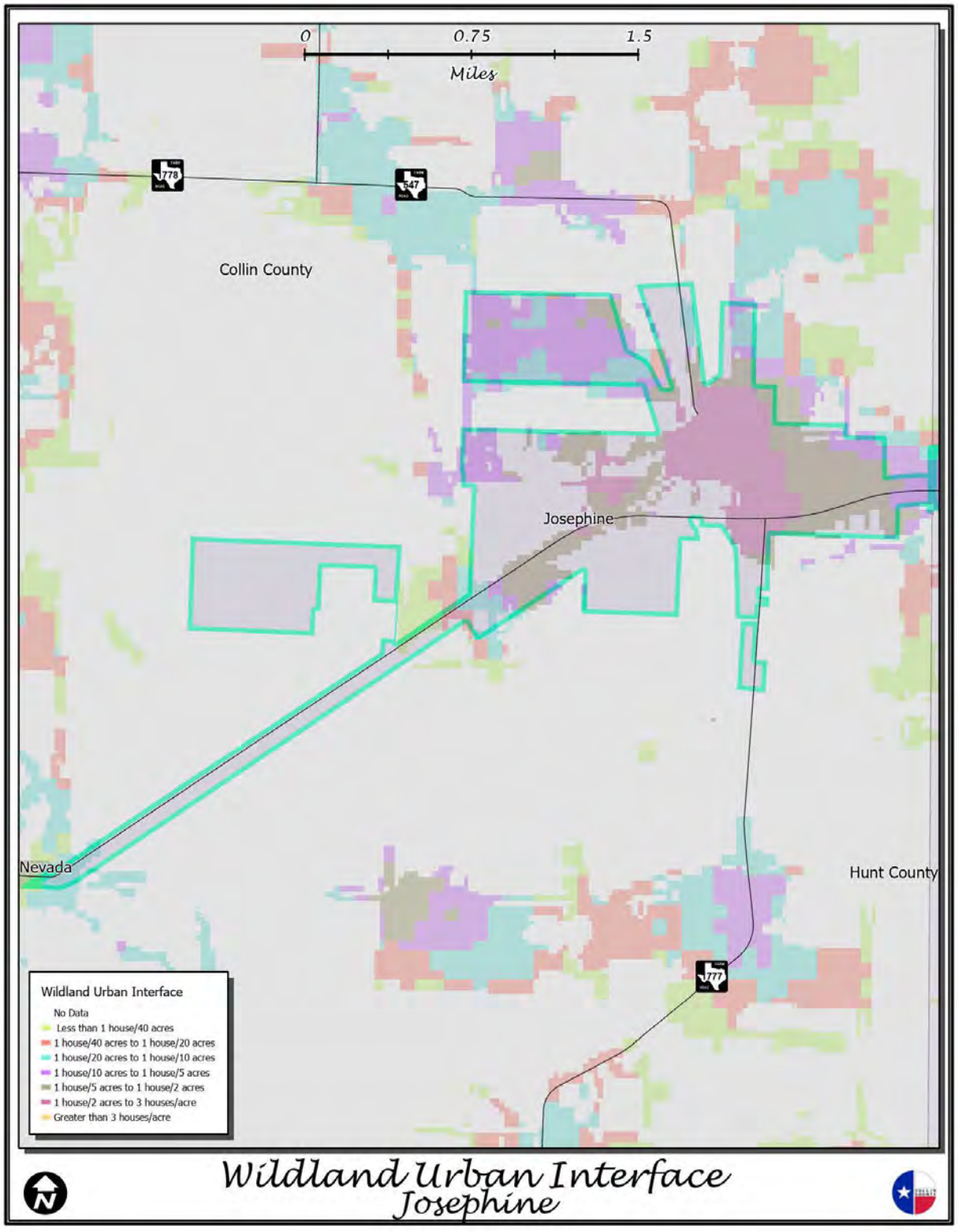

0
2.5
5
Miles
Trenton
Fannin County
Anna
Collin County
Blue Ridge
Hunt County
Farmersville
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Blue Ridge

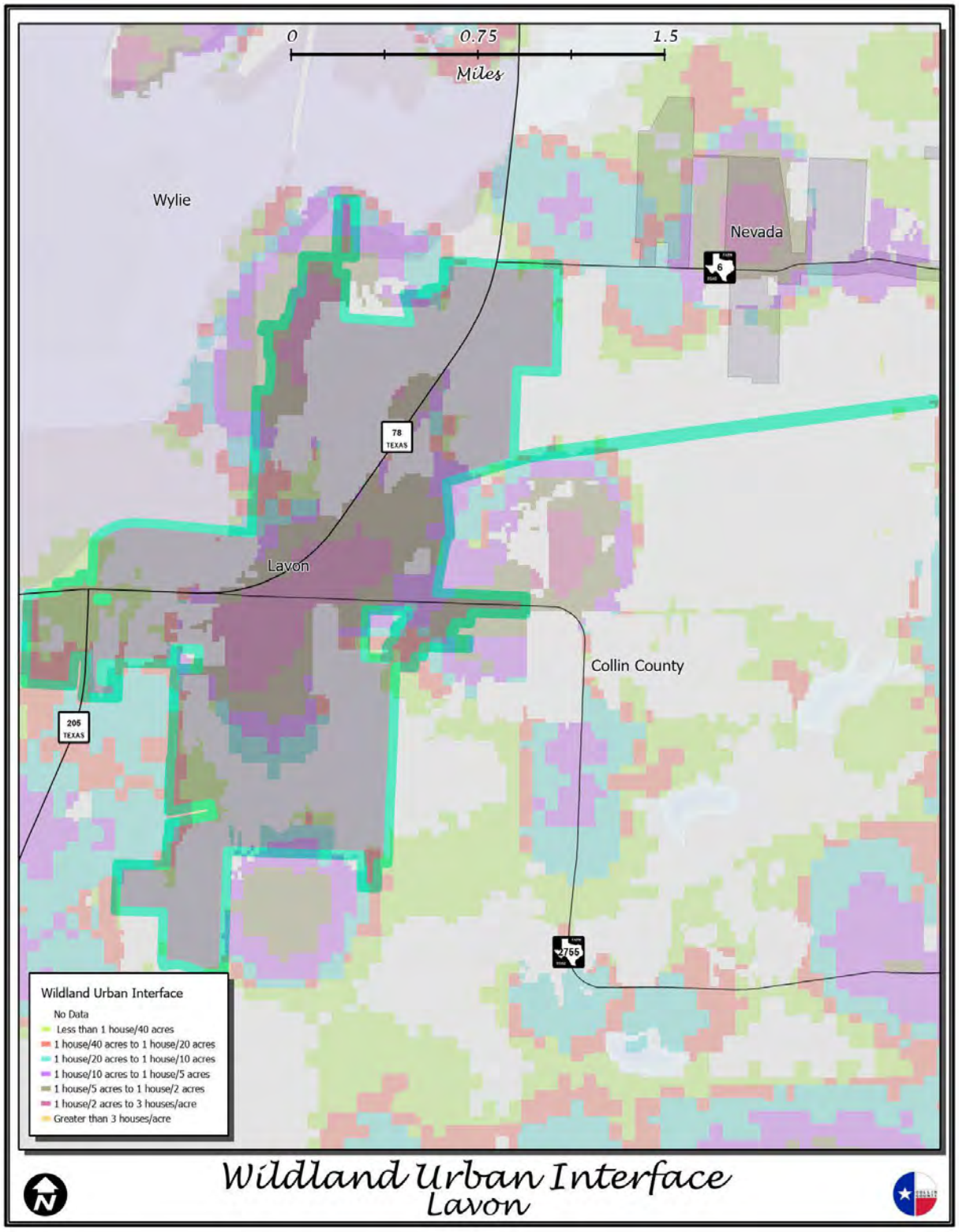

Gunter
0
2
Miles
Grayson County
Pilot Point
Denton County
Collin County
289 TEXAS
455
428
478
Celina
McKinney
Prosper
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Celina

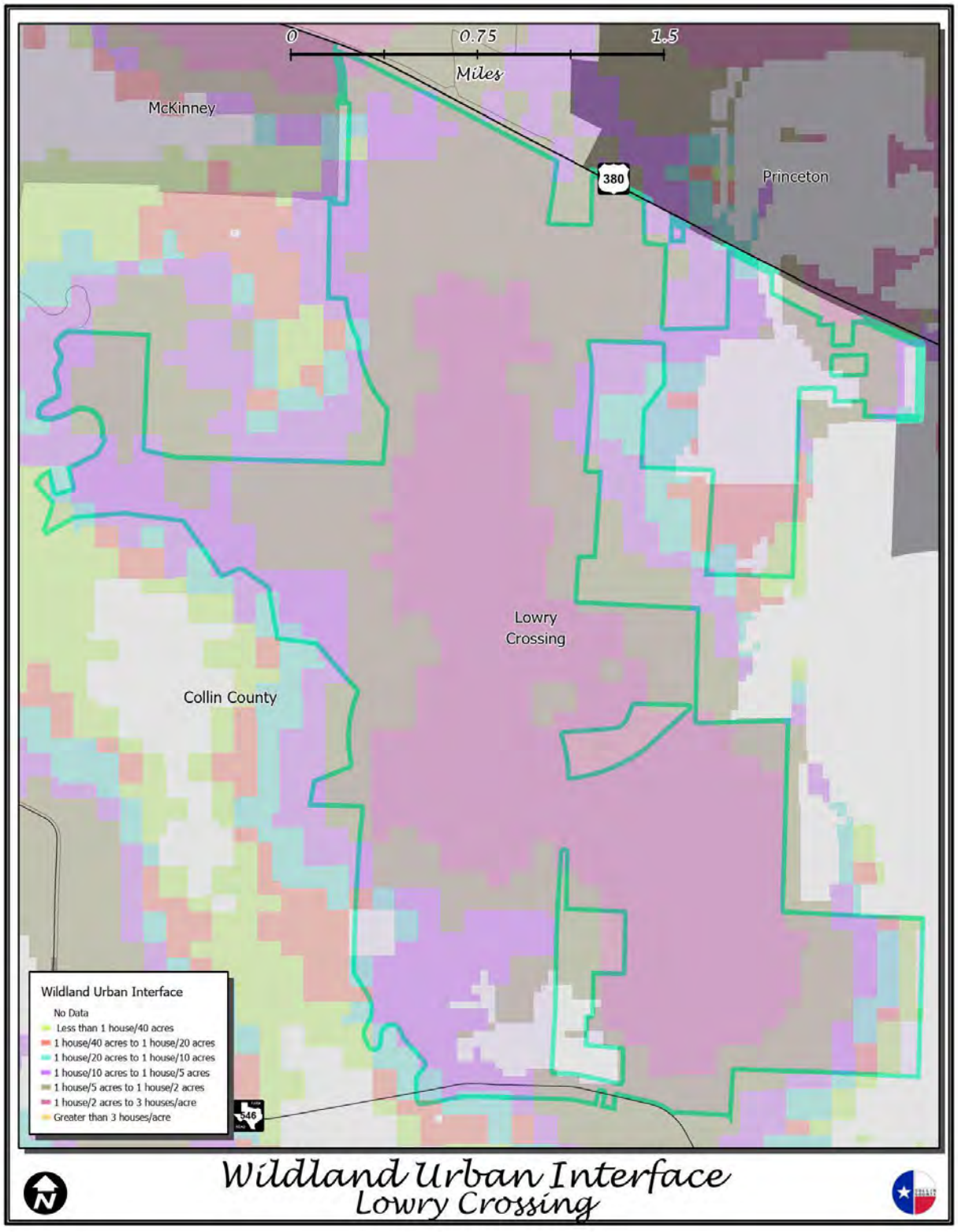

0
1.5
3
Miles
380
5
TEXAS
75
McKinney
Lowry
Crossing
SPUR
399
546
546
121
TEXAS
Collin County
Fairview
578
Allen
Lucas
Parker
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Fairview

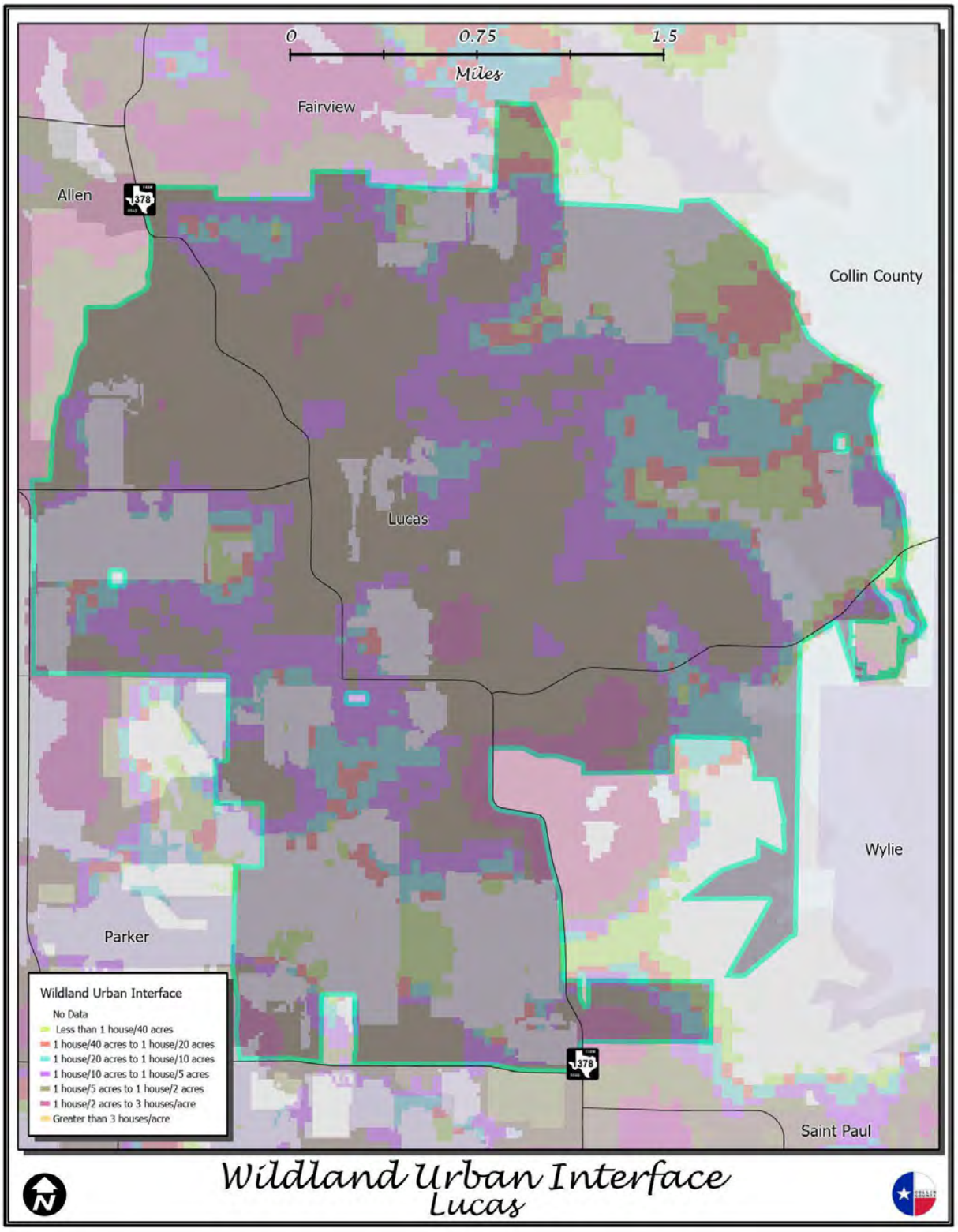

0
1.75
3.5
Miles
Blue Ridge
2756
194
Business 78 E
Farmersville
Princeton
78 Texas
380
Hunt County
Collin County
547
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Farmersville

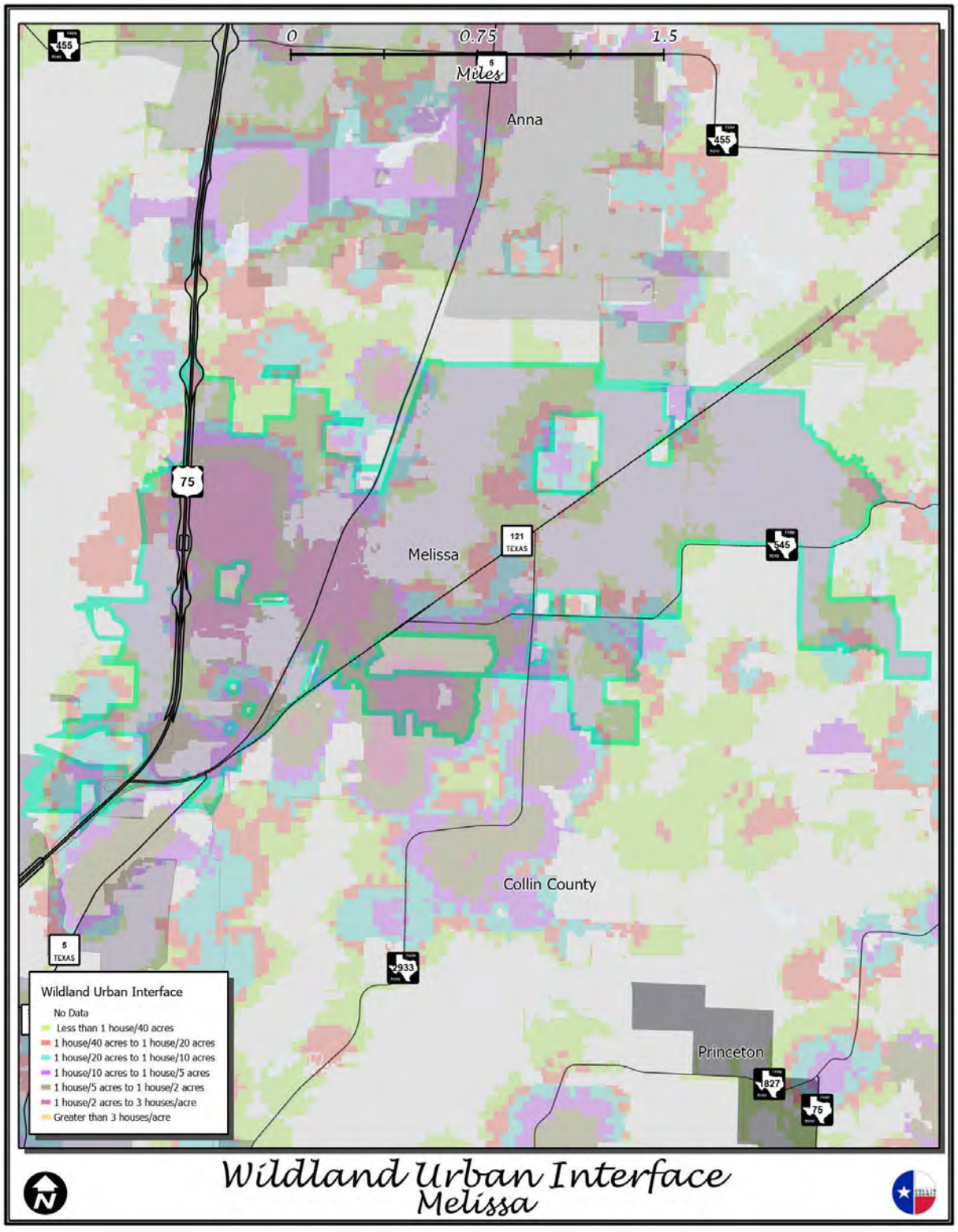

Denton County
380
Prosper
0
1.75
3.5
Miles
Collin County
McKinney
289
TEXAS
Frisco
121
TEXAS
Allen
Plano
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Frisco

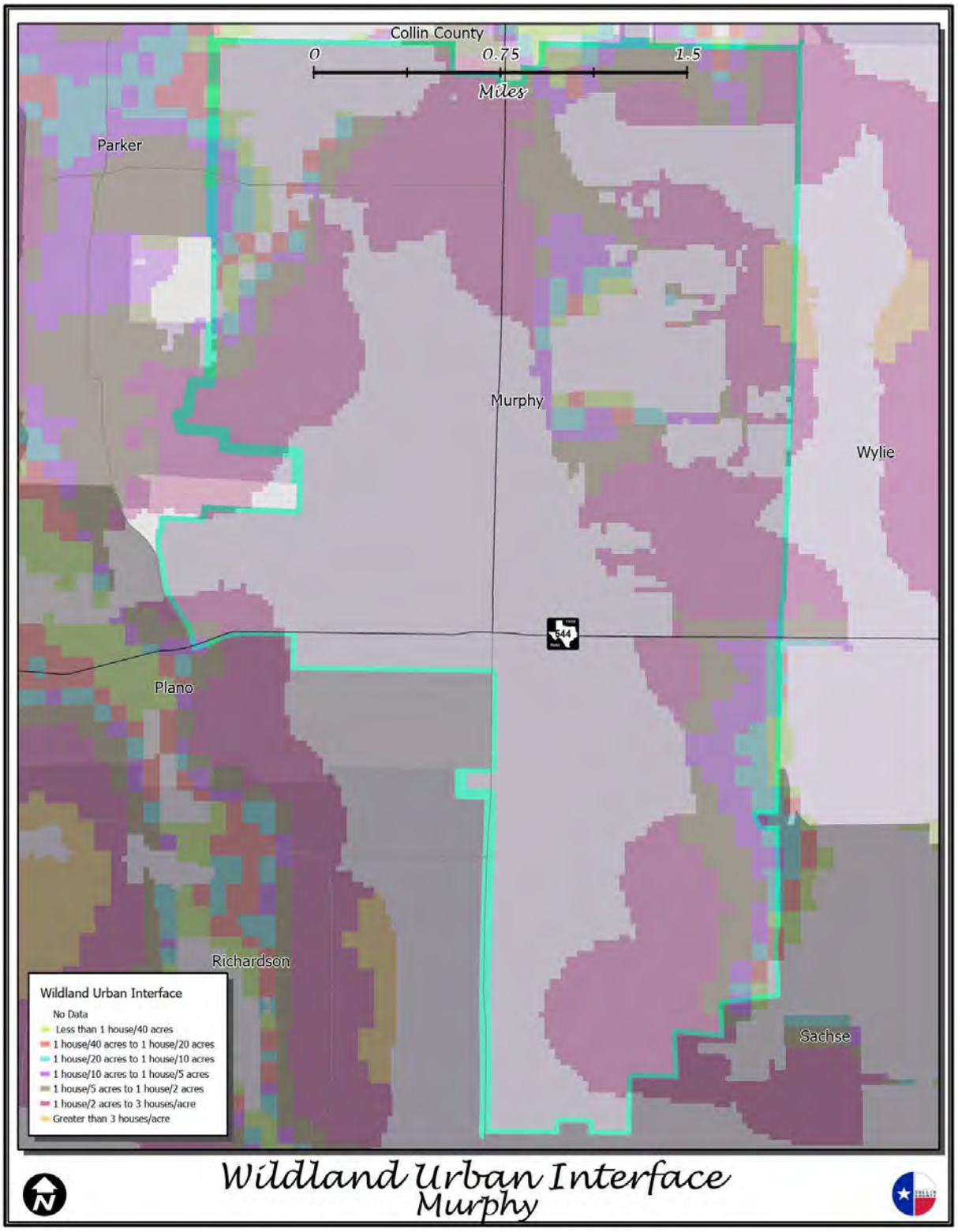

0
0.75
1.5
Miles
Collin County
Josephine
Nevada
Hunt County
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Josephine

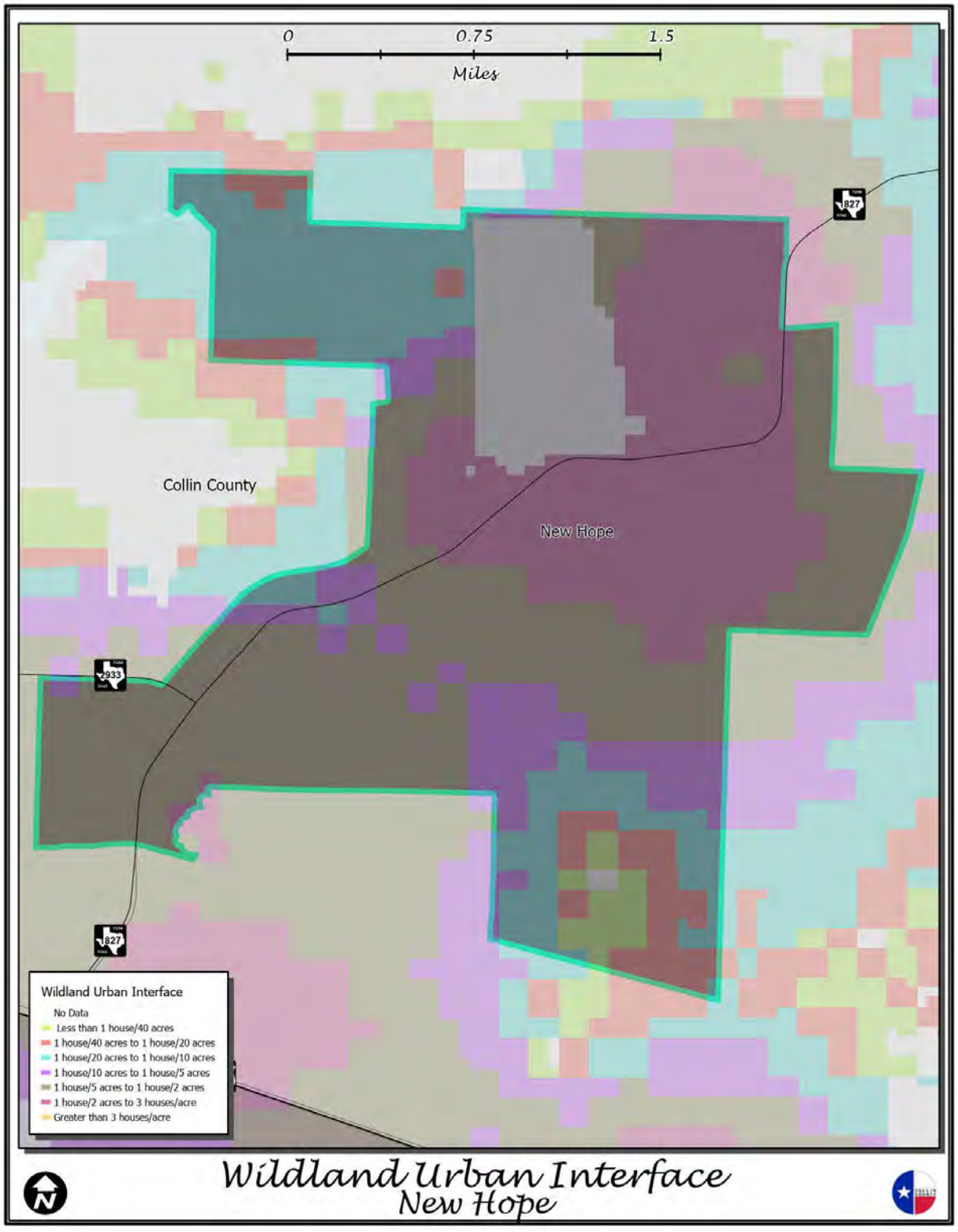

0
0.75
1.5
Miles
Wylie
Nevada
78
TEXAS
Lavon
Collin County
205
TEXAS
6
2755
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Lavon

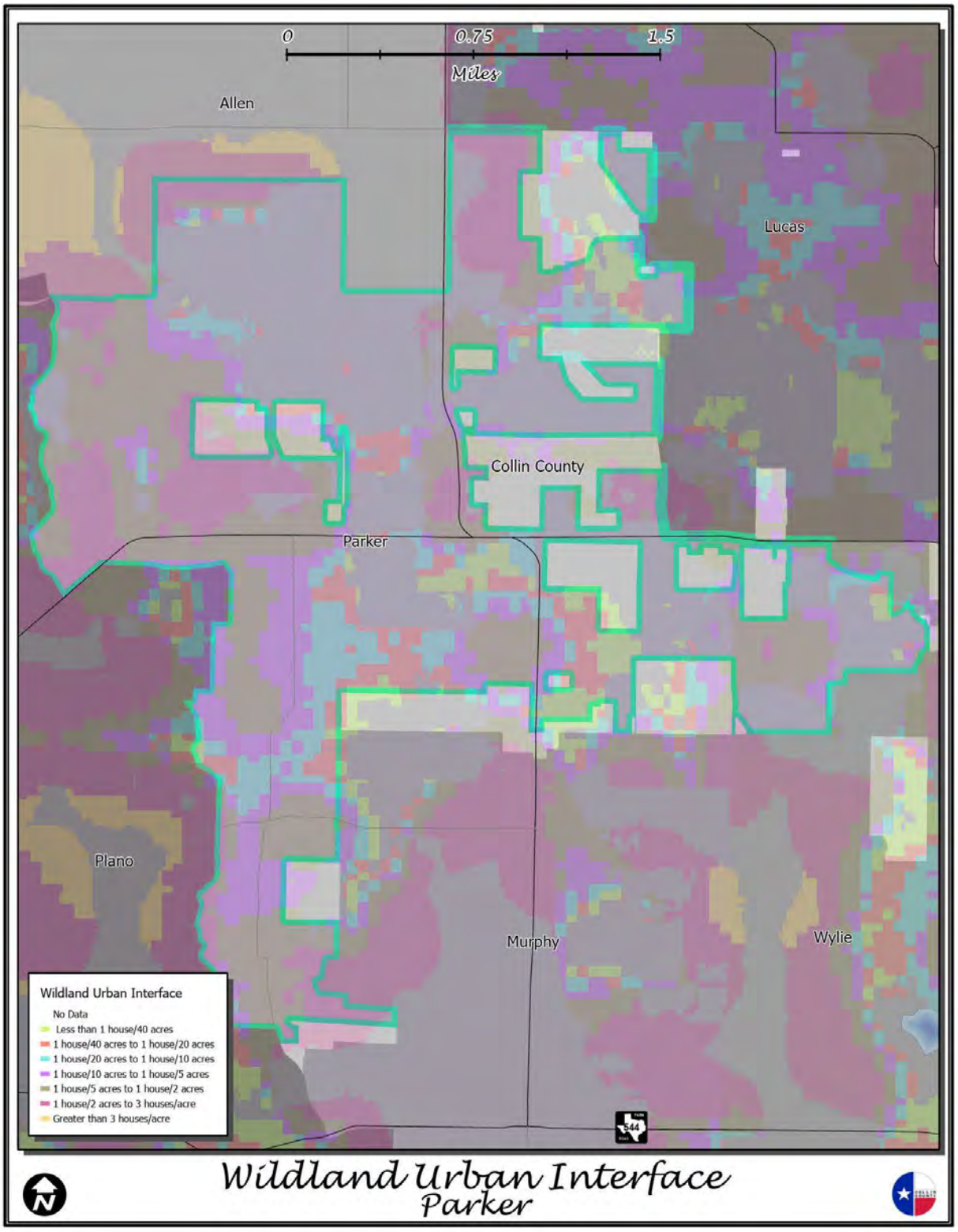

0
0.75
1.5
Miles
McKinney
380
Princeton
Lowry
Crossing
Collin County
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
546
Wildland Urban Interface
Lowry Crossing

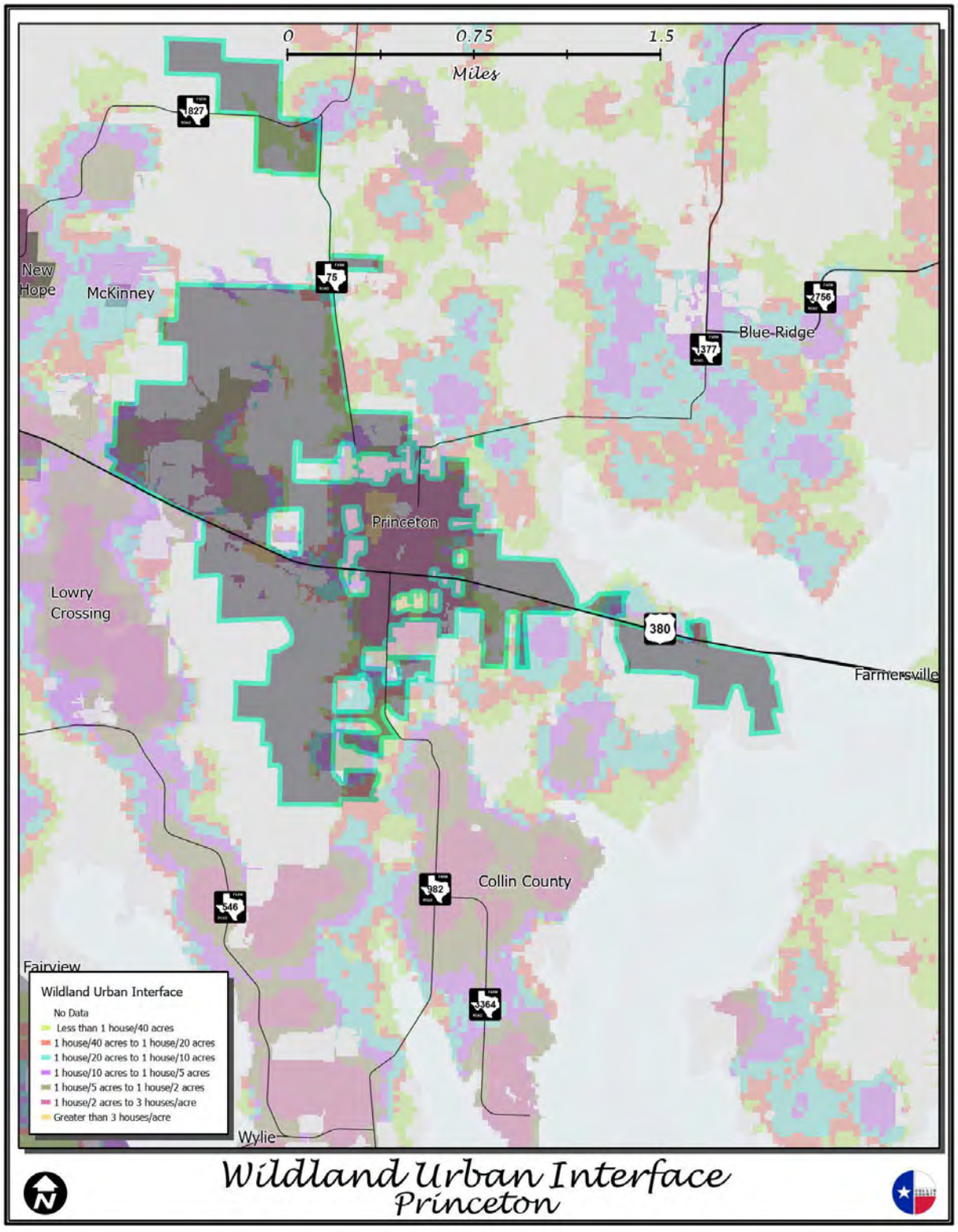

0
0.75
1.5
Miles
Fairview
Allen
Collin County
Lucas
Wylie
Parker
Saint Paul
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Lucas

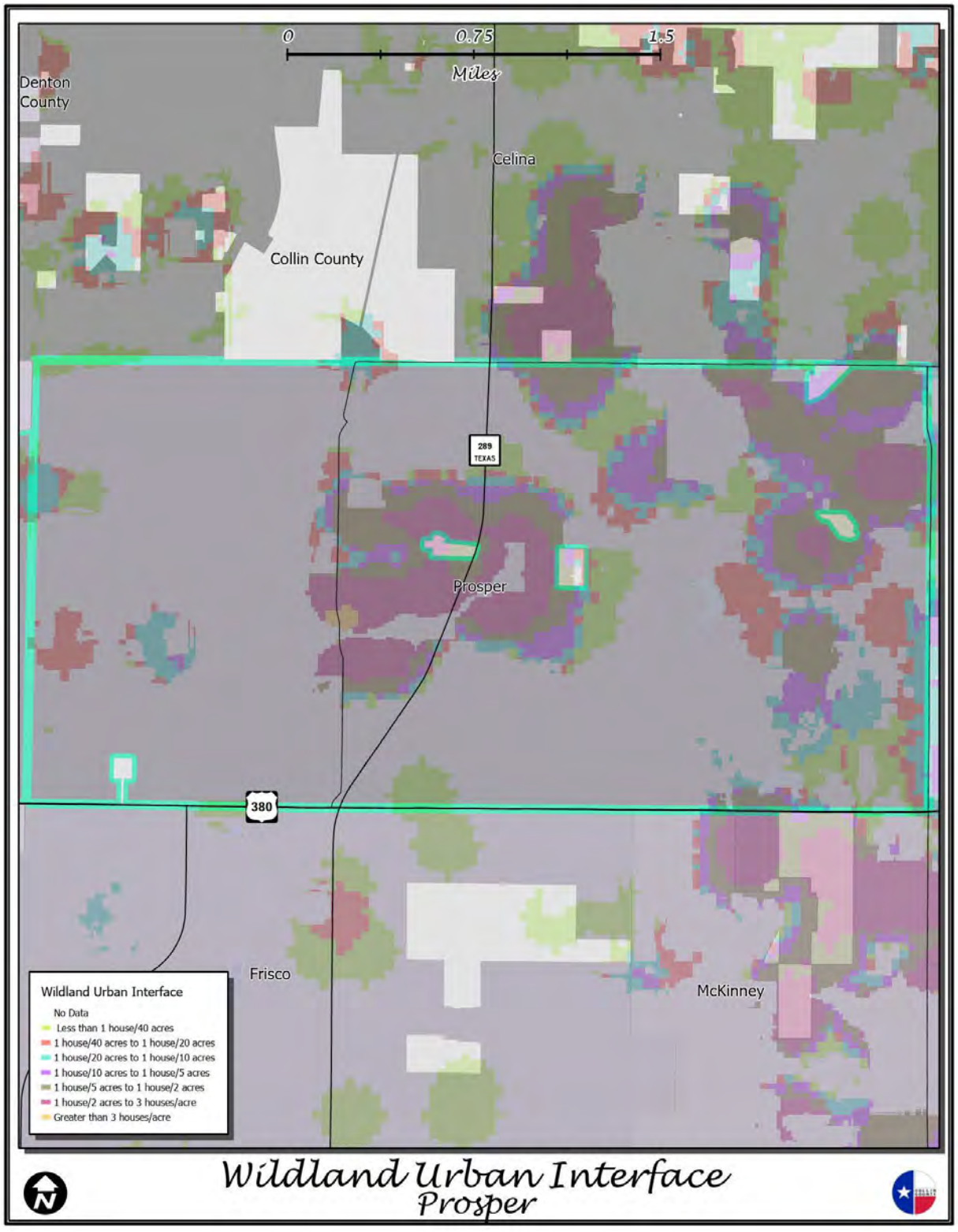

0
0.75
1.5
Miles
Anna
Melissa
Collin County
Princeton
75
121
TEXAS
455
545
5
TEXAS
2933
1827
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Melissa

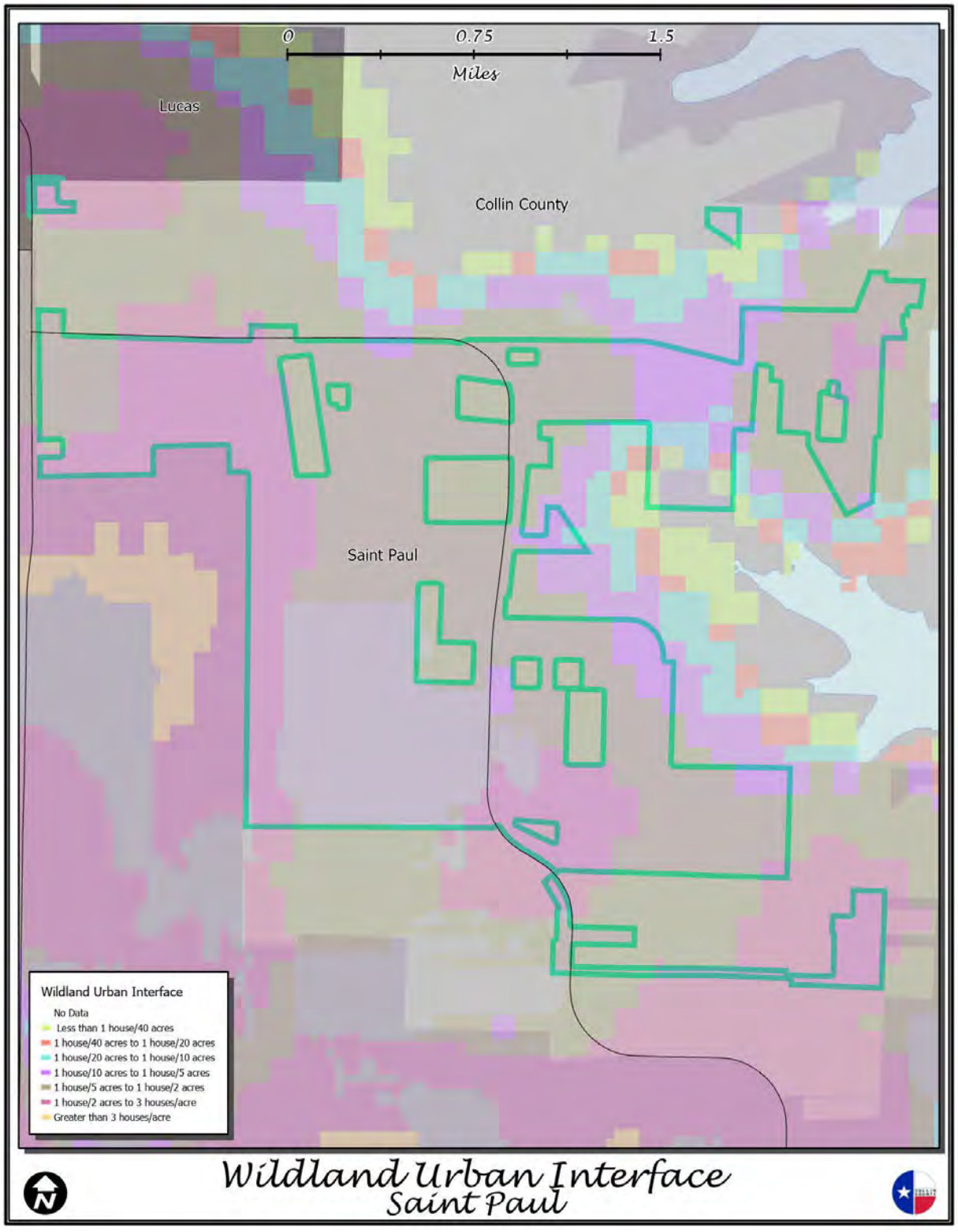

Collin County
0
0.75
1.5
Miles
Parker
Murphy
Wylie
544
Plano
Richardson
Sachse
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Murphy

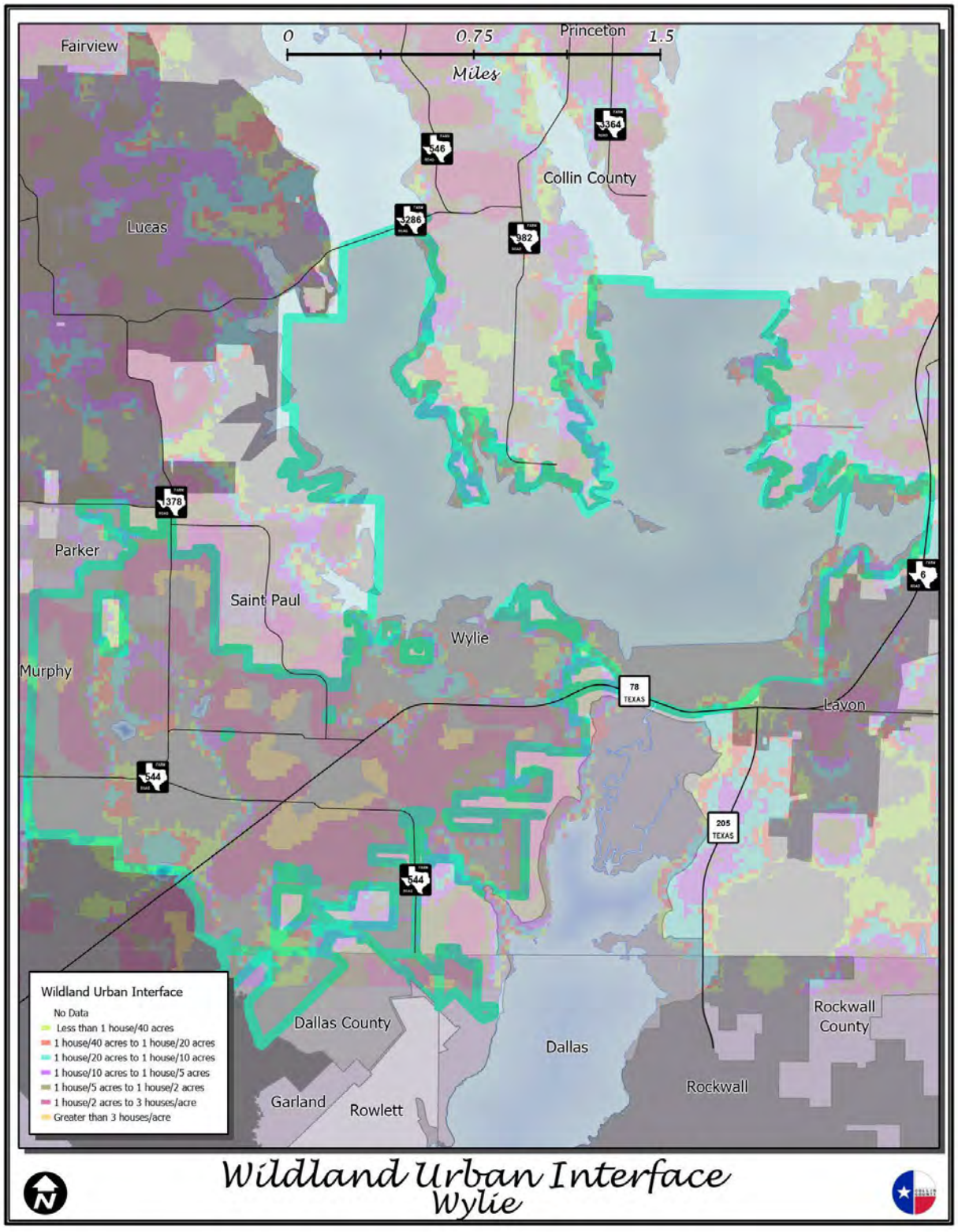

0
0.75
1.5
Miles
Collin County
New Hope
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
New Hope


0
0.75
1.5
Miles
Allen
Lucas
Collin County
Parker
Plano
Murphy
Wylie
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
544
Wildland Urban Interface
Parker


0
0.75
1.5
Miles
827
New Hope
McKinney
75
756
Blue Ridge
877
Princeton
Lowry Crossing
380
Farmersville
Collin County
982
546
Fairview
364
Wylie
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Princeton


0
0.75
1.5
Miles
Denton County
Celina
Collin County
289 TEXAS
Prosper
380
Frisco
McKinney
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Prosper


0
0.75
1.5
Miles
Lucas
Collin County
Saint Paul
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Saint Paul


0
0.75
1.5
Miles
Fairview
Princeton
Collin County
Lucas
Parker
Saint Paul
Wylie
Murphy
Lavon
Dallas County
Dallas
Rockwall County
Rockwall
Garland
Rowlett
546
364
286
982
378
544
544
205
TEXAS
78
TEXAS
6
Wildland Urban Interface
No Data
Less than 1 house/40 acres
1 house/40 acres to 1 house/20 acres
1 house/20 acres to 1 house/10 acres
1 house/10 acres to 1 house/5 acres
1 house/5 acres to 1 house/2 acres
1 house/2 acres to 3 houses/acre
Greater than 3 houses/acre
Wildland Urban Interface
Wylie

3.3 Extent

Natural Hazards are judged on specific extent scales. The following are the known extent scales for the natural hazards as addressed in the Collin County Hazard Mitigation Action Plan.

Drought

Drought Severity Classification

		Ranges					
Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Short and Long-term Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	-1.3 to -1.5	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	-1.6 to -1.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2	0-2	-2.0 or less	0-2

Short-term drought indicator blends focus on 1-3 month precipitation. Long-term blends focus on 6-60 months. Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Keetch-Byram Drought Index (KBDI), and NOAA/NESDIS satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index (SWSI). Other indicators include groundwater levels, reservoir storage, and pasture/range conditions.

PDSI Classifications for Dry and Wet Periods	
4.00 or more	Extremely wet
3.00 to 3.99	Very wet
2.00 to 2.99	Moderately wet
1.00 to 1.99	Slightly wet
0.50 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.50 to -0.99	Incipient dry spell
-1.00 to -1.99	Mild drought
-2.00 to -2.99	Moderate drought
-3.00 to -3.99	Severe drought
-4.00 or less	Extreme drought

Source: http://drought.unl.edu/whatis/indices.htm

Drought conditions do occur in this community. The PDSI Classification allows community planners to anticipate the effects of drought and plan preparedness and mitigation activities for future events as they will likely occur. The last event of widespread drought in Collin County was in August 2018.

Collin County and participating jurisdictions have experienced 57 drought events, ranging from Abnormally Dry (D0) to Exceptional Drought (D4), during the time period analyzed for this plan (01/01/1996-09/22/2020). It can be expected that future drought events will be of similar magnitude.

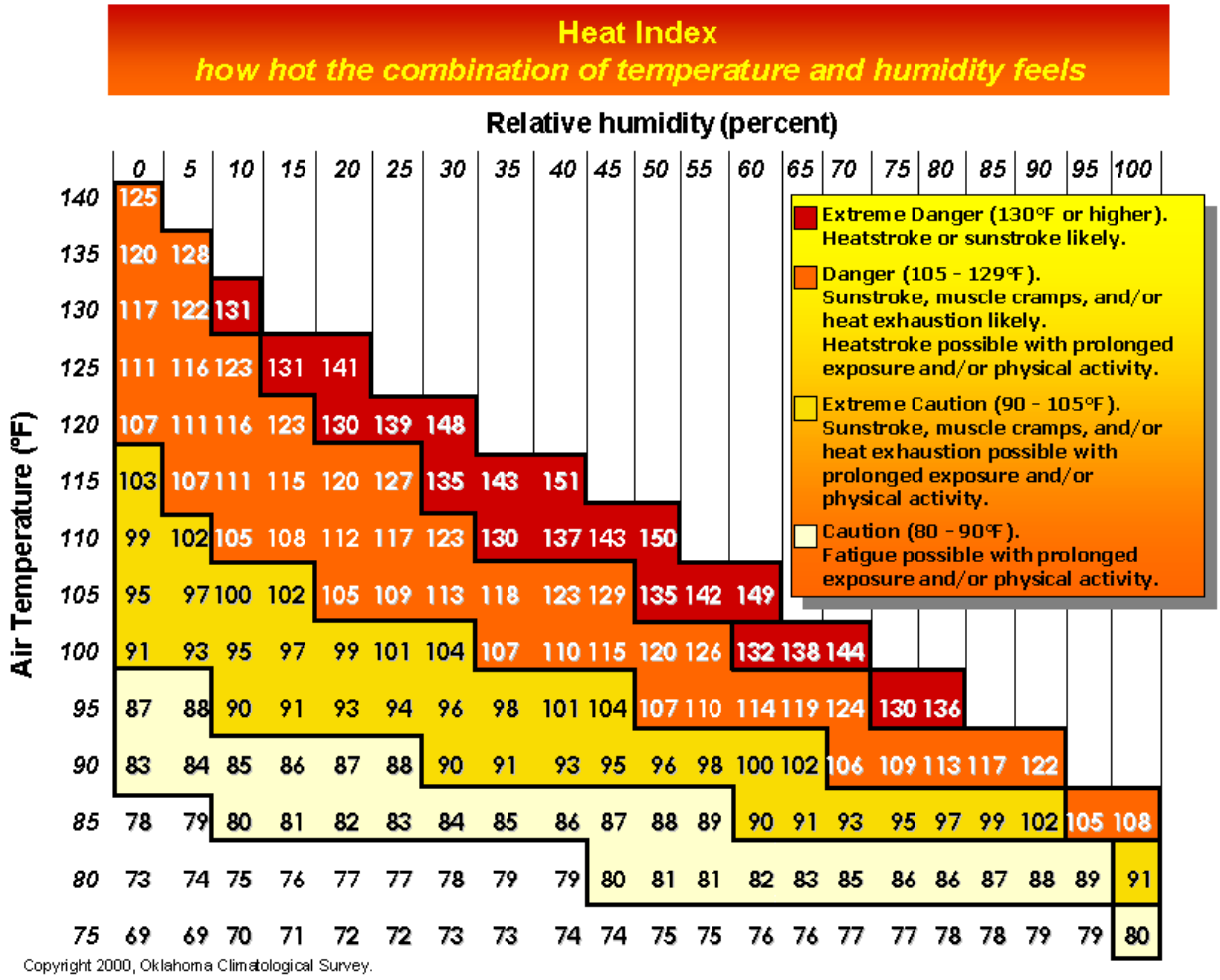
Earthquake: Mercalli & Richter Scales Comparison

Mercalli Scale	Richter Scale	
I.	0 – 1.9	Not felt. Marginal and long period effects of large earthquakes.
II.	2.0 -2.9	Felt by persons at rest, on upper floors, or favorably placed.
III.	3.0 – 3.9	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV.	4.0 - 4.3	Hanging objects swing. Vibration like passing of heavy trucks. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink the upper range of IV, wooden walls and frame creak.
V.	4.4 - 4.8	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Pendulum clocks stop, start.
VI.	4.9 - 5.4	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Books, etc., off shelves. Pictures off walls. Furniture moved. Weak plaster and masonry D cracked. Small bells ring. Trees, bushes shaken.
VII.	5.5 - 6.1	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Waves on ponds. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII.	6.2 - 6.5	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX.	6.6 - 6.9	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X.	7.0 - 7.3	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI.	7.4 - 8.1	Rails bent greatly. Underground pipelines completely out of service.
XII.	> 8.1	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.
Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.
Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.
Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.
Source: http://www.abag.ca.gov/bayarea/eqmaps/doc/mmigif/m10.html

The Mercalli and Richter Scales allow planners to assess the impact earthquakes have. There have been no recorded earthquakes in Collin County. Collin County and participating jurisdictions did not experience any earthquakes during the time period analyzed for this plan (01/01/1996 – 09/22/2020). There is the potential for future earthquake events. At this time, due to Collin County not experiencing any earthquakes in recent history, there is no way to quantify the impacts on Collin County.

Extreme Heat / Heat Index



Source: http://www.ima.army.mil/southwest/sites/divisions/Safety/Heat%20Index.gif

The Heat Index chart displays the relative danger in regards to air temperature and relative humidity. Extreme heat is a hazard this community faces on an annual basis during the summer season. A combination of high temperatures and high humidity prompt heat advisories. This chart allows communities to assess the citizen's danger in regards to heat index. According to the National Centers for Environmental Information, there have been 8 extreme heat events recorded in Collin County since 1/1/1996.

Collin County and participating jurisdictions experienced 19 excessive heat events during the time period analyzed for this plan (01/01/1996 – 09/22/2020). The whole North Texas region experienced over a month of 100-degree plus temperatures during this time. It can be expected that any future heat or excessive heat incidents will be similar in magnitude.

Expansive Soils



Map Legend	
	Unit contains abundant clay having high swelling potential
	Part of unit (generally less than 50%) consists of clay having high swelling potential
	Unit contains abundant clay having slight to moderate swelling potential
	Part of unit (generally less than 50%) consists of clay having slight to moderate swelling potential
	Unit contains little or no swelling clay
	Data insufficient to indicate clay content of unit and/or swelling potential of clay (Shown in western most states only)

Swelling Clays Map

Source: U.S. Geological Survey; Swelling Clays Map of the Conterminous U.S.

The U.S. Geological Survey map above shows the varying types of expansive soils found in Texas. The type of soil predominate in Collin County is generally comprised of less than 50% of clay that has a high swelling potential.

Flooding

Flood Zones		
Zone A	The 100-year or Base Floodplain. There are six types of A zones:	
	A	The base floodplains mapped by approximate methods, i.e., BFEs are not determined. This is often called an unnumbered A zone or an approximate A zone.
	A1-30	These are known as numbered A zones (e.g., A7 or A14). This is the base floodplain where the firm shows a BFE (old format).
	AE	The base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.
	AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
	AH	Shallow flooding base floodplain. BFE's are provided.
	A99	Area to be protected from base flood by levees or Federal flood protection systems under construction. BFEs are not determined.
	AR	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection
Zone V and VE	V	The coastal area subject to velocity hazard (wave action) where BFEs are not determined on the FIRM.
	VE	The coastal area subject to velocity hazard (wave action) where BFEs are provided on the FIRM.
Zone B and Zone X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and the 500-year floods. B zones are also used to designate base floodplains or lesser hazards, such as areas protected by levees from the 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.	
Zone C and Zone X (unshaded)	Area of minimal flood hazard, usually depiction FIRMs as exceeding the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood.	
Zone D	Area of undetermined but possible flood hazards.	

Source: http://www.fema.gov/floodplain-management/flood-zones

Flood hazard areas are identified as a Special Flood Hazard Area (SFHA). SFHAs are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone V, and Zone VE. Moderate flood hazard areas, labeled Zone B or Zone X, are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are defined as Zone C or Zone X. These flood zone identifications allow planners to determine appropriate land use in designated zones.

The planning communities are participants in the National Flood Insurance Program and actively take measures to plan land use. The communities are subject to flash flooding hazards such as the event in 6/26/2007 that occurred in the City of Celina. According to the National Centers for Environmental Information, the flash flood event resulted in $20,000 worth of property damage.

Collin County and participating jurisdictions experienced 86 flood and flash flood events during the time period analyzed for this plan (01/01/1996 - 09/22/2020). Most of the flood and flash flood events were a result of excessive rainfall over a short amount of time. These events resulted mainly in over-the-road

flooding and minor to moderate property damage. Floodwaters during these events ranged from 2-5 inches to feet. It can be expected that any future flood or flash flood events will be similar in magnitude.

Due to many variables, the full extent and impacts of flooding is not fully known at this time. Collin County typically sees more nuisance flooding and flash flooding. Some of this is temporary in nature to construction and can be difficult to know the impacts until an event occurs. An example of this, was in September of 2018. Highway 75 was under construction in Plano and the area received over 5 inches of rain. Typically the roadway does not flood, but due to temporary barriers installed, this area became a river. Once the construction was completed, and the barriers removed, the same area no longer floods. As stated previously, determine the exact impacts from flooding could use more data to help predict where flooding is more likely to occur, even out of flood zones, and then assist in the development of potential action items to mitigate those impacts.

Hail

Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

The Hailstorm Intensity Scale is representative of the damage from hailstorms this community has experienced in the past and will likely experience in the future. The Hailstorm Intensity Scale allows planners to gauge past damage and mitigate for future expected damage. For example, according to the National Centers for Environmental Information, on 5/21/2011, 2.00in (H6/egg size) hail caused $25,000 of property damage in the City of Celina.

Collin County and participating jurisdictions experienced 459 hail events ranging from magnitude H2 (.75 inch diameters) to magnitude H10 (4+ inch diameters), during the time period analyzed for this plan (01/01/1985—09/22/2020). It can be expected that any future hail events will be similar in magnitude.

High Winds

Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Source: http://www.spc.noaa.gov/faq/tornado/beaufort.html

The Beaufort Wind Scale is representative of the damage from high winds this community may endure. The Beaufort Wind Scale allows planners in the community to assess historical data and mitigate for future high windstorms. For example, according to the National Centers for Environmental Information , in 2010 the City of Wylie experienced Force 12 (64+ knots) winds that blew down trees and fences, which caused $50,000 worth of damage.

Collin County and participating jurisdictions experienced 369 high wind events ranging from Force 0 to Force 12 (0 knots to 64+ knots), during the time period analyzed for this plan (01/01/1950—09/22/2020). It can be expected that any future high wind events will be similar in magnitude.

Lightning Activity Level Grid

Lightning Activity Level (LAL) A scale which describes lightning activity. Values are labeled 1-6:	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

Source: http://www.nws.noaa.gov/forecasts/wfo/definitions/defineLAL.html

The Lightning Activity Level grid provides a way to gauge the average number of strikes that may accompany a given type of storm. The average number of strikes is given since the density of lightning strikes varies from storm to storm.

Typically Collin County would see LAL 5 and lower. Dry lightning is not typically found in our area as we receive moisture from the Gulf of Mexico.

Collin County and participating jurisdictions experienced 56 lightning events during the time period analyzed for this plan (01/01/1996—09/22/2020). It can be expected that any future lightning events will be similar in magnitude.

Tornado

Fujita Scale

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; manufactured homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; manufactured homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

Source: http://tornadoproject.com/fscale/fscale.htm

On February 1, 2007, the Fujita scale was decommissioned in favor of the more accurate Enhanced Fujita Scale, which replaced it. None of the tornados recorded on or before January 31, 2007 will be re-categorized. Therefore maintaining the Fujita scale will be necessary when referring to previous events.

Enhanced Fujita Scale

Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; manufactured homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; manufactured homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation;

Source: http://www.spc.noaa.gov/efscale/

The Enhanced Fujita Scale is representative of the damage from tornados this community has faced in the past and will no doubt face in the future. The Enhanced Fujita Scale allows planners to prepare and mitigate future potential damage by assessing the historical nature of tornados in the planning community. For example, according to the National Centers for Environmental Information in 2007, an F0 tornado occurred in the City of Wylie. The tornado caused $500,000 worth of property damage.

Collin County and participating jurisdictions experienced 48 tornado events ranging from EF0 to F3 (65mph to 206mph), during the time period analyzed for this plan (01/01/1950 — 09/22/2020). It can be expected that any future tornado events will be similar in magnitude.

Wildfire

Keetch-Byram Drought Index

KBDI	Fire Potential
0-200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200-400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400-600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600-800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Source: http://www.tamu.edu/ticc/KBDI%20Fact%20Sheet.pdf

The index scale ranges from 0 to 800 and represents moisture deficiency in hundredths of an inch. By looking at indicators of moisture deficiency in the soil in this chart, communities are able to assess when they are at a heightened danger for a wildfire. According to the National Centers for Environmental Information, there have been four wildfire events in Collin County since 1/1/1996. In 9/5/2011, a wildfire caused $50,000 in property damage.

Collin County and participating jurisdictions experienced four wildfire events during the time period analyzed for this plan (01/01/1996 — 9/22/2020). These fires ranged from grassfires that destroyed 12 bales of hay, five homes, and caused one death, to a wildfire that burned 100 acres. It can be expected that any future wildland fire events will be similar in magnitude.

Fire Danger

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) COLOR CODE: Green	fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) COLOR CODE: Blue	fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
CLASS 3: High Danger (H) COLOR CODE: Yellow	fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) COLOR CODE: Orange	fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) COLOR CODE: Red	fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

Source: http://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32/class-rating-fire-potential-danger-51?task=view

Wind Chill

Wind Chill is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. The index was created in 1870, and on November 1, 2001, the National Weather Service released a more scientifically accurate equation, which we use today. Here is a chart for calculating wind chill. (Please note that it is not applicable in calm winds or when the temperature is over 50°.)

Wind Chill Chart

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

Source: National Weather Service and NOAA

The Wind Chill Chart displays the frostbite times in regard to temperature and wind. This chart allows the communities to prepare for severe winter storm or an ice event. These events are infrequent but can cause damage. The primary areas of concern are on bridges and roadways. For example, according to the National Centers for Environmental Information , on 2/11/2010, a heavy snowstorm caused $1,000,000 in property damage across Collin County.

Collin County and participating jurisdictions experienced 56 winter storm events ranging from heavy snow to ice, during the time period analyzed for this plan (01/01/1996—09/22/2020). Accumulations during these events ranged from 1-3 inches of sleet, .25-1.5 inches of ice, and .5 to 12 inches of snow. It can be expected that any future events will be similar in magnitude.

Local Extent Having identified the extent scales by which hazards are ranked, the participating jurisdictions have utilized the following definitions to determine the expected extent/severity for their planning area.

	High	Medium	Low
Dam Failure	• Greater than 50% of city structures are in the inundation zone. Greater than 50% of the city's critical infrastructure in the identified inundation zone	• 20%-50% of city structures are in the inundation zone. • 20%-50% of the city's critical infrastructure in the inundation zone	• Less than 20% of city structures are in the inundation zone. • Less than 20% of the city's critical infrastructure in the inundation zone
Drought	• PDSI -3.00- -4.00 or less • Severe to extreme drought conditions	• PDSI -1.00- -2.99 • Mild to moderate drought conditions	• PDSI -4.00 or more - -0.99 • Extremely wet to incipient dry spells
Earthquake	• Mercalli Scale: VIII-XII • Richter Scale: 6.2->8.1 • Driving will be difficult, increase in damage to infrastructures and objects can be thrown	• Mercalli Scale: VI-VII • Richter Scale: 4.9-6.1 • All will feel the event, walking will be difficult, glassware will break, irrigation ditches damaged	• Mercalli Scale: I-V • Richter Scale: 0-4.8 • Range of feeling the event is cannot be felt to being felt outdoors. Doors may swing close and liquids may be disturbed.
Expansive Soils	• EI Expansion Potential: 91-130 (High) • EI Expansion Potential: >130 (Very High)	• EI Expansion Potential: 51-90 (Medium)	• EI Expansion Potential: 21-50 (Low) • EI Expansion Potential: 0-21 (Very Low)
Extreme Heat	• Heat Index >130F • Heatstroke or sunstroke likely	• Heat Index 105F-129F • Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.	• Heat Index 80F-105F • Fatigue possible with prolonged exposure and/or physical activity, Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Flooding	• 100yr Flood Zone, Zone A • The extent of severity in the 100yr Flood Zone will be dependent on the structures and livestock located in the identified area.	• 500yr Flood Zone, Zone B • The extent of severity in the 500yr Flood Zone will be dependent on the structures and livestock located in the identified area.	• Outside of 100yr and 500yr Flood Zones, Zone C, F, X • Potential for flooding due to local drainage problem
Hail	• H7-H10, 2.4"->4" • There will be severe damage. Including roof and structural damage and risk of serious injuries to fatalities.	• H5-H6, 1.6"-2.4" • There will be a range of severe damage from well-constructed houses being destroyed to houses being swept away.	• H0-H4, 0"-1.6" • There will be a variance of destruction to vegetation and slight damage to glass.
High Winds	• Force: 8-12 • Knots: 28-64+ • Whole trees moving to considerable structure damage	• Force: 4-6 • Knots: 11-27 • Dust, leaves, and loose paper lifted. Small to Large branches moving.	• Force: 0-3 • Knots: <1-10 • Calm, leaves rustle, light flags extended

	High	Medium	Low
Tornado	• EF3-EF5 • There will be a range of severe damage from well-constructed houses being destroyed to houses being swept away	• EF1-EF2 • There will be a range of moderate to considerate damage. Roofs will be severely stripped, manufactured homes overturned, and cars lifted off of the ground	• EF0 • There will be light damage. Roofs will be peeled off, gutters damaged, and branches broken
Wildland Fire	• KBDI 600-800 • Associated with severe drought. Intense, deep-burning fires with significant downwind spotting.	• KBDI 200-400 • Ranges from lower litter and duff layers are drying and beginning to contribute to fire intensity to them causing the fire to burn actively.	• KBDI 0-200 • Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity.
Winter Storms	• Temperatures 15F- -45F • Wind Chill 7F- -98F • At wind chill of -19 frostbite will occur in 30 minutes increasing in severity to occurrence in 5 minutes.	• Temperatures 30F- 20F • Wind Chill 25F- -4F • Bridges and roadways are at risk to ice	• Temperatures 40F- 35F • Wind Chill 36F-17F • Vulnerable populations and agriculture at risk to lower temperatures and wind chill.
Lightning	• Lightning is ranked based on LAL, see page 91. It is not typically ranked based on severity, but based on frequency; however, even one lightning strike can have the same, if not more, impacts than many lightning strikes depending on what it impacts/strikes. Unlike other hazards that are typically ranked/rated on severity. See Page 91 for LAL scale and information.		

The charts below depict the estimated average of extent as ranked by the jurisdictions.

	Collin County	Allen	Anna	Blue Ridge	Celina
Dam Failure	Low	None	Medium	None	Low
Drought	Medium	Low	Medium	Medium	Medium
Earthquake	Medium	None	None	Low	None
Expansive Soils	Medium	None	Low	Low	Low
Extreme Heat	Medium	Medium	Low	Medium	Medium
Flooding	Low	Low	Low	Medium	High
Hail	High	Medium	Low	Low	Low
High Winds	Medium	Medium	Medium	Medium	Low
Lightning	Low	Low	Low	Low	Medium
Tornado	Medium	Medium	Medium	High	High
Wildland Fire	Medium	No	Low	Medium	Medium
Winter Storms	Low	Medium	Medium	Medium	Medium

	Fairview	Farmersville	Frisco	Josephine	Lavon
Dam Failure	None	Medium	Low	None	Low
Drought	Medium	Medium	Low	Medium	Low
Earthquake	Low	Low	Medium	Low	Low
Expansive Soils	Low	Low	Medium	Low	Low
Extreme Heat	Low	Low	Low	Low	Medium
Flooding	Low	Low	Low	Low	Low
Hail	Low	Low	Medium	Low	Low
High Winds	Low	Medium	Medium	Low	Low
Lightning	Low	Low	Medium	Low	Low
Tornado	Medium	Medium	Medium	Medium	High
Wildland Fire	Low	Medium	Low	Medium	Medium
Winter Storms	Low	Medium	High	Medium	Medium

	Lowry Crossing	Lucas	Melissa	Murphy	New Hope
Dam Failure	None	None	Low	None	Low
Drought	Medium	Medium	Medium	Medium	Low
Earthquake	Low	Low	Low	Low	Low
Expansive Soils	Low	Low	Low	Low	Low
Extreme Heat	Low	Medium	Low	Medium	Medium
Flooding	Low	Medium	Low	Low	Low
Hail	Low	Low	Low	Low	Medium
High Winds	Low	Low	Low	Low	Low
Lightning	Low	Medium	Low	Medium	Low
Tornado	Medium	Medium	Medium	Low	Medium
Wildland Fire	Low	Medium	Medium	Low	Low
Winter Storms	Medium	Medium	Medium	Medium	Medium

	Parker	Princeton	Prosper	St. Paul	Wylie
Dam Failure	None	None	Low	None	Low
Drought	Medium	Medium	Medium	Medium	Low
Earthquake	None	Low	Low	Low	Low
Expansive Soils	Low	Low	Low	Low	Low
Extreme Heat	Low	Medium	Medium	Low	Low
Flooding	Low	Medium	Medium	Low	Low
Hail	Low	Low	Medium	Low	Medium
High Winds	Low	Medium	Medium	Low	Low
Lightning	Low	Low	High	Low	Low
Tornado	Low	Medium	High	Medium	High
Wildland Fire	Low	Low	Medium	Medium	Low
Winter Storms	Low	Medium	Medium	Medium	Medium

3.4 Geographic Information System Based Analysis

For the Geographic Information System-based assessment, digital data was collected from local, state, and national sources. ESRI® ArcMap™ 10.2 was used to assess risk utilizing digital data, which included local tax records for individual parcels and geo-referenced point locations for buildings and critical facilities.

The objective of the Geographic Information System-based analysis was to determine the estimated vulnerability of the five categories of assets to the identified hazards for Collin County using best available geospatial data. Local databases made available through Collin County, such as local tax assessor records, parcel boundaries, building footprints and critical and emergency facilities data, were used in combination with digital hazard data obtained from the National Centers for Environmental Information and the FEMA Resilience and Planning Tool. The results of the analysis provided an estimated number of people, as well as the numbers and values of buildings and critical facilities determined to be potentially at risk to hazards with delineable geographic hazard boundaries.

For some of the hazards, the Geographic Information System analysis was supplemented with a statistical analysis conducted on the historical data obtained from National Centers for Environmental Information and the Texas Forest Service for wildfires. The data included both casualty and property losses from hazard events that occurred in Collin County from 1/1/1950 or 1/1/1985 or 1/1/1996 to 9/22/2020. Annualized personal and property losses were calculated by dividing the total losses by the number of years for which data was available (i.e. 24 or 35 or 70 years).

Drought

Because drought impacts large areas that cross jurisdictional boundaries, all of the improved property and population in Collin County are considered to be exposed to this hazard. However, drought impacts are mostly experienced in water shortages and crop losses on agricultural lands, with little to no impact on buildings.

Since crop losses are expected to be the most vulnerable assets for this hazard, agricultural land acreage was acquired from the USGS land cover classification data to estimate the relative area of Collin County that would be affected by this event. *Table 3.1* below provides the distribution of agricultural land for each jurisdiction in Collin County. Collin County as a whole has a total of 263,746.98 acres of agricultural lands, which represents approximately 58.65% of Collin County territory, with the vast majority located in the unincorporated areas.

Table 3.1 Agricultural Land in Collin County

Jurisdiction	Total Acres	Agricultural Land Acres	Percentage (%) of Total Acres
Unincorporated County	288,727	215,882	74.77%
Allen	16,899.45	1,228.98	7.27%
Anna	10,273.53	7,240	70.47%
Blue Ridge	1,066.43	427.11	40.05%
Celina	21,575.35	14,727.29	68.26%
Fairview	5,672.38	1,036.25	18.27%
Farmersville	2,2724.78	635.73	23.33%
Frisco	27,747.7	6,425.11	23.16%
Josephine	1,132.93	643.3	56.77%
Lavon	2112	621.79	29.44%
Lowry Crossing	1,644.51	685.42	41.68%
Lucas	10,196.92	2530.5	24.82%
Melissa	7,583.93	1,785.22	23.54%
Murphy	3632.7	70.93	2.00%
New Hope	896.65	717.95	80.10%
Parker	5,431.27	1,900.84	35.00%
Princeton	6,792.03	2,005.08	29.52%
Prosper	11,677.37	4,103.97	35.14%
St. Paul	894.62	199.11	22.26%

Jurisdiction	Total Acres	Agricultural Land Acres	Percentage (%) of Total Acres
Wylie	23,170.14	880.4	3.80%
Total	449,690.42	263,746.98	58.65%

Sources: Texas Forest Service, U.S. Geological Survey, and local jurisdictions

Based on the available information, vulnerability to drought was assessed using two techniques: (1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the Texas Hazard Mitigation Package was used to predict expected monetary and human losses from the event; (2) in fulfillment of Element A of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for drought and the nature of the impacts expected from drought events were used to identify the assets, including existing structures, vulnerable to this hazard. The vulnerability to future structures was not conducted at this time due to unattainable data. Therefore, compliance with Element B of *Requirement 201.6(c)(2)(ii)(A),* describing vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities will be an objective in the five-year planning cycle.

Table 3.2 presents Collin County's recorded historical losses due to drought events as provided in the hazard events database obtained from the National Centers for Environmental Information . Property and personal losses in each expected in each jurisdiction are presented in *Table 3.2*.

Table 3.2 Historical Losses Due to Drought (1/1/1996-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	8/1/1996	0:00	Drought		0	0	$0	$0
Collin (Zone)	7/1/1998	0:00	Drought		0	0	$0	$0
Collin (Zone)	8/1/2000	0:00	Drought		0	0	$0	$0
Collin (Zone)	9/1/2000	0:00	Drought		0	0	$0	$0
Collin (Zone)	5/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	6/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	7/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	8/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	9/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	10/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	11/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	12/1/2005	0:00	Drought		0	0	$0	$0
Collin (Zone)	1/1/2006	0:00	Drought		0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	2/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	3/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	4/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	5/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	6/6/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	7/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	8/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	9/1/2006	0:00	Drought		0	0	$0	$0
Collin (Zone)	10/1/2006	0:00	Drought		0	0	$500,000	$500,000
Collin (Zone)	11/1/2006	0:00	Drought		0	0	$0	$800,000
Collin (Zone)	3/21/2011	0:00	Drought		0	0	$0	$8,000
Collin (Zone)	4/1/2011	0:00	Drought		0	0	$0	$10,000
Collin (Zone)	8/1/2011	0:00	Drought		0	0	$0	$10,000
Collin (Zone)	9/1/2011	0:00	Drought		0	0	$0	$25,000
Collin (Zone)	10/1/2011	0:00	Drought		0	0	$0	$5,000
Collin (Zone)	8/7/2012	0:00	Drought		0	0	$0	$0
Collin (Zone)	9/25/2012	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	11/1/2012	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	12/1/2012	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	1/1/2013	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	2/1/2013	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	3/1/2013	0:00	Drought		0	0	$2,000	$0
Collin (Zone)	7/9/2013	0:00	Drought		0	0	$0	$1,000
Collin (Zone)	8/1/2013	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	9/1/2013	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	3/1/2014	0:00	Drought		0	0	$0	$4,000

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	4/1/2014	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	5/1/2014	0:00	Drought		0	0	$	$3,000
Collin (Zone)	6/1/2014	0:00	Drought		0	0	$	$3,000
Collin (Zone)	7/1/2014	0:00	Drought		0	0	$	$3,000
Collin (Zone)	8/1/2014	0:00	Drought		0	0	$	$2,000
Collin (Zone)	9/1/2014	0:00	Drought		0	0	$5,000	$0
Collin (Zone)	10/1/2014	0:00	Drought		0	0	$0	$3,000
Collin (Zone)	11/1/2014	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	12/1/2014	0:00	Drought		0	0	$0	$5,000
Collin (Zone)	1/1/2015	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	2/1/2015	0:00	Drought		0	0	$0	$2,000
Collin (Zone)	3/1/2015	0:00	Drought		0	0	$0	$1,000
Collin (Zone)	4/1/2015	0:00	Drought		0	0	$0	$1,000
Collin (Zone)	9/1/2015	0:00	Drought		0	0	$0	$1,000
Collin (Zone)	10/1/2015	0:00	Drought		0	0	$2,000	$0
Collin (Zone)	11/21/2017	0:00	Drought		0	0	$0	$0
Collin (Zone)	12/1/2017	0:00	Drought		0	0	$0	$1,000
Collin (Zone)	8/1/2018	0:00	Drought		0	0	$0	$1,000
Totals:					0	0	$509,000	$1,414,000

Source: National Centers for Environmental Information (NCEI)

As observed in Table 3.2 Historical Losses Due to Drought, calculations of annualized losses were conducted using historical data obtained from the National Centers for Environmental Information. The annualized loss value can be interpreted as the impact expected from drought in terms of annualized human losses and human injuries, and annualized property losses. As observed in *table 3.2*, Collin County can expect approximately an annual $21,208.33 in property losses and $58,916.67 of crop losses each year as a result of drought, however values may be underestimated due to lack of accurate reporting. No injuries or deaths are expected from this event.

Since the geographical occurrence of drought is typically regional, the area of potential impacts corresponds to all of Collin County's territory. However, due to the nature of this event, property losses are more likely related to crop damage. Buildings and infrastructure are not expected to be directly impacted by drought events. Therefore, improved property, emergency and critical facilities, and critical structures are not exposed to this hazard.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to drought and impacts to assets expected from drought events can be summarized as follows:

- **Population**: According to National Centers for Environmental Information(NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events. All the population of Collin County is exposed to this hazard.
- **Improved Property**: According to National Centers for Environmental Information(NCEI), a loss of $21,208.33 per year can be expected in property loss due to damage from drought though values are underestimated due to lack of accurate reporting. Available historical data indicates that the expected losses from drought correspond to crop losses in the amount of $58,916.67 per year, mostly experienced in water shortages and crop losses on agricultural lands though values are underestimated due to lack of accurate reporting.
- **Emergency Facilities**: Because of the nature of this hazard, there are no losses or direct impacts expected on emergency facilities due to drought events.
- **Critical Facilities**: Because of the nature of this hazard, there are no losses or direct impacts expected on critical facilities due to drought events.
- **Critical Infrastructure**: Because of the nature of this hazard, there are no losses or direct impacts expected on critical infrastructure due to drought events.

Information needed to fulfill *Requirement 201.6(c)(2)(ii*)(C), which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Flood

Floods impact large areas and cross jurisdictional boundaries. All five categories of assets are considered vulnerable and can be exposed to this hazard. Based on the available information, vulnerability to flooding was assessed using two techniques: (1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from National Centers for Environmental Information was used to predict expected monetary and human losses from the event; (2) in fulfillment of Element A of *Requirement 201.6(c)(2)(ii)(A*), geographical data was used to identify the assets, including existing structures, vulnerable to flooding. The vulnerability to future structures was not assessed at this time due to unattainable data. Therefore, compliance with Element B of *Requirement 201.6(c)(2)(ii)(A),* describing vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities will be an objective in the five-year planning cycle.

Table 3.3 presents Collin County's recorded historical losses due to flooding as provided in the hazard events database obtained by National Centers for Environmental Information (NCEI). Although specific data is provided by jurisdiction, the figures presented may reflect the place where the event was more relevant or where it started. There were no recorded floods or flash flood events for the following jurisdictions: Josephine, Lowry Crossing, Lucas, New Hope, and St. Paul.

Table 3.3 Historical Losses Due to Flood Events (1/1/1996-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Frisco	10/27/1996	21:20	Flash Flood		0	0	$0	$0
Melissa	11/7/1996	0:30	Flash Flood		0	0	$10,000	$0
Plano	2/19/1997	16:30	Flash Flood		0	0	$0	$0
Mc Kinney	2/19/1997	16:51	Flash Flood		0	0	$0	$0
Lolaville	2/19/1997	18:00	Flash Flood		0	0	$0	$0
Farmersville	2/19/1997	18:25	Flash Flood		0	0	$0	$0
Mc Kinney	4/4/1997	22:25	Flash Flood		0	0	$0	$0
Plano	5/19/1997	18:15	Flash Flood		0	0	$0	$0
Plano	5/19/1997	19:02	Flash Flood		0	0	$10,000	$0
Plano	5/19/1997	19:30	Flash Flood		0	0	$0	$0
Plano	6/9/1997	20:48	Flash Flood		0	0	$0	$0
Allen	6/9/1997	21:00	Flash Flood		0	0	$0	$0
Plano	12/20/1997	20:00	Flash Flood		0	0	$0	$0
Mc Kinney	1/4/1998	16:40	Flash Flood		0	0	$0	$0
Mc Kinney	1/4/1998	16:45	Flash Flood		0	0	$0	$0
Blue Ridge	1/4/1998	16:50	Flash Flood		0	0	$0	$0
Princeton	1/4/1998	17:52	Flash Flood		0	0	$0	$0
Prosper	1/4/1998	21:09	Flash Flood		0	0	$0	$0
Nevada	12/4/1998	1:00	Flash Flood		0	0	$0	$0
Central Portion	12/4/1998	1:00	Flash Flood		0	0	$0	$0
Lavon	5/17/1999	15:33	Flash Flood		0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	6/8/1999	19:00	Flash Flood		0	0	$0	$0
Farmersville	6/4/2000	2:15	Flash Flood		0	0	$0	$0
Murphy	6/11/2000	12:55	Flash Flood		0	0	$0	$0
Wylie	6/15/2000	2:00	Flash Flood		0	0	$0	$0
Countywide	2/16/2001	1:34	Flash Flood		0	0	$0	$0
Countywide	2/16/2001	3:51	Flash Flood		0	0	$0	$0
Mc Kinney	5/6/2001	1:28	Flash Flood		0	0	$0	$0
Melissa	10/19/2002	2:05	Flash Flood		0	0	$25,000	$0
Plano	12/30/2002	14:30	Flash Flood		0	0	$0	$0
Plano	8/15/2005	19:45	Flash Flood		0	0	$0	$0
Countywide	3/19/2006	15:00	Flash Flood		0	0	$0	$0
McKinney	1/12/2007	17:15	Flash Flood		0	0	$0	$0
McKinney	3/30/2007	20:00	Flash Flood		0	0	$0	$0
Plano	4/3/2007	18:52	Flash Flood		0	0	$0	$0
Celina	4/24/2007	20:09	Flash Flood		0	0	$0	$0
Frisco	5/2/2007	19:00	Flash Flood		0	0	$50,000	$0
Lavon	5/27/2007	9:06	Flash Flood		0	0	$0	$0
McKinney	5/30/2007	8:30	Flash Flood		0	0	$10,000	$0
Anna	6/18/2007	2:00	Flash Flood		0	0	$10,000	$0
Melissa	6/18/2007	8:00	Flash Flood		0	0	$0	$0
Celina	6/26/2007	15:01	Flash Flood		0	0	$20,000	$0
Farmersville	6/27/2007	17:43	Flash Flood		0	0	$0	$0
Wylie	7/5/2007	13:30	Flash Flood		0	0	$0	$0
Plano	7/11/2007	16:42	Flash Flood		0	0	$0	$0
Plano	10/15/2007	7:42	Flash Flood		0	0	$80,000	$0
Plano	3/18/2008	11:54	Flash Flood		0	0	$0	$0
Biggers	3/18/2008	14:38	Flash Flood		0	0	$0	$0
Wylie	3/18/2008	16:54	Flash Flood		0	0	$0	$0
McKinney	3/18/2008	17:00	Flash Flood		0	0	$4,000	$0
Melissa	4/23/2008	22:55	Flash Flood		0	0	$2,000	$0
Parker	8/20/2008	6:00	Flash Flood		0	0	$0	$0
McKinney	8/20/2008	6:00	Flash Flood		0	0	$20,000	$0
Wylie	8/20/2008	6:45	Flash Flood		0	0	$4,000	$0
Forest Grove	8/20/2008	15:00	Flash Flood		0	0	$0	$0
Plano	5/2/2009	18:25	Flash Flood		0	0	$20,000	$0
McKinney	5/2/2009	20:38	Flash Flood		0	0	$2,000	$0
Blue Ridge	5/3/2009	4:05	Flash Flood		0	0	$0	$0
Celina	10/25/2009	21:21	Flash Flood		0	0	$3,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
McKinney	10/25/2009	22:44	Flash Flood		0	0	$3,000	$0
Desert	11/20/2009	11:00	Flood		0	0	$20,000	$0
Celina	1/25/2012	5:00	Flood		0	0	$50,000	$0
Lolaville	3/20/2012	0:00	Flood		0	0	$0	$0
Anna	7/31/2014	7:15	Flash Flood		0	0	$0	$0
Weston	5/9/2015	10:19	Flash Flood		0	0	$0	$0
Shepton	5/9/2015	11:13	Flash Flood		0	0	$0	$0
Shepton	5/9/2015	15:30	Flood		0	0	$0	$0
Fairview	5/17/2015	7:45	Flood		0	0	$0	$0
Allen	5/29/2015	5:14	Flash Flood		0	0	$0	$0
Plano Shiloh	5/29/2015	5:15	Flash Flood		0	0	$0	$0
Prosper	5/292015	8:30	Flash Flood		0	0	$0	$0
Shepton	5/30/2015	6:05	Flash Flood		0	0	$0	$0
Lavon	6/21/2015	7:29	Flash Flood		0	0	$1,000	$0
Celina	11/27/2015	6:45	Flood		0	0	$0	$0
Parker	12/26/2015	19:53	Flash Flood		0	0	$0	$0
Frisco	6/12/2016	16:40	Flash Flood		0	0	$0	$0
Celina	7/5/2017	19:50	Flash Flood		0	0	$0	$0
Princeton	7/5/2017	19:50	Flash Flood		0	0	$0	$0
Melissa	7/5/2017	19:56	Flash Flood		0	0	$0	$0
Lavon	8/17/2017	5:30	Flood		0	0	$0	$0
Lake Lavon	8/17/2017	7:27	Flood		0	0	$0	$0
Plano	9/21/2018	19:00	Flash Flood		0	0	$10,000	$0
Renner	9/21/2018	19:30	Flash Flood		0	0	$0	$0
Prosper	10/192018	15:00	Flood		0	0	$0	$0
Wylie	4/23/2019	22:02	Flash Flood		0	0	$10,000	$0
Fayburg	3/18/2020	4:15	Flash Flood		0	0	$0	$0
Totals:					0	0	$364,000	$0

Source: National Centers for Environmental Information

NFIP repetitive losses due to flood events. Some events may duplicate NCEI reported events.

Table 3.4 NFIP Losses Due to Flood Events

Location	Date	Type	Total Payments for Damages
Collin County	05/12/1982	Flood	$137,421.75
Collin County	10/13/1981	Flood	$56,653.53
Collin County	03/18/2008	Flood	$30,538.62
Collin County	03/19/2006	Flood	$2,804.32
Collin County	12/20/1991	Flood	$15,420.52
Fairview	03/15/1997	Flood	$8,234.44

Location	Date	Type	Total Payments for Damages
Fairview	06/01/1994	Flood	$10,533.74
Fairview	04/11/1991	Flood	$15,263.41
Fairview	01/31/1990	Flood	$8,844.92
Fairview	05/16/1989	Flood	$6,033.50
Fairview	01/04/1998	Flood	$5,701.14
Fairview	05/16/1989	Flood	$6,532.68
Murphy	04/12/1991	Flood	$69,726.51
Murphy	05/02/1990	Flood	$10,137.18
Murphy	05/17/1989	Flood	$37,866.00
Murphy	05/12/1982	Flood	$9,283.31
Murphy	10/31/1981	Flood	$14.429.25
Parker	04/12/1991	Flood	$4,962.09
Parker	05/02/1990	Flood	$4,880.80
Parker	04/11/1991	Flood	$9,256.63
Parker	05/02/1990	Flood	$2,298.37
Parker	08/20/2008	Flood	$20,750.05
Parker	12/29/2006	Flood	$15,835.07
Parker	04/11/1991	Flood	$24,872.33
Parker	05/02/1990	Flood	$8,110.35
Parker	05/16/1989	Flood	$30,207.89
Parker	08/19/2008	Flood	$118,111.47
Parker	04/11/1991	Flood	$45,394.51
Parker	05/01/1990	Flood	$2,971.26
Parker	05/16/1989	Flood	$8,714.54

As observed in Table 3.3, Historical Losses Due to Flood Events, calculations of annualized losses were conducted using historical data obtained from National Centers for Environmental Information. The annualized loss value can be interpreted as the impact expected from flooding in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.3*, Collin County can expect a total property loss of $15,166.67 each year as a result of flooding, with no injuries, no fatalities, and no crop losses. Property damage and crop damage values may be underestimated due to lack of accurate reporting.

In order to assess flood risk and vulnerability of the identified assets, a Geographic Information System-based analysis was conducted to estimate exposure to flood events using Federal Emergency Management Agency's digital 100-year floodplain in combination with Collin County Central Appraisal District property records and the geo-referenced assets provided by Regional Hazard Assessment Tool.

By overlaying the geo-referenced assets and the floodplain layers using Geographic Information System, the number of emergency facilities, critical facilities, and critical infrastructure located within the 100-year floodplain was calculated. Although, having a facility located within the floodplain does not necessarily imply that would be impacted by the 100-year storm event (e.g., the building could be flood-proofed, or

the buildings may be constructed above the 100-year elevation), it provides with a good approximation of potential impacts from flooding.

According to the analysis conducted, no emergency or critical facilities are located within the 100-year floodplain. Critical infrastructure located within the 100-year floodplain is presented in *Table 3.5.*

Table 3.5 Critical Infrastructure Located in 100-year FEMA Floodplain

Jurisdiction	Critical Infrastructure											
	Railway/ Highway Bridges		Dams		Water Treatment Facilities		Waste Water Treatment Facilities		Natural Gas		Airports	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Collin County	142	34.4 %	67	48.6 %	0	0%	13	61.9%	0	0%	0	0%
Total	**142**	**34.4 %**	**67**	**48.6 %**	**0**	**0%**	**13**	**61.9%**	**0**	**0%**	**0**	**0%**

Source: Regional Hazard Assessment Tool and local jurisdictions

As noted in *Table 3.5*, the total and percentage of critical infrastructure located within the 100-year floodplain corresponds to approximately 48.6% of dams and 61.9% of wastewater treatment works. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain. However, some of the critical facilities located within the 100-year floodplain may be subject to impacts from flooding.

Vulnerability to flooding can also be measured by assessing the number of people and buildings exposed to flood events. *Table 3.6* shows Residential Parcels and Improved Property at risk from flooding events.

The determination of residential parcel vulnerability was calculated by adding the total residential parcel counts from 2013 that had at least some portion located within the 100-year floodplain. The determination of commercial and utility property value at-risk (exposure) was calculated adding the total assessed building values for only those parcels that were confirmed to have at least one building located within the 100-year floodplain.

Table 3.6 Residential Parcels and Buildings potentially located within the 100-year FEMA Floodplain

Jurisdiction	Residential Parcels located in the 100-year Floodplain	Percentage of Total Residential Parcels located in the 100-year Floodplain	Commercial and Utility parcels in the 100-year Floodplain	Percentage of Commercial and Utility Parcels in the 100-year Floodplain
Collin County*	989	4.67%	72	9.41%

Jurisdiction	Residential Parcels located in the 100-year Floodplain	Percentage of Total Residential Parcels located in the 100-year Floodplain	Commercial and Utility parcels in the 100-year Floodplain	Percentage of Commercial and Utility Parcels in the 100-year Floodplain
Allen	350	1.13%	71	6.31%
Anna	139	1.82%	8	3.56%
Blue Ridge	18	3.65%	3	4.17%
Celina	332	4.16%	22	8.43%
Fairview	280	7.52%	2	2.02%
Farmersville	79	5.25%	21	7.00%
Frisco	410	1.22%	142	7.28%
Josephine	92	10.13%	23	60.53%
Lavon	14	0.66%	2	3.28%
Lowry Crossing	128	20.03%	2	9.52%
Lucas	335	12.84%	4	5.8%
Melissa	54	0.91%	8	4.02%
Murphy	185	3.10%	19	11.24%
New Hope	2	0.73%	1	11.11%
Parker	230	12.09%	10	38.46%
Princeton	101	1.31%	13	5.28%
Prosper	152	1.86%	36	10.34%
St. Paul	3	0.82%	1	2.56%
Wylie	427	2.7%	80	10.61%
Total	**4,320**	**2.71%**	**543**	**7.96%**

Source: Regional Hazard Assessment Tool, National Centers for Environmental Information , and local jurisdictions
**Collin County unincorporated areas*

As it can be observed in *Table 3.6*, approximately 2.71% of the residential parcels in Collin County, and 7.96% of its commercial and utility parcels are located within the 100-year floodplain.

Since Collin County is composed by large areas used for cropland, an analysis was conducted to determine the vulnerability of the land to flooding relative to the type of land cover (*Table 3.7*). The calculations were made using Geographic Information System. The USGS land cover shapefile was

clipped with the 100-year floodplain to calculate the area (acreage) of each land cover type potentially affected by flooding. Reservoirs, streams, and channels were excluded from the calculations.

Table 3.7 Land Cover Types and Acreage located within the 100-year FEMA Floodplain

Land Cover Type	Total Areas For Collin County (Acres)	Total Area Affected By 100-year Flood (Acres)	Percentage of Area Affected By 100-year Flood (%)
Commercial	53,547.25	17,666.73	32.99
Utilities	4674.94	1671.4	35.75%
Residential	114,382.69	13,086.41	11.44%
Farmland/Undeveloped	340,108.98	186,590.25	54.86%
Total	**512,713.86**	**219,014.79**	**42.72%**

Source: USGS

As observed, on average approximately 42.72% of the total area of Collin County is located within the 100-year floodplain. Note, that a higher percentage than the average of the total farm and undeveloped land (54.86%) located within the floodplain, while commercial (32.99%), utilities (35.75%), and residential (11.44%) are all below the total average area.

In compliance to *Requirement 201.6(c)(2)(ii)* Collin County vulnerability from flooding and impacts to assets expected from flooding can be summarized as follows:

- **Population**: Based on historical data, flooding produces an expected annualized zero injuries and fatalities per year. In total, portions of the Collin County population are vulnerable to the 100-year floodplain.
- **Improved Property**: Based on historical data, a loss of $15,166.67 per year can be expected in property loss due to flooding with no expected crop losses, however these values could be underestimated due to lack of accurate reporting. Based on geographic information and assuming that a facility within the 100-year floodplain is exposed to impact, 2.40% of the total assessed value of improvements in Collin County is at risk from the 100-year storm event.
- **Emergency Facilities**: Based on geographic information and assuming that a facility within the 100-year floodplain is exposed to impact, there are no emergency facilities at imminent risk from the 100-year storm event.
- **Critical Facilities**: Based on geographic information and assuming that a facility within the 100-year floodplain is exposed to impact, there are no critical facilities at imminent risk from the 100-year storm event.
- **Critical Infrastructure**: Based on geographic information and assuming that a critical infrastructure within the 100-year floodplain is exposed to impact, 13 wastewater treatment facilities and 142 railway and highway bridges are at risk from the 100-year storm event. Note that treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C),* which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Repetitive Loss

As per Requirement 201.6(c)(2)(ii) “The risk assessments in all plans approved after October 1, 2008 must also address National Flood Insurance Program (NFIP) insured structures that have been

repetitively damaged by floods." Repetitive Loss Property information provides local jurisdictions with the properties that had submitted insurance claims due to flooding damage to buildings and its contents. The information provided by Federal Emergency Management Agency included repetitive loss properties in Collin County as of 5/31/2014 (*Table 3.8*).

Address information available for repetitive loss properties recorded allowed those properties to be geo-referenced using ESRI® ArcMap™ 10.2. The probability of future repetitive losses on those properties was estimated using Geographic Information System by overlying the geo-referenced properties with the 100-year floodplain layer. *Table 3.8* summarizes with the number of properties located within the 100-year floodplain as obtained using this approach.

Table 3.8 Repetitive Loss Properties located within the 100-year FEMA Floodplain

Jurisdiction	Total Number of Repetitive Loss Properties	Properties within 100-year Floodplain			Total Number of Repetitive Loss Properties Within 100-year Floodplain	Percent of Repetitive Loss Properties Within 100-year Floodplain
		Single Family	Other Residential	Non Residential		
Collin County*	2	2	0	0	1	50%
Allen	0	0	0	0	0	0
Anna	0	0	0	0	0	0
Blue Ridge	0	0	0	0	0	0
Celina	0	0	0	0	0	0
Fairview	2	2	0	0	1	50%
Farmersville	0	0	0	0	0	0
Frisco	0	0	0	0	0	0
Josephine	0	0	0	0	0	0
Lavon	0	0	0	0	0	0
Lowry Crossing	0	0	0	0	0	0
Lucas	0	0	0	0	0	0
Melissa	0	0	0	0	0	0
Murphy	1	1	0	0	1	100%
New Hope	0	0	0	0	0	0
Parker	5	5	0	0	5	100%
Princeton	0	0	0	0	0	0
Prosper	0	0	0	0	0	0
St. Paul	0	0	0	0	0	0
Wylie	0	0	0	0	0	0
Total	**10**	**10**	**0**	**0**	**8**	**80%**

Source: Federal Emergency Management Agency

As noted in *Table 3.8* there are few repetitive loss properties located within the 100-year floodplain in Unincorporated Collin County and all participating jurisdictions. In compliance with *Requirement 201.6(c)(2)(ii)*, Table 3.7 provides the type (residential, commercial, institutional, etc.) and numbers of repetitive loss properties located in the identified flood hazard zones within Collin County.

Table 3.9 shows the repetitive loss property statistics for the zero properties recorded in the Collin County classified by jurisdiction. The numbers provided can be used to estimate the vulnerability to repetitive loss properties in terms of dollar losses.

Table 3.9 Repetitive Loss Property Statistics

Unincorporated Collin County	Years	Properties	Number of losses	Payments
Single Family	1981, 1982, 1991, 2006, 2008	2	5	$242,838.74
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	1981, 1982, 1991, 2006, 2008	2	5	$242,838.74

Allen	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Anna	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Blue Ridge	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Celina	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00

Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Fairview	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	1989-1991, 1994, 1997, 1998	2	7	$61,143.83
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	1989-1991, 1994, 1997, 1998	2	7	$61,143.83

Farmersville	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Frisco	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Josephine	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Lavon	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00

Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Lowry Crossing	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Lucas	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Melissa	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Murphy	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	1981, 1982, 1989, 1990	1	5	$141,442.25
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

New Hope	**Years**	**Properties**	**Number of losses**	**Payments**
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00

Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Parker	Years	Properties	Number of losses	Payments
Single Family	1989, 1990, 1991, 2006, 2008	5	13	$296,365.36
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	1989, 1990, 1991, 2006, 2008	5	13	$296,365.36

Princeton	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Prosper	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

St. Paul	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00
Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Wylie	Years	Properties	Number of losses	Payments
Single Family	0	0	0	$0.00
Other Residential	0	0	0	$0.00

Non Residential	0	0	0	$0.00
Total	0	0	0	$0.00

Source: Federal Emergency Management Agency

The dollar amounts in the tables represent the payments made for insurance claims due to flood damage to buildings and contents.

Although both repetitive loss information (*Tables 3.8 and 3.9*) and the historical annualized losses expected from flooding (*Table 3.3*) represent actual historical information, the data cannot be compared or correlated to each other. The repetitive loss information presents insurance claims on properties and buildings, whereas the historical annualized losses represent property losses in the community due to flood events.

Hail

As described in section 3.3, damage from hail events is determined by the intensity of the storm, which, based on the hail diameter, ranges from hard hail to super hailstorm. These events are unpredictable, and all areas Collin County can be affected. All five categories of assets are exposed to this hazard and could potentially be impacted. However, the most vulnerable assets are those related to property and infrastructure, particularly roofs and structures. Damages from hail can potentially translate into significant insurance claims and expenses.

Based on the available information, vulnerability to hail was assessed using two techniques: (1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental Information was used to predict expected monetary and human losses from the event; (2) in fulfillment of Element A of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for hail and the nature of the impacts expected from hail were used to identify the assets, including existing structures, vulnerable to this hazard event. The vulnerability to future structures was not conducted at this time due to unattainable data. Therefore, compliance with Element B of *Requirement 201.6(c)(2)(ii)(A,* describing vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities will be an objective in the five-year planning cycle.

Table 3.10 presents Collin County's recorded historical losses due to hailstorm events as provided in the hazard events database obtained from the National Centers for Environmental Information. Based on the starting location of the hailstorm event, these events were geo-referenced using ESRI® ArcMap™ 10.2. The resulting layer was overlaid with the jurisdiction boundary layer to determine the property and personal losses in each jurisdiction.

Table 3.10 Historical Losses Due to Hail Events (1/1/1985-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	4/29/1985	20:58	Hail	0.75 in.	0	0	$0	$0
Collin Co.	7/2/1985	15:35	Hail	0.75 in.	0	0	$0	$0
Collin Co.	3/11/1986	18:58	Hail	1.75 in.	0	0	$0	$0
Collin Co.	4/12/1986	0:15	Hail	1.75 in.	0	0	$0	$0
Collin Co.	4/12/1986	0:50	Hail	1.00 in.	0	0	$0	$0
Collin Co.	5/24/1986	10:00	Hail	0.75 in.	0	0	$0	$0
Collin Co.	5/24/1986	10:34	Hail	1.00 in.	0	0	$0	$0
Collin Co.	5/3/1987	21:03	Hail	0.75 in.	0	0	$0	$0
Collin Co.	5/14/1987	15:10	Hail	0.75 in.	0	0	$0	$0
Collin Co.	7/2/1987	23:30	Hail	1.50 in.	0	0	$0	$0
Collin Co.	4/1/1988	14:02	Hail	1.00 in.	0	0	$0	$0
Collin Co.	4/5/1988	16:35	Hail	0.75 in.	0	0	$0	$0
Collin Co.	5/8/1988	6:50	Hail	0.75 in.	0	0	$0	$0
Collin Co.	11/15/1988	15:00	Hail	1.00 in.	0	0	$0	$0
Collin Co.	11/15/1988	15:29	Hail	1.75 in.	0	0	$0	$0
Collin Co.	4/28/1989	19:25	Hail	0.75 in.	0	0	$0	$0
Collin Co.	4/28/1989	20:10	Hail	0.75 in.	0	0	$0	$0
Collin Co.	4/28/1989	20:30	Hail	1.00 in.	0	0	$0	$0
Collin Co.	4/28/1989	21:50	Hail	1.00 in.	0	0	$0	$0
Collin Co.	7/2/1989	15:43	Hail	1.00 in.	0	0	$0	$0
Collin Co.	7/2/1989	16:06	Hail	4.50 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	7/2/1989	16:21	Hail	1.75 in.	0	0	$0	$0
Collin Co.	4/15/1990	20:52	Hail	1.00 in.	0	0	$0	$0
Collin Co.	4/27/1990	15:00	Hail	0.75 in.	0	0	$0	$0
Collin Co.	4/27/1990	15:30	Hail	1.75 in.	0	0	$0	$0
Collin Co.	3/22/1991	6:12	Hail	0.75 in.	0	0	$0	$0
Collin Co.	4/18/1991	18:12	Hail	1.00 in.	0	0	$0	$0
Collin Co.	4/27/1991	2:30	Hail	0.75 in.	0	0	$0	$0
Collin Co.	6/22/1991	19:10	Hail	1.75 in.	0	0	$0	$0
Collin Co.	6/22/1991	19:20	Hail	2.00 in.	0	0	$0	$0
Collin Co.	10/28/1991	16:45	Hail	0.75 in.	0	0	$0	$0
Collin Co.	3/24/1992	14:05	Hail	1.74 in.	0	0	$0	$0
Collin Co.	5/11/1992	20:16	Hail	0.75 in.	0	0	$0	$0
Collin Co.	5/11/1992	20:28	Hail	1.75 in.	0	0	$0	$0
Collin Co.	5/11/1992	21:15	Hail	1.75 in.	0	0	$0	$0
Collin Co.	5/11/1992	21:30	Hail	1.75 in.	0	0	$0	$0
Collin Co.	5/11/1992	21:45	Hail	1.75 in.	0	0	$0	$0
Collin Co.	5/11/1992	22:00	Hail	0.75 in.	0	0	$0	$0
Collin Co.	5/14/1992	9:15	Hail	1.75 in.	0	0	$0	$0
Collin Co.	6/10/1992	21:55	Hail	0.75 in.	0	0	$0	$0
Collin Co.	6/25/1992	4:30	Hail	1.75 in.	0	0	$0	$0
Collin Co.	8/2/1992	15:12	Hail	0.75 in.	0	0	$0	$0
Collin Co.	8/2/1992	15:47	Hail	0.88 in.	0	0	$0	$0
Collin Co.	9/2/1992	23:15	Hail	0.75 in.	0	0	$0	$0
Collin Co.	9/2/1992	23:20	Hail	0.75 in.	0	0	$0	$0
Collin Co.	9/3/1992	0:15	Hail	0.75 in.	0	0	$0	$0
Collin Co.	10/7/1992	16:12	Hail	1.75 in.	0	0	$0	$0
Wylie	4/19/1993	17:15	Hail	0.88 in.	0	0	$0	$0
Garland	4/19/1993	18:00	Hail	1.00 in.	0	0	$0	$0
Airport	4/19/1993	18:30	Hail	1.75 in.	0	0	$0	$0
Love Field	4/19/1993	18:30	Hail	1.75 in.	0	0	$0	$0
Plano	9/20/1993	17:50	Hail	1.00 in.	0	0	$0	$0
Melissa	10/19/1993	4:00	Hail	0.75 in.	0	0	$0	$0
Frisco	4/25/1994	18:25	Hail	0.88 in.	0	0	$0	$0
McKinney	4/29/1994	1:45	Hail	1.00 in.	0	0	$0	$0
Wylie	5/2/1994	13:56	Hail	0.75 in.	0	0	$0	$0
Frisco	5/2/1994	14:20	Hail	0.75 in.	0	0	$0	$0
Lake Lavon	5/14/1994	17:40	Hail	0.75 in.	0	0	$0	$0
Farmersville	5/14/1994	18:01	Hail	0.75 in.	0	0	$0	$0
Nevada	5/14/1994	19:23	Hail	0.75 in.	0	0	$0	$0
Allen	7/12/1994	19:50	Hail	0.75 in.	0	0	$0	$0
Plano	7/15/1994	17:39	Hail	0.75 in.	0	0	$0	$0
Plano	8/7/1994	13:25	Hail	0.75 in.	0	0	$0	$0
Plano	10/21/1994	12:45	Hail	0.75 in.	0	0	$0	$0
Plano	10/21/1994	13:33	Hail	0.75 in.	0	0	$0	$0
Meridian	4/22/1995	15:39	Hail	0.75 in.	0	0	$0	$0
Plano	4/22/1995	15:40	Hail	1.75 in.	0	0	$0	$0
Westminster	5/1/1995	1:08	Hail	0.75 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
McKinney	5/7/1995	22:40	Hail	0.75 in.	0	0	$0	$0
Plano	5/24/1995	16:37	Hail	1.75 in.	0	0	$0	$0
Anna	5/24/1995	17:05	Hail	0.75 in.	0	0	$0	$0
Princeton	5/25/1995	17:05	Hail	1.00 in.	0	0	$0	$0
Farmersville	2/27/1996	9:15	Hail	0.75 in.	0	0	$0	$0
Copeville	2/27/1996	10:15	Hail	0.75 in.	0	0	$0	$0
Allen	3/18/1996	0:10	Hail	0.75 in.	0	0	$0	$0
Plano	3/24/1996	15:10	Hail	0.75 in.	0	0	$0	$0
Plano	3/24/1996	15:20	Hail	1.00 in.	0	0	$0	$0
Plano	3/24/1996	15:27	Hail	1.25 in.	0	0	$0	$0
Mc Kinney	3/24/1996	15:40	Hail	0.75 in.	0	0	$0	$0
Princeton	4/4/1996	1:40	Hail	0.88 in.	0	0	$0	$0
Mc Kinney	4/12/1996	12:38	Hail	0.88 in.	0	0	$0	$0
Anna	4/12/1996	12:38	Hail	0.88 in.	0	0	$0	$0
Frisco	4/12/1996	16:45	Hail	0.75 in.	0	0	$0	$0
Anna	4/12/1996	16:48	Hail	0.75 in.	0	0	$0	$0
Wylie	4/12/1996	17:26	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	4/13/1996	21:39	Hail	0.88 in.	0	0	$0	$0
Weston	4/13/1996	21:48	Hail	1.00 in.	0	0	$0	$0
Murphy	4/13/1996	22:08	Hail	0.75 in.	0	0	$0	$0
Lucas	5/27/1996	4:14	Hail	1.00 in.	0	0	$0	$0
Murphy	5/28/1996	17:42	Hail	1.50 in.	0	0	$0	$0
Culleoka	5/28/1996	18:10	Hail	1.00 in.	0	0	$0	$0
Plano	6/12/1996	17:10	Hail	1.00 in.	0	0	$0	$0
Mc Kinney	6/17/1996	16:50	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	6/17/1996	16:55	Hail	0.88 in.	0	0	$0	$0
Mc Kinney	7/23/1996	12:30	Hail	0.75 in.	0	0	$0	$0
Princeton	7/30/1996	19:08	Hail	1.75 in.	0	0	$0	$0
Plano	10/21/1996	10:50	Hail	0.75 in.	0	0	$0	$0
Plano	10/21/1996	14:35	Hail	2.00 in.	0	0	$0	$0
Plano	10/21/1996	14:50	Hail	2.00 in.	0	0	$0	$0
Prosper	4/22/1997	3:30	Hail	1.00 in.	0	0	$0	$0
Celina	5/25/1997	22:04	Hail	1.00 in.	0	0	$0	$0
Plano	6/9/1997	20:14	Hail	1.00 in.	0	0	$0	$0
Plano	6/9/1997	20:19	Hail	0.75 in.	0	0	$0	$0
Allen	6/9/1997	20:19	Hail	0.75 in.	0	0	$0	$0
Plano	6/9/1997	20:45	Hail	1.00 in.	0	0	$0	$0
Plano	6/16/1997	19:03	Hail	0.75 in.	0	0	$0	$0
Plano	6/16/1997	19:10	Hail	0.88 in.	0	0	$0	$0
Anna	8/13/1997	16:10	Hail	0.88 in.	0	0	$0	$0
Mc Kinney	1/4/1998	16:22	Hail	0.75 in.	0	0	$0	$0
Allen	1/4/1998	16:25	Hail	1.00 in.	0	0	$0	$0
Branch	1/4/1998	16:30	Hail	1.00 in.	0	0	$0	$0
Murphy	1/21/1998	16:25	Hail	1.00 in.	0	0	$0	$0
Anna	2/25/1998	19:39	Hail	0.75 in.	0	0	$0	$0
Prosper	2/25/1998	19:40	Hail	0.75 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Celina	4/16/1998	0:30	Hail	1.75 in.	0	0	$0	$0
Desert	5/2/1998	21:28	Hail	1.00 in.	0	0	$0	$0
Anna	5/2/1998	21:35	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	5/8/1998	20:25	Hail	1.00 in.	0	0	$0	$0
Frisco	5/8/1998	20:35	Hail	1.75 in.	0	0	$0	$0
Mc Kinney	5/8/1998	20:53	Hail	0.75 in.	0	0	$0	$0
Melissa	5/8/1998	20:54	Hail	1.75 in.	0	0	$0	$0
Frisco	5/8/1998	21:26	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	5/8/1998	21:54	Hail	1.75 in.	0	0	$0	$0
Mc Kinney	5/8/1998	21:55	Hail	1.75 in.	0	0	$0	$0
Blue Ridge	10/2/1998	18:20	Hail	1.00 in.	0	0	$0	$0
Frisco	2/6/1999	19:54	Hail	1.75 in.	0	0	$0	$0
Farmersville	2/6/1999	20:50	Hail	0.75 in.	0	0	$0	$0
Celina	4/3/1999	5:11	Hail	1.00 in.	0	0	$0	$0
Weston	5/4/1999	12:10	Hail	1.00 in.	0	0	$0	$0
Wylie	5/25/1999	18:18	Hail	1.00 in.	0	0	$0	$0
Lavon	2/25/2000	23:17	Hail	0.75 in.	0	0	$0	$0
Prosper	3/2/2000	18:10	Hail	1.75 in.	0	0	$0	$0
Plano	3/2/2000	18:15	Hail	1.00 in.	0	0	$0	$0
Plano	3/2/2000	18:24	Hail	1.75 in.	0	0	$0	$0
Mc Kinney	3/2/2000	18:29	Hail	1.00 in.	0	0	$0	$0
Farmersville	3/2/2000	18:50	Hail	1.00 in.	0	0	$0	$0
Plano	3/10/2000	10:45	Hail	0.75 in.	0	0	$0	$0
Wylie	3/16/2000	21:28	Hail	0.75 in.	0	0	$0	$0
Parker	5/12/2000	16:40	Hail	0.75 in.	0	0	$0	$0
Wylie	5/27/2000	16:50	Hail	0.75 in.	0	0	$0	$0
Plano	3/11/2001	14:40	Hail	0.88 in.	0	0	$0	$0
Plano	5/6/2001	18:22	Hail	1.00 in.	0	0	$0	$0
Plano	5/6/2001	18:43	Hail	3.00 in.	0	0	$0	$0
Allen	5/6/2001	19:00	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	4/16/2002	23:15	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	5/9/2002	23:10	Hail	0.75 in.	0	0	$0	$0
Frisco	12/30/2002	13:30	Hail	1.75 in.	0	0	$0	$0
Plano	12/30/2002	14:30	Hail	1.00 in.	0	0	$0	$0
Plano	4/5/2003	22:16	Hail	2.00 in.	0	0	$0	$0
Plano	4/5/2003	22:32	Hail	3.00 in.	0	0	$0	$0
Plano	4/6/2003	12:55	Hail	1.00 in.	0	0	$0	$0
Plano	4/6/2003	13:00	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	5/13/2003	5:22	Hail	1.00 in.	0	0	$0	$0
Nevada	5/24/2003	21:30	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	5/24/2003	22:47	Hail	1.00 in.	0	0	$0	$0
Allen	6/14/2003	16:23	Hail	1.50 in.	0	0	$0	$0
Plano	6/14/2003	16:40	Hail	1.00 in.	0	0	$0	$0
Celina	7/2/2003	16:15	Hail	0.75 in.	0	0	$0	$0
Anna	7/22/2003	15:46	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	7/22/2003	16:22	Hail	1.00 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	7/22/2003	16:45	Hail	0.75 in.	0	0	$0	$0
Mc Kinney	6/5/2004	16:35	Hail	1.75 in.	0	0	$0	$0
Frisco	6/19/2004	13:22	Hail	0.88 in.	0	0	$0	$0
Plano	1/12/2005	17:15	Hail	1.25 in.	0	0	$0	$0
Wylie	2/22/2005	23:21	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	2/23/2005	0:15	Hail	0.75 in.	0	0	$0	$0
Westminster	2/23/2005	0:25	Hail	1.75 in.	0	0	$0	$0
Plano	4/5/2005	15:50	Hail	1.00 in.	0	0	$0	$0
Frisco	4/5/2005	16:00	Hail	0.88 in.	0	0	$0	$0
Frisco	4/5/2005	16:12	Hail	0.75 in.	0	0	$0	$0
Frisco	4/5/2005	16:14	Hail	1.00 in.	0	0	$0	$0
Anna	4/5/2005	16:58	Hail	1.75 in.	0	0	$0	$0
Blue Ridge	4/5/2005	17:50	Hail	1.00 in.	0	0	$0	$0
Plano	5/25/2005	12:30	Hail	0.75 in.	0	0	$0	$0
Farmersville	6/13/2005	22:52	Hail	0.88 in.	0	0	$0	$0
Melissa	5/9/2006	21:04	Hail	1.75 in.	0	0	$5,000	$0
Plano	4/3/2007	18:05	Hail	1.25 in.	0	0	$0	$0
Plano	4/3/2007	18:23	Hail	1.00 in.	0	0	$0	$0
Melissa	4/24/2007	14:26	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	4/24/2007	14:52	Hail	1.75 in.	0	0	$5,000	$0
McKinney	5/30/2007	8:45	Hail	0.75 in.	0	0	$0	$0
Murphy	5/30/2007	9:05	Hail	0.75 in.	0	0	$0	$0
Wylie	6/4/2007	14:50	Hail	0.88 in.	0	0	$0	$0
Melissa	6/9/2007	13:44	Hail	0.88 in.	0	0	$0	$0
Westminster	6/20/2007	5:05	Hail	1.00 in.	0	0	$0	$0
Anna	2/5/2008	2:20	Hail	1.75 in.	0	0	$5,000	$0
Wylie	2/5/2008	14:00	Hail	0.75 in.	0	0	$0	$0
Allen	2/16/2008	6:40	Hail	1.00 in.	0	0	$0	$0
McKinney	2/16/2008	6:40	Hail	1.75 in.	0	0	$25,000	$0
Foot	2/16/2008	6:45	Hail	1.00 in.	0	0	$0	$0
Melissa	2/16/2008	6:47	Hail	1.00 in.	0	0	$0	$0
Anna	2/16/2008	6:54	Hail	1.75 in.	0	0	$5,000	$0
McKinney	4/4/2008	1:15	Hail	1.75 in.	0	0	$10,000	$0
Plano	4/4/2008	2:40	Hail	1.00 in.	0	0	$0	$0
Allen	4/4/2008	2:50	Hail	1.00 in.	0	0	$0	$0
Plano	4/8/2008	22:20	Hail	1.00 in.	0	0	$0	$0
Allen	4/8/2008	22:33	Hail	0.75 in.	0	0	$0	$0
Lucas	4/8/2008	22:48	Hail	0.88 in.	0	0	$0	$0
Copeville	4/8/2008	23:19	Hail	1.00 in.	0	0	$0	$0
Shepton	4/8/2008	23:44	Hail	0.75 in.	0	0	$0	$0
Princeton	4/17/2008	21:01	Hail	0.88 in.	0	0	$0	$0
Anna	5/7/2008	16:19	Hail	0.88 in.	0	0	$0	$0
Melissa	5/7/2008	16:30	Hail	1.75 in.	0	0	$5,000	$0
Celina	6/28/2008	16:50	Hail	0.75 in.	0	0	$0	$0
Melissa	2/10/2009	22:03	Hail	1.00 in.	0	0	$0	$0
Celina	4/12/2009	22:09	Hail	1.00 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Melissa	4/12/2009	22:32	Hail	1.00 in.	0	0	$2,000	$0
McKinney	5/2/2009	13:47	Hail	1.00 in.	0	0	$0	$0
Melissa	5/2/2009	19:10	Hail	1.25 in.	0	0	$0	$0
Parker	7/19/2009	13:15	Hail	0.75 in.	0	0	$0	$0
Farmersville	10/24/2010	15:41	Hail	2.00 in.	0	0	$500	$0
Allen	3/15/2011	15:10	Hail	0.88 in.	0	0	$0	$0
Plano	4/4/2011	4:04	Hail	0.75 in.	0	0	$0	$0
Rockhill	4/10/2011	23:29	Hail	1.50 in.	0	0	$10,000	$0
Prosper	4/10/2011	23:34	Hail	2.75 in.	0	0	$200,000	$0
Plano	4/14/2011	21:39	Hail	1.00 in.	0	0	$0	$0
Shepton	4/14/2011	21:40	Hail	1.25 in.	0	0	$20,000	$0
Shepton	4/14/2011	21:45	Hail	1.75 in.	0	0	$25,000	$0
Plano	4/14/2011	21:48	Hail	1.00 in.	0	0	$0	$0
Allen	4/14/2011	21:49	Hail	1.00 in.	0	0	$0	$0
Melissa	4/14/2011	22:32	Hail	0.88 in.	0	0	$0	$0
Plano	4/19/2011	16:25	Hail	1.25 in.	0	0	$0	$0
Prosper	4/24/2011	18:53	Hail	1.75 in.	0	0	$15,000	$0
Wylie	4/24/2011	21:35	Hail	1.00 in.	0	0	$0	$0
Wylie	4/25/2011	9:48	Hail	1.00 in.	0	0	$0	$0
Melissa	4/25/2011	15:04	Hail	0.75 in.	0	0	$0	$0
Wylie	4/26/2011	16:28	Hail	1.00 in.	0	0	$0	$0
Plano	5/1/2011	22:03	Hail	0.88 in.	0	0	$0	$0
Plano	5/1/2011	22:05	Hail	0.75 in.	0	0	$0	$0
Wylie	5/2/2011	0:18	Hail	1.25 in.	0	0	$0	$0
Frisco	5/2/2011	1:20	Hail	0.75 in.	0	0	$0	$0
Shepton	5/20/2011	13:25	Hail	0.88 in.	0	0	$0	$0
Shepton	5/20/2011	13:25	Hail	1.25 in.	0	0	$0	$0
Plano	5/20/2011	14:19	Hail	1.00 in.	0	0	$0	$0
Lucas	5/20/2011	15:58	Hail	1.50 in.	0	0	$0	$0
Renner	5/23/2011	11:39	Hail	0.88 in.	0	0	$0	$0
Celina	5/24/2011	20:48	Hail	2.00 in.	0	0	$25,000	$0
Frisco	5/24/2011	21:10	Hail	0.88 in.	0	0	$0	$0
Prosper	9/18/2011	18:05	Hail	1.00 in.	0	0	$0	$0
McKinney	9/18/2011	18:25	Hail	1.00 in.	0	0	$0	$0
McKinney	9/18/2011	18:38	Hail	1.25 in.	0	0	$0	$0
Plano	9/18/2011	19:01	Hail	1.00 in.	0	0	$0	$0
Shepton	10/17/2011	20:25	Hail	0.75 in.	0	0	$0	$0
McKinney	10/23/2011	0:20	Hail	0.75 in.	0	0	$0	$0
Frisco	4/3/2012	13:50	Hail	1.75 in.	0	0	$800,000	$0
Frisco	4/3/2012	13:50	Hail	2.00 in.	0	0	$1,000,000	$0
Allen	4/3/2012	16:10	Hail	1.00 in.	0	0	$0	$0
Allen	5/14/2012	17:53	Hail	0.88 in.	0	0	$0	$0
Plano	5/30/2012	22:30	Hail	0.75 in.	0	0	$0	$0
Murphy	5/30/2012	22:45	Hail	0.75 in.	0	0	$0	$0
Plano	6/6/2012	14:50	Hail	0.75 in.	0	0	$0	$0
Frisco	6/6/2012	15:12	Hail	1.50 in.	0	0	$0	$0
Frisco	6/6/2012	15:15	Hail	0.75 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Wylie	6/6/2012	15:50	Hail	1.00 in.	0	0	$0	$0
Shepton	6/13/2012	16:45	Hail	1.75 in.	0	0	$80,000	$0
Shepton	6/13/2012	16:52	Hail	2.00 in.	0	0	$75,000	$0
McKinney	6/13/2012	19:03	Hail	1.00 in.	0	0	$60,000	$0
Parker	6/13/2012	19:34	Hail	3.25 in.	0	0	$800,000	$0
Shepton	8/17/2012	20:52	Hail	1.00 in.	0	0	$0	$0
Shepton	8/17/2012	20:53	Hail	1.00 in.	0	0	$0	$0
Shepton	8/17/2012	20:54	Hail	0.88 in.	0	0	$0	$0
Shepton	8/17/2012	21:00	Hail	1.25 in.	0	0	$0	$0
Shepton	8/17/2012	21:13	Hail	1.50 in.	0	0	$2,000	$0
Plano	8/17/2012	21:15	Hail	0.88 in.	0	0	$0	$0
Foot	3/23/2013	14:09	Hail	0.88 in.	0	0	$0	$0
Valdasta	3/31/2013	6:34	Hail	0.88 in.	0	0	$0	$0
Prosper	3/31/2013	6:43	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	3/31/2013	6:50	Hail	1.00 in.	0	0	$0	$0
Farmersville	3/31/2013	7:20	Hail	0.88 in.	0	0	$0	$0
McKinney	3/27/2014	19:18	Hail	1.50 in.	0	0	$5,000	$0
Princeton	3/27/2014	19:24	Hail	1.00 in.	0	0	$0	$0
Farmersville	3/27/2014	19:43	Hail	0.75 in.	0	0	$0	$0
Blue Ridge	3/28/2014	14:23	Hail	1.50 in.	0	0	$3,000	$0
Anna	4/3/3014	15:53	Hail	1.00 in.	0	0	$0	$0
Anna	4/3/3014	16:02	Hail	.75 in.	0	0	$0	$0
Prosper	4/3/3014	17:48	Hail	1.00 in.	0	0	$5,000	$0
Celina	4/3/3014	17:49	Hail	1.50 in.	0	0	$0	$0
Roland	4/3/3014	18:15	Hail	1.75 in.	0	0	$0	$0
Mc Kinney	4/3/3014	18:37	Hail	1.00 in.	0	0	$0	$0
Frisco	4/3/3014	18:40	Hail	1.50 in.	0	0	$60,000	$0
Allen	4/3/3014	18:50	Hail	1.75 in.	0	0	$70,000	$0
Allen	4/3/3014	19:00	Hail	1.25 in.	0	0	$0	$0
McKinney	4/3/3014	19:00	Hail	2.00 in.	0	0	$100,000	$0
Allen	4/3/3014	19:07	Hail	2.00 in.	0	0	$80,000	$0
Melissa	4/3/3014	19:18	Hail	0.75 in.	0	0	$0	$0
Lucas	4/3/3014	19:20	Hail	1.50 in.	0	0	$70,000	$0
Allen	4/3/3014	19:35	Hail	1.75 in.	0	0	$175,000	$0
Allen	4/27/2014	8:00	Hail	0.75 in.	0	0	$0	$0
Murphy	4/27/2014	8:15	Hail	1.25 in.	0	0	$1,000	$0
Wylie	4/27/2014	8:17	Hail	1.25 in.	0	0	$1,000	$0
Wylie	4/27/2014	8:19	Hail	1.00 in.	0	0	$0	$0
Frisco	4/24/2015	17:18	Hail	0.88 in.	0	0	$0	$0
Farmersville	5/28/2015	17:21	Hail	1.00 in.	0	0	$0	$0
Farmersville	5/28/2015	17:26	Hail	1.75 in.	0	0	$30,000	$0
Farmersville	5/28/2015	17:30	Hail	1.00 in.	0	0	$0	$0
Farmersville	5/28/2015	17:30	Hail	1.00 in.	0	0	$0	$0
Parker	8/24/2015	15:40	Hail	0.88 in.	0	0	$0	$0
Princeton	3/17/2016	9:30	Hail	1.50 in.	0	0	$8,000	$0
Blue Ridge	3/17/2016	10:45	Hail	0.88 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	3/23/2016	21:15	Hail	1.75 in.	0	0	$150,000,000	$0
Shepton	3/23/2016	21:15	Hail	1.25 in.	0	0	$0	$0
Shepton	3/23/2016	21:20	Hail	1.75 in.	0	0	$150,000,000	$0
Plano	3/23/2016	21:25	Hail	0.75 in.	0	0	$0	$0
Plano	3/23/2016	21:25	Hail	1.75 in.	0	0	$100,000,000	$0
Plano	3/23/2016	21:25	Hail	1.25 in.	0	0	$5,000	$0
Renner	3/23/2016	21:31	Hail	1.25 in.	0	0	$0	$0
Plano	3/23/2016	21:34	Hail	1.25 in.	0	0	$0	$0
Allen	3/23/2016	21:35	Hail	1.00 in.	0	0	$0	$0
Murphy	3/23/2016	21:35	Hail	1.50 in.	0	0	$50,000	$0
Sachse	3/23/2016	21:37	Hail	2.00 in.	0	0	$100,000,000	$0
Parker	3/23/2016	21:37	Hail	1.75 in.	0	0	$100,000,000	$0
Murphy	3/23/2016	21:40	Hail	1.50 in.	0	0	$20,000	$0
Wylie	3/23/2016	21:42	Hail	0.75 in.	0	0	$0	$0
Wylie	3/23/2016	21:45	Hail	1.75 in.	0	0	$50,000,000	$0
Farmersville	4/11/2016	14:51	Hail	0.75 in.	0	0	$0	$0
Frisco	4/11/2016	16:30	Hail	1.50 in.	0	0	$100,000	$0
Frisco	4/11/2016	16:42	Hail	1.00 in.	0	0	$0	$0
Plano	4/11/2016	16:45	Hail	1.75 in.	0	0	$100,000	$0
Frisco	4/11/2016	16:48	Hail	2.00 in.	0	0	$1,000,000	$0
Plano	4/11/2016	16:50	Hail	2.50 in.	0	0	$1,000,000	$0
Allen	4/11/2016	16:50	Hail	2.00 in.	0	0	$500,000	$0
Allen	4/11/2016	16:54	Hail	1.50 in.	0	0	$500,000	$0
McKinney	4/11/2016	16:55	Hail	1.25 in.	0	0	$50,000	$0
Forest Grove	4/11/2016	16:56	Hail	2.00 in.	0	0	$5,000,000	$0
Plano	4/11/2016	17:57	Hail	2.00 in.	0	0	$1,000,000	$0
Lucas	4/11/2016	17:03	Hail	1.75 in.	0	0	$250,000	$0
Parker	4/11/2016	17:03	Hail	2.00 in.	0	0	$250,000	$0
Allen	4/11/2016	17:03	Hail	2.00 in.	0	0	$1,000,000	$0
Wylie	4/11/2016	17:07	Hail	1.50 in.	0	0	$50,000	$0
Plano	4/11/2016	17:07	Hail	1.50 in.	0	0	$100,000	$0
Wylie	4/11/2016	17:12	Hail	2.75 in.	0	0	$5,000,000	$0
Wylie	4/11/2016	17:15	Hail	3.50 in.	0	0	$50,000,000	$0
Wylie	4/11/2016	17:17	Hail	4.25 in.	0	0	$100,000,000	$0
Lavon	4/11/2016	17:18	Hail	2.50 in.	0	0	$250,000	$0
Wylie	4/11/2016	17:19	Hail	5.25 in.	0	0	$60,000,000	$0
Shepton	5/10/2016	19:25	Hail	0.88 in.	0	0	$0	$0
Lolaville	5/10/2016	19:34	Hail	0.88 in.	0	0	$0	$0
Allen	5/29/2016	17:45	Hail	0.75 in.	0	0	$0	$0
Murphy	5/29/2016	18:25	Hail	0.88 in.	0	0	$0	$0
Anna	5/29/2016	18:30	Hail	1.00 in.	0	0	$0	$0
Anna	5/29/2016	18:43	Hail	1.00 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Frisco	2/27/2017	12:37	Hail	0.88 in.	0	0	$0	$0
Frisco	2/27/2017	12:44	Hail	1.00 in.	0	0	$0	$0
McKinney	3/26/2017	1930	Hail	2.00 in.	0	0	$100,000	$0
Frisco	3/26/2017	19:31	Hail	1.75 in.	0	0	$10,000	$0
Frisco	3/26/2017	19:35	Hail	2.00 in.	0	0	$10,000	$0
Frisco	3/26/2017	19:36	Hail	2.00 in.	0	0	$10,000	$0
Fairview	3/26/2017	19:45	Hail	0.88 in.	0	0	$0	$0
Frisco	3/26/2017	19:46	Hail	2.00 in.	0	0	$10,000	$0
Frisco	3/26/2017	19:50	Hail	1.75 in.	0	0	$5,000	$0
Fairview	3/26/2017	19:57	Hail	1.00 in.	0	0	$0	$0
McKinney	3/26/2017	20:00	Hail	2.00 in.	0	0	$5,000	$0
Melissa	3/26/2017	20:07	Hail	1.50 in.	0	0	$0	$0
Murphy	3/29/2017	2:08	Hail	1.00 in.	0	0	$0	$0
Climax	4/4/2017	18:30	Hail	1.00 in.	0	0	$0	$0
Culleoka	4/4/2017	18:32	Hail	1.00 in.	0	0	$0	$0
Princeton	4/4/2017	18:38	Hail	1.00 in.	0	0	$0	$0
Frisco	4/10/2017	13:54	Hail	1.00 in.	0	0	$2,000	$0
Allen	4/10/2017	14:04	Hail	1.00 in.	0	0	$0	$0
McKinney	4/10/2017	21:30	Hail	1.00 in.	0	0	$0	$0
Frisco	4/10/2017	23:22	Hail	1.75 in.	0	0	$10,000	$0
Frisco	4/10/2017	23:24	Hail	2.00 in.	0	0	$	$0
Frisco	4/10/2017	23:40	Hail	1.75 in.	0	0	$0	$0
Prosper	4/10/2017	23:41	Hail	1.00 in.	0	0	$0	$0
Celina	4/21/2017	19:29	Hail	1.50 in.	0	0	$5,000	$0
Celina	4/21/2017	19:35	Hail	2.50 in.	0	0	$120,000	$0
Celina	4/21/2017	19:35	Hail	2.00 in.	0	0	$10,000	$0
Prosper	4/21/2017	19:40	Hail	2.75 in.	0	0	$60,000	$0
Celina	4/21/2017	19:41	Hail	1.75 in.	0	0	$10,000	$0
Prosper	4/21/2017	19:43	Hail	1.75 in.	0	0	$10,000	$0
McKinney	4/21/2017	19:47	Hail	1.75 in.	0	0	$10,000	$0
McKinney	4/21/2017	19:52	Hail	2.75 in.	0	0	$20,000	$0
Fairview	4/21/2017	19:56	Hail	1.25 in.	0	0	$5,000	$0
Allen	4/21/2017	20:00	Hail	1.00 in.	0	0	$5,000	$0
Fairview	4/21/2017	20:03	Hail	2.50 in.	0	0	$200,000	$0
Shepton	4/21/2017	21:54	Hail	1.25 in.	0	0	$2,000	$0
Addison Arpt Da	4/21/2017	22:00	Hail	1.50 in.	0	0	$100,000	$0
Plano	4/21/2017	22:06	Hail	1.75 in.	0	0	$120,000	$0
Allen	1/21/2018	17:36	Hail	0.75 in.	0	0	$0	$0
Prosper	4/6/2018	16:30	Hail	1.75 in.	0	0	$10,000	$0
Prosper	4/6/2018	16:31	Hail	1.00 in.	0	0	$0	$0
Rhea Mills	4/6/2018	16:34	Hail	1.00 in.	0	0	$0	$0
Celina	4/6/2018	16:35	Hail	1.50 in.	0	0	$0	$0
Prosper	4/6/2018	16:35	Hail	2.50 in.	0	0	$25,000	$0
Celina	4/6/2018	16:38	Hail	3.00 in.	0	0	$100,000	$0
Prosper	4/6/2018	16:41	Hail	1.50 in.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Foot	4/6/2018	16:44	Hail	1.75 in.	0	0	$10,000	$0
Foot	4/6/2018	16:44	Hail	1.75 in.	0	0	$10,000	$0
McKinney	4/6/2018	16:52	Hail	1.25 in.	0	0	$0	$0
McKinney	4/6/2018	16:54	Hail	2.00 in.	0	0	$10,000	$0
Allen	4/6/2018	16:55	Hail	1.00 in.	0	0	$0	$0
Allen	4/6/2018	17:00	Hail	1.00 in.	0	0	$0	$0
Lebanon	4/6/2018	17:25	Hail	1.00 in.	0	0	$0	$0
Allen	4/6/2018	17:34	Hail	1.50 in.	0	0	$0	$0
Plano	4/6/2018	17:35	Hail	2.00 in.	0	0	$10,000	$0
Plano	4/6/2018	17:35	Hail	2.00 in.	0	0	$10,000	$0
Plano	4/6/2018	17:48	Hail	2.00 in.	0	0	$10,000	$0
Wylie	4/6/2018	17:49	Hail	2.00 in.	0	0	$10,000	$0
Prosper	4/13/2018	16:30	Hail	1.00 in.	0	0	$	$0
Foot	4/13/2018	16:35	Hail	0.75 in.	0	0	$0	$0
Foot	4/13/2018	16:35	Hail	0.75 in.	0	0	$0	$0
Frisco	4/13/2018	16:37	Hail	1.00 in.	0	0	$0	$0
Frisco	4/13/2018	16:46	Hail	0.88 in.	0	0	$0	$0
McKinney	4/13/2018	16:50	Hail	1.00 in.	0	0	$0	$0
McKinney	4/13/2018	16:51	Hail	1.00 in.	0	0	$0	$0
Blue Ridge	4/13/2018	17:03	Hail	1.00 in.	0	0	$0	$0
McKinney	4/13/2018	17:09	Hail	1.00 in.	0	0	$0	$0
McKinney	4/13/2018	17:14	Hail	1.25 in.	0	0	$0	$0
McKinney	4/13/2018	17:16	Hail	1.75 in.	0	0	$0	$0
Roland	4/13/2018	17:16	Hail	1.00 in.	0	0	$0	$0
McKinney	4/13/2018	17:17	Hail	1.00 in.	0	0	$0	$0
McKinney	6/5/2018	6:54	Hail	1.00 in.	0	0	$0	$0
Plano	6/6/2018	00:18	Hail	1.00 in.	0	0	$0	$0
Biggers	6/6/2018	00:29	Hail	1.50 in.	0	0	$0	$0
Prosper	11/30/2018	21:34	Hail	1.25 in.	0	0	$0	$0
Prosper	3/9/2019	5:14	Hail	1.00 in.	0	0	$0	$0
Allen	3/9/2019	5:34	Hail	1.00 in.	0	0	$0	$0
Prosper	3/24/2019	17:17	Hail	1.75 in.	0	0	$10,000	$0
Fairview	3/24/2019	17:28	Hail	1.75 in.	0	0	$10,000	$0
Frisco	3/24/2019	17:33	Hail	1.75 in.	0	0	$10,000	$0
Frisco	3/24/2019	17:35	Hail	2.75 in.	0	0	$100,000	$0
Fairview	3/24/2019	17:35	Hail	2.00 in.	0	0	$10,000	$0
Allen	3/24/2019	17:40	Hail	2.50 in.	0	0	$50,000	$0
Allen	3/24/2019	17:40	Hail	3.00 in.	0	0	$100,000	$0
Allen	3/24/2019	17:43	Hail	4.50 in.	0	0	$500,000	$0
McKinney	3/24/2019	17:47	Hail	2.00 in.	0	0	$10,000	$0
Allen	3/24/2019	17:48	Hail	2.00 in.	0	0	$10,000	$0
Allen	3/24/2019	17:48	Hail	2.25 in.	0	0	$50,000	$0
Frisco	3/24/2019	17:54	Hail	2.00 in.	0	0	$10,000	$0
Lucas	3/24/2019	17:55	Hail	1.75 in.	0	0	$10,000	$0
Allen	3/24/2019	17:57	Hail	3.00 in.	0	0	$100,000	$0
Allen	3/24/2019	18:00	Hail	2.00 in.	0	0	$10,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Allen	3/24/2019	18:06	Hail	2.50 in.	0	0	$50,000	$0
McKinney	3/24/2019	18:12	Hail	2.50 in.	0	0	$50,000	$0
Renner	3/24/2019	21:36	Hail	1.00 in.	0	0	$0	$0
Plano	3/24/2019	21:39	Hail	1.75 in.	0	0	$10,000	$0
Murphy	3/24/2019	21:47	Hail	1.25 in.	0	0	$0	$0
Wylie	3/24/2019	21:50	Hail	1.00 in.	0	0	$0	$0
Farmersville	5/1/2019	19:55	Hail	0.75 in.	0	0	$0	$0
Shepton	5/18/2019	12:29	Hail	1.00 in.	0	0	$0	$0
Anna	6/19/2019	15:31	Hail	1.25 in.	0	0	$0	$0
Anna	6/19/2019	15:31	Hail	0.75 in.	0	0	$0	$0
Desert	6/19/2019	15:44	Hail	1.00 in.	0	0	$0	$0
Fayburg	6/19/2019	16:02	Hail	2.50 in.	0	0	$10,000	$0
McKinney	6/19/2019	20:04	Hail	0.88 in.	0	0	$0	$0
McKinney	6/19/2019	20:08	Hail	1.25 in.	0	0	$0	$0
McKinney	6/19/2019	20:10	Hail	1.00 in.	0	0	$0	$0
Farmersville	6/19/2019	20:40	Hail	0.88 in.	0	0	$0	$0
Farmersville	6/19/2019	20:48	Hail	1.00 in.	0	0	$0	$0
Melissa	10/20/2019	23:38	Hail	1.00 in.	0	0	$0	$0
Totals:					0	0	$882,172,000	$0

Source: National Centers for Environmental Information

As observed in Table 3.10, Historical Losses Due to Hail Events, calculations of annualized losses were conducted using historical data obtained from the National Centers for Environmental Information. The annualized loss value can be interpreted as the impact expected from hail in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.10*, Collin County can expect a total property loss of $25,204,914.29 each year as a result of hail, with no injuries, deaths, or crop losses expected from this event.

The geographical occurrence of hailstorm events cannot be predicted; therefore, the area of potential impacts corresponds to all of Collin County's territory. Therefore, all improved property, emergency and critical facilities, and critical structures are exposed to this hazard, including 37 fire stations, 14 police stations, 46 hospitals, 212 schools, and 135 historical properties. As described above, roofs and structures are more vulnerable to this hazard. Therefore, it is expected that building improvements would be most affected.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to hail and impacts to assets expected from hail events can be summarized as follows:

- **Population**: According to National Centers for Environmental Information (NCEI), no injuries or fatalities have been recorded for hailstorm events. All the population of Collin County is exposed to this hazard, but there are no personal losses expected from hailstorm events.
- **Improved Property**: Based on historical data, a loss of $25,204,914.29 per year can be expected in property loss due to hailstorm damage though values could be underestimated due to lack of accurate reporting. Because of the unpredictability of the geographical location of hailstorms, all improved property in Collin County is exposed to this hazard. Although some crops are susceptible to hail hazards, available historical data for Collin County indicates that there are no expected crop losses from this event.

- **Emergency Facilities**: Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in Collin County are exposed to this hazard.
- **Critical Facilities**: Because of the unpredictability of the geographical location of hailstorms, all critical facilities in Collin County are exposed to this hazard.
- **Critical Infrastructure**: Because of the unpredictability of the geographical location of hailstorms, all critical infrastructure in Collin County is exposed to this hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii*)(C), which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Wildfires

By definition, wildfires are fires occurring in a wildland area (e.g., grassland, forest, brush land) except for fire under prescription. Therefore, impacts from this hazard are related to wildland areas and what is known as Wildland Urban Interface (WUI), which are defined as the area where structures and other human development meet or intermingle with undeveloped wildland. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. The expansion of these areas has increased the likelihood that wildfires will threaten structures and people.

Wildfires can cause significant damage to property and threatens the lives of people who are unable to evacuate WUI areas. All five categories of assets located in these wildfire-prone areas are considered vulnerable and can be exposed to this hazard.

WUI data was obtained from the Texas Forest Service wildfire database. The data provides GIS data for wildfires and households affected. Data from the National Centers for Environmental Information provided the property and crop damage totals for Collin County wildfires. According to the NCEI, there were no specific recorded instances of wildfire during the period studied for Anna, Celina, Fairview, Farmersville, Josephine, Lavon, Lowry Crossing, Lucas, Melissa, Murphy, New Hope, Parker, Prosper, St. Paul, and Wylie.

Table 3.11 provides the magnitude, number of fatalities, property and crop damage caused by fires in the county.

Table 3.11 Historical Losses due to Wildfires (1/1/1996-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Princeton	2/15/1996	10:00	Wildfire		0	0	$0	$0
Collin (Zone)	6/25/2006	11:00	Wildfire		0	0	$17,000	$2,400
Collin (Zone)	9/5/2011	13:00	Wildfire		0	0	$50,000	$0
Collin (Zone)	5/23/2012	10:10	Wildfire		1	0	$0	$0
Totals:					1	0	$67,000	$2,400

Source: National Centers for Environmental Information

In order to assess wildfire risk and vulnerability of the identified assets, a Geographic Information System-based analysis was conducted to estimate exposure to this event using GIS data in combination with Collin Central Appraisal District property records, and the Regional Hazard Assessment Tool.

Wildland fires in Collin County are highly likely to occur in the next year and will impact the county as a whole. Based on previous occurrences, the extent of wildland fires will be very high. Fires will start easily and spread at a rapid rate, which can result in extensive county wide property damage. According to the Texas Forest Service Wildfire Summary Report, 52% of Collin County's population is located in the Wildland Urban Interface.

Table 3.12 Distribution of WUI Interface Communities in Collin County

Jurisdiction	Area (Sq. Mile)	WUI-Interface Community				
		Low Density (Sq. Mile)	Medium Density (Sq. Mile)	High Density (Sq. Mile)	Total (Sq. Mile)	Percentage of Total Area (%)
Unincorporated	451.14	150.16	94.71	7.39	252.26	55.92%
Allen	26.41	0.75	2.41	6.01	9.17	34.72%
Anna	16.05	2.98	2.52	0.89	6.39	39.81%
Blue Ridge	1.67	0.42	0.55	0.52	1.49	89.22%
Celina	33.71	9.02	3.89	1.17	14.08	41.77%
Fairview	8.86	0.91	4.04	2.53	7.48	84.42%
Farmersville	4.26	0.61	1.00	1.22	2.83	66.43%
Frisco	43.36	3.75	3.85	6.6	14.2	32.75%
Josephine	1.77	0.02	0.68	0.21	0.91	51.41%
Lavon	3.05	0.43	0.85	0.32	1.6	52.46%
Lowry Crossing	2.57	0.09	1.41	0.90	2.4	93.39%
Lucas	15.93	1.59	9.75	0.65	11.99	75.27%
Melissa	11.85	2.76	3.05	1.33	7.14	60.25%
Murphy	5.68	0.16	0.92	1.62	2.7	47.54%
New Hope	1.40	0.09	0.84	0.35	1.28	91.43%
Parker	8.49	0.75	3.60	1.14	5.49	64.66%
Princeton	10.61	1.24	1.81	1.57	4.62	43.54%
Prosper	18.25	2.16	3.61	1.20	6.97	38.19%
St. Paul	1.40	0.01	0.80	0.35	1.16	82.86%
Wylie	36.20	2.36	5.19	6.23	13.78	38.07%

Source: Texas Forest Service

The determination of property vulnerability to wildfires was calculated by overlaying the County's parcel data and the Texas Fire Service data. The determination of assessed value at-risk (exposure) to wildfires was calculated by overlaying the improved property shapefile to the WUI polygons, and adding the total assessed building values within each of the low/medium/high density WUI Interface communities (*Table 3.12*).

Table 3.13 Parcels and Assessed Value of Improvements

Jurisdiction	Residential Parcels	Commercial Parcels	Total Assessed Value of Improvements (Buildings & Contents) at Risk	Percentage (%) of Assessed Value of Improvements (Buildings & Contents) at Risk
Collin County	104,743	7,983	$41,609,034,512	32.19%

Source: Texas Forest Service

As observed in *Table 3.13* approximately 32.19% of Collin County's improved property is vulnerable to wildfires. Based on geographical location, a total of $41,609,034,512 worth of property value composed of buildings and its contents are vulnerable to this hazard.

In compliance to *Requirement 201.6(c)(2)(ii)* Collin County's vulnerability to wildfire and impacts to assets expected from this event can be summarized as follows:

- **Population**: According to National Centers for Environmental Information (NCEI), no injuries or fatalities have been recorded for hailstorm events, Based on geographical data, approximately 104,743 residential parcels in Collin County are vulnerable to wildfires.
- **Improved Property**: Based on historical data, a loss of $2,791.67 per year can be expected in property loss and $100 per year in crop losses due to hailstorm damage though values could be underestimated due to lack of accurate reporting. Based on geographical data, a loss of $41,609,034,512 worth of buildings and its contents is exposed to wildfires. This corresponds to a 32.19% overall property improvement values across Collin County.
- **Emergency Facilities**: Based on geographic information and assuming that the facilities located within the WUI, there are emergency facilities exposed to the wildfire hazard.
- **Critical Facilities**: Based on geographic information and assuming that the facilities located within the WUI, there are critical facilities exposed to the wildfire hazard.
- **Critical Infrastructure**: Based on geographic information and assuming that the infrastructure located within the WUI, there are critical infrastructure exposed to the wildfire hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C),* which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

3.5 Statistical Risk Assessment

A statistical risk assessment uses statistical and mathematical tools to predict hazard frequency and hazard estimated impacts. Data collected from National Centers for Environmental Information storm events database (recorded historic hazard events), census block data from the U.S. Census 2010 block data provided by the Texas Forest Service and Regional Hazard Assessment Tool were used to assess vulnerability of the five vulnerable categories of assets: population, improved property, critical facilities, critical infrastructure, and emergency facilities.

The statistical analysis was conducted using the historical data obtained from National Centers for Environmental Information. The data included both casualty and property losses from hazard events that occurred in Collin County from 1/1/1950 or 1/1/1996 to 9/22/2020. Annualized personal and property losses were calculated by dividing the total losses by the number of years for which data was available (i.e. 24 or 70 years).

Extreme Heat

Extreme heat impacts large areas and cross jurisdictional boundaries; therefore, all Collin County and all of the jurisdictions participating on this plan are exposed to this hazard. Improved property, emergency facilities, critical infrastructure, and critical facilities are not considered vulnerable to extreme heat or cold events; therefore, estimated vulnerability to these assets is anticipated to be minimal. However, population is significantly vulnerable to extreme heat.

Based on the available information, vulnerability to extreme heat was assessed using two techniques: 1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental information was used to predict expected monetary and human losses from the event; 2) in fulfillment of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for extreme heat and the nature of the impacts expected from this hazard event were used to identify the vulnerable assets.

Table 3.14 presents Collin County's recorded historical losses due to extreme heat events as provided in the hazard events database obtained from the National Centers for Environmental Information. The annualized losses due to extreme events were calculated using the methodology described in section 3.3

Table 3.14 Extreme Heat Historical Occurrences Between (1/1/1996-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	7/19/1997	18:00	Heat		0	0	$0	$0
Collin (Zone)	7/1/1998	0:00	Heat		0	0	$0	$0
Collin (Zone)	8/1/1999	0:00	Heat		0	0	$0	$0
Collin (Zone)	7/1/2000	0:00	Heat		0	0	$0	$0
Collin (Zone)	8/1/2000	0:00	Heat		0	0	$0	$0
Collin (Zone)	9/1/2000	0:00	Heat		0	0	$0	$0
Collin (Zone)	8/1/2011	6:00	Excessive Heat		1	0	$0	$0
Collin (Zone)	8/6/2011	2:21	Heat		1	0	$0	$0
Collin (Zone)	7/19/2015	16:00	Excessive Heat		1	0	$0	$0
Collin (Zone)	6/14/2016	10:30	Heat		0	0	$0	$0
Collin (Zone)	7/19/2016	16:00	Heat		1	0	$0	$0
Collin (Zone)	6/20/2019	15:00	Excessive Heat		0	0	$0	$0
Collin (Zone)	7/8/2019	12:00	Heat		0	0	$0	$0
Collin (Zone)	7/16/2019	12:00	Heat		0	0	$0	$0
Collin (Zone)	8/7/2019	11:00	Heat		0	0	$0	$0
Collin (Zone)	8/17/2019	11:00	Heat		0	0	$0	$0
Collin (Zone)	8/26/2019	13:00	Heat		0	0	$0	$0
Totals:					4	0	$0	$0

Source: National Centers for Environmental Information

The annualized loss value can be interpreted as the impact expected from extreme heat in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.14*, Collin County can expect 0.17 fatalities and no injuries per year, and no property or crop losses expected from extreme heat.

The occurrence of extreme heat is regional; therefore the area of potential impacts corresponds to all Collin County's territory. However, according to the recorded historical information, extreme heat does not have a significant impact on property value.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to extreme heat and impacts to assets expected from these events can be summarized as follows:

- **Population**: Based on historical data, extreme heat can be expected to produce an average of 0.17 fatalities and no injuries per year. All the population of Collin County is exposed to this hazard.
- **Improved Property**: Based on historical data and the negligible impact of extreme heat to developed areas, the improved property in Collin County is not exposed to this hazard.
- **Emergency Facilities**: Based on historical data and the negligible impact of extreme heat to buildings, the existing and future emergency facilities in Collin County are not exposed to this hazard.
- **Critical Facilities**: Based on historical data and the negligible impact of extreme heat to buildings, the existing and future critical facilities in Collin County are not exposed to this hazard.
- **Critical Infrastructure**: Based on historical data and the negligible impact of extreme heat to existing and future critical infrastructure, exposure to this hazard is considered minimal in Collin County.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C)*, which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

High Wind

High wind events impact large areas and cross jurisdictional boundaries; therefore, all of Collin County is exposed to this hazard. Improved property, emergency facilities, critical infrastructure, and critical facilities, and population are considered vulnerable to this hazard.

Based on the available information, vulnerability to high winds was assessed using two techniques: (1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental Information was used to predict expected monetary and human losses from the event; (2) in fulfillment of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for high winds and the nature of the impacts expected from this hazard event were used to identify the vulnerable assets.

Table 3.15 presents Collin County's recorded historical losses due to high wind events as provided in the hazard events database obtained from the National Centers for Environmental Information. According to the NCEI, there were no recorded high winds events for New Hope, Princeton, and St. Paul.

Table 3.15 High Wind Historical Occurrences Between (1/1/1950-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	11/17/1958	9:50	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/5/1959	21:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/31/1959	23:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/8/1961	3:27	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/27/1963	19:40	Thunderstorm Wind	62 Kts.	0	0	$0	$0
Collin Co.	3/3/1970	4:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/25/1970	5:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/25/1970	5:35	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/23/1971	16:55	Thunderstorm Wind	0 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	4/15/1972	5:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	9/29/1972	18:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/6/1975	17:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/27/1977	7:35	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/23/1978	19:15	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/23/1978	19:25	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/2/1978	22:15	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/28/1978	15:48	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/28/1978	17:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	7/10/1979	2:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	8/22/1979	1:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/24/1980	21:10	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/20/1980	3:15	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	10/17/1980	5:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/17/1981	20:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co..	4/3/1981	18:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	4/28/1981	19:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/23/1981	20:45	Thunderstorm Wind	56 Kts.	0	0	$0	$0
Collin Co..	8/26/1981	15:42	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/17/1982	1:25	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co..	5/31/1982	4:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/22/1983	22:00	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co..	7/5/1983	3:55	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	8/12/1983	0:10	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co..	3/18/1984	18:20	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	3/27/1984	0:20	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/27/1984	21:40	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	8/30/1984	15:00	Thunderstorm Wind	0 Kts.	0	1	$0	$0
Collin Co..	12/13/1984	10:45	Thunderstorm Wind	0 Kts.	0	5	$0	$0
Collin Co..	2/23/1985	2:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	3/26/1985	22:45	Thunderstorm Wind	61 Kts.	0	0	$0	$0
Collin Co.	7/22/1985	15:35	Thunderstorm Wind	56 Kts.	0	0	$0	$0
Collin Co.	3/11/1986	18:58	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	3/11/1986	19:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/19/1986	13:15	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/19/1986	13:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	4/19/1986	13:49	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/9/1986	20:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	7/21/1986	13:45	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co.	9/28/1986	17:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	9/28/1986	17:30	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co.	2/14/1987	21:35	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co.	5/3/1987	19:47	Thunderstorm Wind	51 Kts.	0	0	$0	$0
Collin Co.	5/14/1987	16:29	Thunderstorm Wind	55 Kts.	0	0	$0	$0
Collin Co.	5/28/1987	17:52	Thunderstorm Wind	61 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	5/28/1987	18:10	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/19/1987	19:08	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/23/1987	19:00	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	7/2/1987	10:00	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	8/23/1988	19:30	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	9/17/1988	16:40	Thunder storm Wind	0 Kts.	0	2	$0	$0
Collin Co.	11/12/1988	6:10	Thunder storm Wind	52 Kts.	0	0	$0	$0
Collin Co.	11/15/1988	15:45	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/2/1989	20:10	Thunder storm Wind	56 Kts.	0	0	$0	$0
Collin Co.	6/4/1989	0:35	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/4/1989	2:00	Thunder storm Wind	52 Kts.	0	0	$0	$0
Collin Co.	6/4/1989	2:30	Thunder storm Wind	52 Kts.	0	0	$0	$0
Collin Co.	6/12/1989	5:00	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	6/13/1989	4:30	Thunder storm Wind	0 Kts.	0	0	$0	$0
Collin Co.	7/2/1989	18:50	Thunder storm Wind	61 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co..	8/6/1989	14:25	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	1/17/1990	7:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	1/17/1990	7:30	Thunderstorm Wind	60 Kts.	0	0	$0	$0
Collin Co..	1/19/1990	7:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	3/14/1990	9:45	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	4/15/1990	20:45	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/2/1990	22:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	5/11/1990	21:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	8/21/1990	17:30	Thunderstorm Wind	62 Kts.	0	0	$0	$0
Collin Co..	10/17/1990	16:20	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	4/11/1991	22:30	Thunderstorm Wind	0 Kts.	0	4	$0	$0
Collin Co..	4/17/1991	17:11	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	4/28/1991	13:10	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co..	4/28/1991	13:25	Thunderstorm Wind	50 Kts.	0	0	$0	$0
Collin Co..	5/4/1991	16:20	Thunderstorm Wind	0 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co..	6/5/1991	14:15	Thunderstorm Wind	61 Kts.	0	0	$0	$0
Collin Co..	7/15/1991	16:55	Thunderstorm Wind	65 Kts.	0	0	$0	$0
Collin Co..	9/24/1991	12:00	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Collin Co..	5/11/1992	20:05	Thunderstorm Wind	51 Kts.	0	0	$0	$0
Collin Co..	5/11/1992	20:55	Thunderstorm Wind	51 Kts.	0	0	$0	$0
Collin Co..	6/6/1992	2:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	6/8/1992	15:35	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	6/28/1992	5:12	Thunderstorm Wind	65 Kts.	0	0	$0	$0
Collin Co..	7/28/1992	16:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	8/2/1992	17:30	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	9/2/1992	22:21	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	9/2/1992	22:40	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	9/2/1992	22:45	Thunderstorm Wind	61 Kts.	0	0	$0	$0
Collin Co..	9/2/1992	23:05	Thunderstorm Wind	0 Kts.	0	0	$0	$0
Collin Co..	9/2/1992	23:50	Thunderstorm Wind	0 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	11/1/1992	1:00	Thunderstorm Wind	0 Kts.	0	0	$0	$0
McKinney	10/19/1993	4:00	Thunderstorm Wind	70 Kts.	0	0	$50,000	$0
Frisco	4/2/1994	20:15	Thunderstorm Wind	0 Kts.	0	0	$5,000	$0
Allen	4/26/1994	23:05	Thunderstorm Wind	4 Kts.	0	0	$0	$0
Allen	5/13/1994	4:40	Thunderstorm Wind	0 Kts.	0	0	$50,000	$0
Melissa	5/29/1994	9:15	Thunderstorm Wind	0 Kts.	0	0	$50,000	$0
Wylie	5/29/1994	9:45	Thunderstorm Wind	57 Kts.	0	0	$0	$0
Farmersville	6/19/1994	15:00	Thunderstorm Wind	0 Kts.	0	0	$5,000	$0
Frisco	7/12/1994	19:39	Thunderstorm Wind	0 Kts.	0	0	$5,000	$0
Wylie	7/12/1994	20:10	Thunderstorm Wind	0 Kts.	0	0	$5,000	$0
Anna	8/7/1994	12:10	Thunderstorm Wind	0 Kts.	0	0	$500	$0
McKinney	8/7/1994	12:30	Thunderstorm Wind	0 Kts.	0	0	$500	$0
Royse City	11/4/1994	22:50	Thunderstorm Wind	0 Kts.	0	0	$5,000	$0
Celina	4/17/1995	21:05	Thunderstorm Wind	0 Kts.	0	0	$30,000	$0
Frisco	4/17/1995	21:05	Thunderstorm Wind	0 Kts.	0	0	$40,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	4/17/1995	21:30	Thunder storm Wind	0 Kts.	0	0	$2,000	$0
Parker	5/7/1995	22:10	Thunder storm Wind	0 Kts.	0	0	$0	$0
Culleoka	5/7/1995	22:39	Thunder storm Wind	0 Kts.	0	0	$15,000	$0
Farmersville	5/7/1995	22:50	Thunder storm Wind	0 Kts.	0	0	$200,000	$0
Melissa	5/24/1995	17:00	Thunder storm Wind	0 Kts.	0	0	$100,000	$0
McKinney	5/24/1995	17:10	Thunder storm Wind	0 Kts.	0	0	$0	$0
Countywide	5/24/1995	17:30	Thunder storm Wind	0 Kts.	0	0	$0	$0
Arthur City	5/24/1995	18:45	Thunder storm Wind	0 Kts.	0	0	$0	$0
Celina	7/4/1995	23:15	Thunder storm Wind	0 Kts.	0	0	$2,000	$0
Plano	7/5/1995	2:45	Thunder storm Wind	0 Kts.	0	0	$2,000	$0
Melissa	8/20/1995	17:45	Thunder storm Wind	0 Kts.	0	0	$75,000	$0
McKinney	8/20/1995	18:00	Thunder storm Wind	0 Kts.	0	0	$100,000	$0
Lucas	5/27/1996	4:15	Thunder storm Wind	68 Kts.	0	0	$1,000	$0
Prosper	6/6/1996	21:20	Thunder storm Wind	52 Kts.	0	0	$0	$0
Plano	3/29/1997	21:52	Thunder storm Wind	52 Kts.	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Allen	3/29/1997	22:16	Thunderstorm Wind	52 Kts.	0	0	$20,000	$0
Plano	5/19/1997	17:58	Thunderstorm Wind	57 Kts.	0	0	$0	$0
Plano	6/16/1997	19:10	Thunderstorm Wind	58 Kts.	0	0	$0	$0
McKinney	5/8/1998	20:25	Thunderstorm Wind	53 Kts.	0	0	$0	$0
Frisco	5/8/1998	20:35	Thunderstorm Wind	61 Kts.	0	0	$100,000	$0
McKinney	5/8/1998	20:50	Thunderstorm Wind	61 Kts.	0	0	$100,000	$0
McKinney	5/8/1998	20:57	Thunderstorm Wind	52 Kts.	0	0	$0	$0
Plano	11/9/1998	23:10	Thunderstorm Wind	50 Kts.	0	0	$0	$0
Wylie	2/25/2000	22:35	Thunderstorm Wind	61 Kts. E	0	0	$0	$0
Lavon	2/25/2000	23:17	Thunderstorm Wind	52 Kts. E	0	0	$0	$0
Plano	2/25/2000	23:40	Thunderstorm Wind	61 Kts. E	0	0	$0	$0
Frisco	5/27/2000	16:20	Thunderstorm Wind	57 Kts. M	0	0	$0	$0
Wylie	5/27/2000	16:50	Thunderstorm Wind	61 Kts. E	0	0	$0	$0
McKinney	5/28/2001	0:08	Thunderstorm Wind	57 Kts. E	0	0	$0	$0
Countywide	6/14/2001	18:45	Thunderstorm Wind	58 Kts. E	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
McKinney	6/14/2001	19:00	Thunderstorm Wind	61 Kts. E	0	0	$0	$0
Melissa	9/18/2001	18:05	Thunderstorm Wind	73 Kts. E	0	0	$0	$0
Celina	10/10/2001	22:51	Thunderstorm Wind	52 Kts. E	0	0	$0	$0
McKinney	10/12/2001	20:20	Thunderstorm Wind	52 Kts. E	0	0	$0	$0
Celina	8/25/2002	14:26	Thunderstorm Wind	52 Kts. E	0	0	$10,000	$0
McKinney	8/27/2002	5:50	Thunderstorm Wind	52 Kts. E	0	0	$5,000	$0
Farmersville	5/24/2003	21:20	Thunderstorm Wind	52 Kts. ES	0	0	$20,000	$0
McKinney	5/24/2003	22:47	Thunderstorm Wind	52 Kts. ES	0	0	$0	$0
Frisco	6/11/2003	21:55	Thunderstorm Wind	52 Kts. ES	0	0	$5,000	$0
Plano	8/22/2003	16:10	Thunderstorm Wind	61 Kts. ES	0	0	$0	$0
Plano	8/22/2003	16:30	Thunderstorm Wind	61 Kts. ES	0	0	$2,000	$0
McKinney	8/26/2003	14:38	Thunderstorm Wind	52 Kts. ES	1	4	$15,000	$0
Frisco	8/26/2003	14:58	Thunderstorm Wind	61 Kts. ES	0	0	$5,000	$0
Nevada	3/4/2004	15:20	Thunderstorm Wind	60 Kts. ES	0	0	$75,000	$0
Farmersville	3/4/2004	15:41	Thunderstorm Wind	61 Kts. ES	0	0	$250,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
McKinney	6/2/2004	18:32	Thunder storm Wind	50 Kts. ES	0	0	$2,000	$0
McKinney	4/5/2005	16:50	Thunder storm Wind	58 Kts. MS	0	0	$0	$0
Allen	5/25/2005	12:38	Thunder storm Wind	50 Kts. ES	0	0	$0	$0
Princeton	7/15/2005	15:53	Thunder storm Wind	55 Kts. MS	0	0	$0	$0
Wylie	8/4/2005	16:37	Thunder storm Wind	52 Kts. ES	0	0	$1,000	$0
Princeton	9/28/2005	18:35	Thunder storm Wind	50 Kts. ES	0	0	$15,000	$0
Frisco	3/13/2006	1:11	Thunder storm Wind	61 Kts. ES	0	0	$0	$0
Collin (Zone)	4/7/2006	16:35	Strong Wind	45 Kts. ES	0	0	$20,000	$0
Collin (Zone)	6/16/2006	15:20	Strong Wind	48 Kts. ES	0	0	$2,000	$0
McKinney	8/12/2006	16:10	Thunder storm Wind	50 Kts. ES	0	0	$0	$0
Plano	8/22/2006	16:45	Thunder storm Wind	40 Kts. MS	0	0	$15,000	$0
McKinney	8/22/2006	17:10	Thunder storm Wind	50 Kts. ES	0	0	$0	$0
McKinney	8/23/2006	17:00	Thunder storm Wind	50 Kts. ES	0	0	$0	$0
Plano	8/27/2006	15:30	Thunder storm Wind	50 Kts. ES	0	0	$5,000	$0
Frisco	9/17/2006	4:30	Thunder storm Wind	50 Kts. ES	0	0	$5,000	$0
Collin (Zone)	10/31/2006	10:00	Strong Wind	32 Kts. EG	0	0	$2,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	11/15/2006	6:00	Strong Wind	40 Kts. MG	0	0	$20,000	$0
Collin (Zone)	2/24/2007	12:00	High Wind	50 Kts. EG	0	0	$200,000	$0
Murphy	3/30/2007	20:10	Thunder storm Wind	52 Kts. EG	0	0	$25,000	$0
Plano	4/3/2007	18:10	Thunder storm Wind	52 Kts. EG	0	0	$0	$0
Allen	4/13/2007	18:15	Thunder storm Wind	50 Kts. EG	0	0	$0	$0
Allen	4/24/2007	14:23	Thunder storm Wind	50 Kts. EG	0	0	$5,000	$0
McKinney	4/24/2007	19:35	Thunder storm Wind	50 Kts. EG	0	0	$40,000	$0
Blue Ridge	4/24/2007	20:55	Thunder storm Wind	55 Kts. MG	0	0	$0	$0
Plano	5/2/2007	18:20	Thunder storm Wind	52 Kts. EG	0	0	$0	$0
Plano	5/2/2007	18:30	Thunder storm Wind	65 Kts. EG	0	0	$0	$0
Plano	5/2/2007	18:31	Thunder storm Wind	59 Kts. MG	0	0	$5,000	$0
Allen	5/2/2007	18:34	Thunder storm Wind	50 Kts. EG	0	0	$0	$0
McKinney	5/2/2007	18:55	Thunder storm Wind	50 Kts. EG	0	0	$40,000	$0
Frisco	5/2/2007	19:00	Thunder storm Wind	50 Kts. EG	0	0	$0	$0
McKinney	5/2/2007	19:03	Thunder storm Wind	62 Kts. MG	0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	5/30/2007	8:47	Thunderstorm Wind	50 Kts. EG	0	0	$15,000	$0
Plano	8/29/2007	14:54	Thunderstorm Wind	50 Kts. EG	0	0	$0	$0
Collin (Zone)	1/29/2008	10:50	High Wind	51 Kts. MG	0	0	$0	$0
Collin (Zone)	1/29/2008	7:00	Strong Wind	30 Kts. MS	0	0	$65,000	$0
McKinney	4/10/2008	3:03	Thunderstorm Wind	56 Kts. MG	0	0	$0	$0
McKinney	4/10/2008	3:17	Thunderstorm Wind	76 Kts. MG	0	0	$0	$0
Celina	6/17/2008	10:20	Thunderstorm Wind	50 Kts. EG	0	0	$1,000	$0
Plano	6/17/2008	10:38	Thunderstorm Wind	52 Kts. EG	0	0	$0	$0
McKinney	6/17/2008	10:38	Thunderstorm Wind	55 Kts. MG	0	0	$0	$0
Plano	6/17/2008	10:45	Thunderstorm Wind	50 Kts. EG	0	0	$0	$0
Celina	6/28/2008	17:07	Thunderstorm Wind	50 Kts. EG	0	0	$1,000	$0
Prosper	2/9/2009	4:05	Thunderstorm Wind	58 Kts. EG	0	0	$15,000	$0
Wylie	2/10/2009	22:00	Thunderstorm Wind	65 Kts. EG	0	0	$50,000	$0
Frisco	4/30/2009	2:05	Thunderstorm Wind	50 Kts. EG	0	0	$0	$0
Frisco	5/2/2009	20:50	Thunderstorm Wind	55 Kts. EG	0	0	$5,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Celina	5/6/2009	5:07	Thunderstorm Wind	50 Kts. EG	0	0	$2,000	$0
Wylie	5/6/2009	5:23	Thunderstorm Wind	52 Kts. EG	0	0	$3,000	$0
Frisco	6/10/2009	18:14	Thunderstorm Wind	63 Kts. MG	0	0	$4,000	$0
Frisco	6/10/2009	18:15	Thunderstorm Wind	65 Kts. EG	0	0	$10,000	$0
Frisco	6/10/2009	18:15	Thunderstorm Wind	65 Kts. EG	0	0	$6,000	$0
Plano	6/10/2009	18:19	Thunderstorm Wind	68 Kts. MG	0	0	$5,000	$0
Plano	6/10/2009	18:20	Thunderstorm Wind	65 Kts. EG	0	0	$3,000	$0
Allen	6/10/2009	18:30	Thunderstorm Wind	61 Kts. EG	0	0	$5,000	$0
Foot	6/10/2009	18:30	Thunderstorm Wind	61 Kts. EG	0	0	$5,000	$0
McKinney	6/10/2009	18:35	Thunderstorm Wind	65 Kts. EG	0	0	$5,000	$0
Celina	6/10/2009	18:35	Thunderstorm Wind	61 Kts. EG	0	0	$5,000	$0
Celina	6/10/2009	18:35	Thunderstorm Wind	61 Kts. EG	0	0	$3,000	$0
Anna	6/10/2009	18:50	Thunderstorm Wind	61 Kts. EG	0	0	$12,000	$0
Shepton	7/8/2009	16:10	Thunderstorm Wind	52 Kts. EG	0	0	$6,000	$0
Plano	7/19/2009	13:13	Thunderstorm Wind	50 Kts. EG	0	0	$8,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Melissa	8/5/2009	16:16	Thunderstorm Wind	61 Kts. EG	0	0	$5,000	$0
Shepton	5/14/2010	12:23	Thunderstorm Wind	50 Kts. EG	0	0	$5,000	$0
McKinney	8/17/2010	17:10	Thunderstorm Wind	52 Kts. EG	0	0	$100	$0
Prosper	4/10/2011	23:34	Thunderstorm Wind	70 Kts. EG	0	0	$5,000	$0
Melissa	4/14/2011	22:32	Thunderstorm Wind	56 Kts. EG	0	0	$0	$0
Shepton	4/23/2011	22:37	Thunderstorm Wind	52 Kts. EG	0	0	$2,000	$0
Melissa	4/25/2011	14:58	Thunderstorm Wind	50 Kts. EG	0	0	$0	$0
Celina	5/24/2011	20:48	Thunderstorm Wind	56 Kts. EG	0	0	$5,000	$0
Plano	5/24/2011	21:25	Thunderstorm Wind	61 Kts. EG	0	0	$8,000	$0
Copeville	5/24/2011	21:37	Thunderstorm Wind	54 Kts. MG	0	0	$5,000	$0
Collin Co.	6/21/2011	2:09	Thunderstorm Wind	58 Kts. EG	0	0	$8,000	$0
Farmersville	7/2/2011	17:00	Thunderstorm Wind	56 Kts. EG	0	0	$10,000	$0
Westminster	9/18/2011	18:45	Thunderstorm Wind	52 Kts. EG	0	0	$15,000	$0
Murphy	9/18/2011	19:10	Thunderstorm Wind	61 Kts. EG	0	0	$15,000	$0
Frisco	10/23/2011	0:15	Thunderstorm Wind	52 Kts. EG	0	0	$2,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	10/23/2011	0:21	Thunderstorm Wind	61 Kts. MG	0	0	$0	$0
Celina	5/4/2012	20:25	Thunderstorm Wind	52 Kts. EG	0	0	$20,000	$0
Prosper	5/4/2012	20:35	Thunderstorm Wind	52 Kts. EG	0	0	$5,000	$0
Lolaville	5/30/2012	2:25	Thunderstorm Wind	62 Kts. MG	0	0	$15,000	$0
Forest Grove	6/6/2012	15:30	Thunderstorm Wind	43 Kts. EG	0	0	$3,000	$0
Foot	6/6/2012	15:35	Thunderstorm Wind	52 Kts. EG	0	0	$5,000	$0
Princeton	7/20/2012	15:10	Thunderstorm Wind	52 Kts. EG	0	0	$160,000	$0
McKinney	7/20/2012	15:20	Thunderstorm Wind	52 Kts. EG	0	0	$2,000	$0
Prosper	8/6/2012	14:30	Thunderstorm Wind	52 Kts. EG	0	0	$2,000	$0
Rhea Mills	8/6/2012	14:36	Thunderstorm Wind	55 Kts. EG	0	0	$8,000	$0
Copeville	12/19/2012	21:30	Thunderstorm Wind	65 Kts. EG	0	0	$150,000	$0
Collin (Zone)	12/20/2012	0:00	Strong Wind	43 Kts. EG	0	0	$13,000	$0
Shepton	2/10/2013	3:05	Thunderstorm Wind	50 Kts. EG	0	0	$1,000	$0
Fairview	5/21/2013	13:33	Thunderstorm Wind	56 Kts. EG	0	0	$50,000	$0
Biggers	5/21/2013	13:33	Thunderstorm Wind	59 Kts. MG	0	0	$50,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
McKinney	5/21/2013	13:33	Thunder storm Wind	56 Kts. EG	0	0	$50,000	$0
McKinney	5/21/2013	13:33	Thunder storm Wind	56 Kts. EG	0	0	$50,000	$0
Princeton	5/21/2013	13:49	Thunder storm Wind	56 Kts. EG	0	0	$50,000	$0
Farmersville	5/21/2013	14:00	Thunder storm Wind	54 Kts. EG	0	0	$40,000	$0
Allen	6/17/2013	6:45	Thunder storm Wind	35 Kts. EG	0	0	$2,000	$0
Anna	8/23/2013	16:05	Thunder storm Wind	43 Kts. EG	2	0	$10,000	$0
Farmersville	4/3/2014	18:50	Thunder storm Wind	59 kts. MG	0	0	$90,000	$0
McKinney	4/7/2014	18:38	Thunder storm Wind	50 kts. MG	0	0	$8,000	$0
Plano	5/12/2014	14:40	Thunder storm Wind	56 kts. EG	0	0	$17,000	$0
Lolaville	5/12/2014	14:53	Thunder storm Wind	52 kts. EG	0	0	$7,000	$0
Melissa	5/12/2014	15:05	Thunder storm Wind	52 kts. EG	0	0	$7,000	$0
Forest Grove	7/14/2014	14:00	Thunder storm Wind	50 kts. EG	0	0	$0	$0
Farmersville	10/2/2014	16:10	Thunder storm Wind	50 kts. EG	0	0	$10,000	$0
Anna	10/10/2014	22:02	Thunder storm Wind	54 kts. MG	0	0	$0	$0
Princeton	10/10/2014	22:05	Thunder storm Wind	61 kts. EG	0	0	$0	$5,000

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Allen	10/13/2014	1:18	Thunder storm Wind	50 kts. EG	0	0	$1,000	$0
Allen	4/18/2015	19:43	Thunder storm Wind	60 kts. MG	0	0	$10,000	$0
Anna	4/18/2015	19:58	Thunder storm Wind	52 kts. MG	0	0	$5,000	$0
Anna	4/18/2015	20:03	Thunder storm Wind	52 kts. MG	0	0	$5,000	$0
Anna	11/17/2015	4:35	Thunder storm Wind	56 kts. MG	0	0	$0	$0
Fairview	12/26/2015	19:30	Thunder storm Wind	48 kts. EG	0	0	$5,000	$0
Frisco	3/8/2016	9:00	Thunder storm Wind	56 kts. EG	0	0	$5,000	$0
Murphy	3/23/2016	21:37	Thunder storm Wind	60 kts. EG	0	0	$5,000	$0
Frisco	4/11/2016	16:45	Thunder storm Wind	61 kts. EG	0	0	$30,000	$0
Wylie	4/11/2016	17:15	Thunder storm Wind	50 kts. EG	0	0	$2,000	$0
Celina	4/29/2016	15:50	Thunder storm Wind	50 kts. EG	0	0	$5,000	$0
Anna	5/29/2016	18:30	Thunder storm Wind	56 kts. EG	0	0	$5,000	$0
Shepton	7/15/2016	8:22	Thunder storm Wind	52 kts. EG	0	0	$1,000	$0
Allen	1/15/2017	21:30	Thunder storm Wind	56 kts. EG	0	0	$0	$0
Frisco	1/15/2017	21:40	Thunder storm Wind	52 kts. EG	0	0	$2,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Murphy	1/15/2017	22:00	Thunderstorm Wind	56 kts. EG	0	0	$0	$0
Frisco	3/29/2017	1:49	Thunderstorm Wind	60 kts. EG	0	0	$5,000	$0
Frisco	3/29/2017	1:50	Thunderstorm Wind	65 kts. EG	0	0	$0	$0
McKinney	3/29/2017	1:50	Thunderstorm Wind	60 kts. EG	0	0	$5,000	$0
Lolaville	3/29/2017	1:51	Thunderstorm Wind	55 kts. MG	0	0	$0	$0
Allen	3/29/2017	1:55	Thunderstorm Wind	65 kts. EG	0	0	$5,000	$0
Allen	3/29/2017	1:58	Thunderstorm Wind	52 kts. EG	0	0	$0	$0
Lolaville	3/29/2017	2:00	Thunderstorm Wind	55 kts. EG	0	0	$0	$0
Lolaville	3/29/2017	2:04	Thunderstorm Wind	65 kts. EG	0	0	$0	$0
McKinney	7/8/2017	14:10	Thunderstorm Wind	54 kts. MG	0	0	$0	$0
Allen	7/8/2017	14:40	Thunderstorm Wind	60 kts. EG	0	0	$10,000	$0
Princeton	7/23/2017	20:40	Thunderstorm Wind	55 kts. EG	0	0	$0	$0
Blue Ridge	8/12/2017	16:00	Thunderstorm Wind	50 kts. EG	0	0	$1,000	$0
McKinney	5/25/2018	12:20	Thunderstorm Wind	48 kts. EG	0	0	$1,000	$0
McKinney	6/7/2018	18:21	Thunderstorm Wind	43 kts. EG	1	0	$40,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Plano	8/18/2018	19:00	Thunderstorm Wind	50 kts. EG	0	0	$2,000	$0
Weston	8/18/2018	19:05	Thunderstorm Wind	50 kts. EG	0	0	$0	$0
Altoga	8/18/2018	19:17	Thunderstorm Wind	50 kts. EG	0	0	$5,000	$0
Plano Shiloh Arpk Ar	8/18/2018	19:25	Thunderstorm Wind	50 kts. EG	0	0	$5,000	$0
Renner	3/13/2019	4:12	Thunderstorm Wind	67 kts. MG	0	0	$	$0
Renner	3/13/2019	4:21	Thunderstorm Wind	63 kts. MG	0	0	$	$0
McKinney	3/13/2019	4:25	Thunderstorm Wind	50 kts. MG	0	0	$	$0
Allen	5/18/2019	12:14	Thunderstorm Wind	50 kts. EG	0	0	$	$0
Chambersville	5/21/2019	5:40	Thunderstorm Wind	50 kts. EG	0	0	$	$0
McKinney	6/9/2019	12:32	Thunderstorm Wind	52 kts. MG	0	0	$	$0
Lolaville	6/9/2019	12:57	Thunderstorm Wind	50 kts. EG	0	0	$	$0
Foot	6/29/2019	17:30	Thunderstorm Wind	50 kts. EG	0	0	$	$0
Culleoka	10/20/2019	23:39	Thunderstorm Wind	74 kts. EG	0	0	$	$0
Farmersville	10/20/2019	23:46	Thunderstorm Wind	74 kts. EG	0	3	$	$0
Nevada	10/21/2019	00:05	Thunderstorm Wind	50 kts. EG	0	0	$	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Lebanon	10/21/2019	23:15	Thunder storm Wind	48 kts. EG	0	0	$	$0
Lolaville	4/28/2020	22:04	Thunder storm Wind	48 kts. EG	0	0	$	$0
Total:					4	20	$4,293,000	$5,000

Source: National Centers for Environmental Information

The annualized losses due to high wind events were calculated using the methodology described previously. The annualized loss value can be interpreted as the impact expected from high wind in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.15*, Collin County can expect a per year average of $61,328.57 in property losses, 0.06 fatalities, 0.29 injuries, and $71.43 in crop losses from high wind events.

The occurrence of high winds is regional; therefore, the area of potential impacts corresponds to all Collin County's territory. According to the recorded historical information, high winds impact property. Currently, there is no information available that specifically identifies to the type structures that have been historically damaged by high wind events. However, fatalities, injuries, and crop and property damage has occurred. Because of the regional character of this hazard event, all improved property, emergency and critical facilities, and critical structures are exposed to this hazard.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to high wind and impacts to assets expected from this event can be summarized as follows:

- **Population**: Based on historical data, high wind events can be expected to produce an average of .29 injuries and 0.06 fatalities per year. All the population of Collin County is exposed to this hazard.
- **Improved Property**: Based on historical data, an average loss of $61,328.57 per year in property losses and $71.43 in crop losses are expected from this hazard in Collin County.
- **Emergency Facilities**: Because of the expected geographical widespread nature of high winds, all existing and future emergency facilities in Collin County are exposed to this hazard.
- **Critical Facilities**: Because of the expected geographical widespread nature of high winds, all existing and future emergency facilities in Collin County are exposed to this hazard.
- **Critical Infrastructure**: Because of the expected geographical widespread nature of high winds, all existing and future critical infrastructures in Collin County are exposed to this hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C),* which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Lightning

Because the location at which a lightning event cannot be predicted, all existing and future buildings, critical facilities, critical infrastructure, emergency facilities, improved property, and population are considered to be exposed to this hazard.

Based on the available information, vulnerability to lightning was assessed using two techniques: (1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental Information was used to predict expected monetary and human losses from the event; (2) in fulfillment of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for lightning and the nature of the impacts expected from this hazard event were used to identify the vulnerable assets.

Table 3.16 presents Collin County's recorded historical losses due to lightning events as provided in the hazard events database obtained from the National Centers for Environmental Information. According to the NCEI, there were no recorded lightning events for the Fairview, Farmersville, Josephine, Lowry Crossing, Melissa, New Hope, Parker, Princeton, St. Paul, and Wylie.

Table 3.16 Historical Lightning Occurrences between (1/1/1996-9/22/2020)

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
Weston	7/8/1996	16:30	Lightning		0	0	$100,000	$0
Plano	7/23/1996	12:45	Lightning		0	0	$80,000	$0
Plano	5/19/1997	17:45	Lightning		0	0	$50,000	$0
Blue Ridge	1/4/1998	22:00	Lightning		0	0	$20,000	$0
Allen	10/9/1999	6:00	Lightning		0	0	$5,000	$0
Plano	12/12/1999	8:00	Lightning		0	0	$30,000	$0
Plano	3/10/2000	12:30	Lightning		0	0	$25,000	$0
Plano	2/16/2001	0:24	Lightning		0	0	$750,000	$0
Mc Kinney	4/29/2002	15:00	Lightning		0	1	$0	$0
Mc Kinney	8/26/2003	15:30	Lightning		0	0	$300,000	$0
McKinney	4/24/2007	15:30	Lightning		0	0	$20,000	$0
Plano	5/3/2007	18:10	Lightning		0	0	$250,000	$0
Anna	5/30/2007	9:20	Lightning		0	0	$50,000	$0
McKinney	7/31/2007	14:45	Lightning		0	0	$7,300	$0
Lebanon	2/15/2008	1:45	Lightning		0	0	$500,000	$0
McKinney	5/27/2008	10:30	Lightning		0	0	$70,000	$0
Lucas	7/19/2009	13:15	Lightning		0	0	$405,000	$0
Murphy	7/19/2009	13:20	Lightning		0	0	$200,000	$0
Lolaville	8/21/2009	4:21	Lightning		0	0	$750,000	$0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
Murphy	9/11/2009	17:00	Lightning		0	0	$150,000	$0
Murphy	9/11/2009	17:00	Lightning		0	0	$5,000	$0
Celina	9/1/2010	13:30	Lightning		0	0	$25,000	$0
Collin Co.	6/21/2011	23:18	Lightning		0	0	$30,000	$0
Foot	5/30/2012	10:15	Lightning		0	0	$275,000	$0
Lebanon	5/30/2012	10:22	Lightning		0	0	$450,000	$0
Foot	5/30/2012	10:30	Lightning		0	0	$275,000	$0
Foot	5/30/2012	10:59	Lightning		0	0	$250,000	$0
Frisco	10/2/2014	15:00	Lightning		0	0	$100,000	$0
Lavon	6/21/2015	7:00	Lightning		0	0	$50,000	$0
Lolaville	6/26/2015	19:20	Lightning		0	0	$25,000	$0
Foot	4/29/2016	1:11	Lightning		0	0	$200,000	$0
Frisco	5/23/2016	7:25	Lightning		0	0	$300,000	$0
Plano	5/29/2016	18:30	Lightning		0	0	$200,000	$0
Shepton	6/12/2016	16:51	Lightning		0	0	$4,000	$0
Parker	1/2/2017	5:55	Lightning		0	0	$500,000	$0
Lebanon	7/5/2017	20:00	Lightning		0	0	$1,000,000	$0
Allen	8/7/2017	00:50	Lightning		0	0	$100,000	$0
Foot	10/22/2017	00:00	Lightning		0	0	$225,000	$0
Rockhill	8/9/2018	20:08	Lightning		0	0	$400,000	$0
Lebanon	8/18/2018	19:00	Lightning		0	0	$2,000	$0
Foot	12/26/2018	16:15	Lightning		0	0	$100,000	$0
Lolaville	4/23/2019	21:30	Lightning		0	0	$150,000	$0
Foot	4/23/2019	21:45	Lightning		0	0	$500	$0
Frisco	4/23/2019	22:00	Lightning		0	0	$100,000	$0
Frisco	6/9/2019	12:40	Lightning		0	0	$1,000	$0
Frisco	6/16/2019	2:00	Lightning		0	0	$5,000	$0
Lebanon	6/16/2019	15:51	Lightning		0	0	$1,000	$0
Prosper	10/20/2019	23:21	Lightning		0	0	$150,000	$0
Foot	3/18/2020	4:15	Lightning		0	0	$800,000	$0
Frisco	4/28/2020	22:00	Lightning		0	0	$83,000	$0
Lebanon	4/28/2020	22:00	Lightning		0	0	$8,000	$0

Location	Date	Time	Event	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
Lebanon	4/28/2020	22:00	Lightning		0	0	$500,000	$0
Frisco	4/28/2020	22:00	Lightning		0	0	$3,000	$0
Frisco	4/28/2020	22:00	Lightning		0	0	$30,000	$0
Lebanon	5/23/2020	00:11	Lightning		0	0	$200,000	$0
Frisco	6/23/2020	6:45	Lightning		0	0	$250,000	$0
Totals:					0	1	$10,560,000	$0

Source: National Centers for Environmental Information

The annualized losses due to lightning events were calculated using the methodology described in table 3.16. The annualized loss value can be interpreted as the impact expected from lightning in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.16*, Collin County can expect $440,000 in property losses, with no fatalities, 0.04 injuries, and no losses in crop production from lightning events.

The geographical occurrence of lightning events cannot be predicted; therefore the area of potential impacts corresponds to all Collin County's territory. According to the recorded historical information, lightning impact property. Because of the regional character of this hazard event, all improved property, emergency and critical facilities, and critical structures are exposed to this hazard.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to lightning and impacts to assets expected from this event can be summarized as follows:

- **Population**: Based on historical data, lightning events can be expected to cause no fatalities and 0.04 injuries in Collin County per year. All the population of Collin County is exposed to this hazard.
- **Improved Property**: Based on historical data, an average of $440,000 per year in property losses and $0 in crop losses is expected from lightning events in Collin County.
- **Emergency Facilities**: Because of the expected geographical widespread nature of lightning, all existing and future emergency facilities in Collin County are exposed to this hazard.
- **Critical Facilities**: Because of the expected geographical widespread nature of lightning, all existing and future critical facilities in Collin County are exposed to this hazard.
- **Critical Infrastructure**: Because of the expected geographical widespread nature of lightning, all existing and future critical infrastructures in Collin County are exposed to this hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C,* which addresses land uses and development trends was unattainable during the preparation of this Hazard Mitigation Plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Tornado

The areas of impact from tornado events cannot be predicted, and they can affect extensive areas of a county. All existing and future buildings, critical facilities, critical infrastructure, emergency facilities, improved property, and population are considered to be vulnerable to this hazard.

Based on the available information, vulnerability to tornados was assessed using two techniques: 1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental Information, and the Texas Hazard Mitigation Action Plan was used to predict expected monetary and human losses from the event; 2) in fulfillment of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for tornados and the nature of the impacts expected from this hazard event were used to identify the vulnerable assets.

Table 3.17 presents Collin County's recorded historical losses due to tornado events as provided in the hazard events database obtained from the National Centers for Environmental Information.

Table 3.17 Historical Tornado Occurrences between (1/1/1950-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	3/24/1954	21:30	Tornado	F1	0	4	$25,000	$0
Collin Co.	5/25/1954	18:15	Tornado	F0	0	0	$0	$0
Collin Co.	4/2/1957	16:20	Tornado	F3	0	2	$250,000	$0
Collin Co.	4/27/1958	15:30	Tornado	F2	0	0	$250,000	$0
Collin Co.	10/4/1959	6:00	Tornado	F3	0	5	$250,000	$0
Collin Co.	4/22/1963	17:30	Tornado	F2	0	0	$250,000	$0
Collin Co.	4/28/1963	12:30	Tornado	F1	0	0	$2,500	$0
Collin Co.	5/19/1963	15:00	Tornado	F0	0	0	$0	$0
Collin Co.	3/25/1967	21:00	Tornado	F0	0	0	$0	$0
Collin Co.	3/25/1967	21:00	Tornado	F0	0	0	$0	$0
Collin Co.	4/22/1968	7:50	Tornado	F1	0	0	$25,000	$0
Collin Co.	5/13/1968	3:00	Tornado	F2	0	0	$25,000	$0
Collin Co.	4/27/1969	5:10	Tornado	F2	0	45	$250,000	$0
Collin Co.	10/12/1969	7:44	Tornado	F3	0	0	$2,500	$0
Collin Co.	4/18/1970	21:30	Tornado	F1	0	2	$2,500	$0
Collin Co.	9/1/1970	16:15	Tornado	F1	0	0	$0	$0
Collin Co.	7/19/1971	17:15	Tornado	F1	0	0	$25,000	$0
Collin Co.	12/14/1971	18:15	Tornado	F0	0	0	$25,000	$0
Collin Co.	8/10/1972	16:00	Tornado	F0	0	0	$2,500	$0
Collin Co.	11/20/1973	1:10	Tornado	F1	0	3	$25,000	$0
Collin Co.	6/9/1975	18:40	Tornado	F0	0	0	$0	$0
Collin Co.	3/27/1977	4:54	Tornado	F2	0	0	$250,000	$0
Collin Co.	9/7/1977	15:40	Tornado	F1	0	0	$2,500	$0
Collin Co.	9/12/1977	16:20	Tornado	F2	0	0	$25,000	$0
Collin Co.	3/29/1979	14:15	Tornado	F0	0	0	$0	$0
Collin Co.	7/27/1982	13:00	Tornado	F0	0	0	$2,500	$0
Collin Co.	3/27/1984	16:30	Tornado	F1	0	0	$2,500	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin Co.	10/18/1985	9:30	Tornado	F2	0	2	$250,000	$0
Collin Co.	3/17/1987	19:40	Tornado	F0	0	0	$0	$0
Collin Co.	9/13/1993	10:10	Tornado	F0	0	0	$0	$0
Farmersville	7/12/1994	21:15	Tornado	F0	0	0	$50,000	$0
Princeton	10/7/1994	15:00	Tornado	F1	0	2	$500,000	$0
Mc Kinney	3/16/1998	19:05	Tornado	F1	0	0	$200,000	$0
Frisco	9/5/2001	14:05	Tornado	F0	0	0	$0	$0
Celina	9/5/2001	14:30	Tornado	F1	0	0	$30,000	$0
Frisco	7/1/2003	13:50	Tornado	F0	0	0	$0	$0
Lavon Res	3/4/2004	15:35	Tornado	F1	0	2	$150,000	$0
Anna	5/9/2006	21:26	Tornado	F0	0	0	$0	$0
Anna	5/9/2006	21:33	Tornado	F0	0	0	$30,000	$0
Anna	5/9/2006	21:37	Tornado	F3	2	6	$1,000,000	$0
Wylie	3/30/2007	20:20	Tornado	EF0	0	0	$500,000	$0
Allen	4/10/2008	3:04	Tornado	EF1	0	0	$12,000,000	$0
Princeton	4/3/2014	18:27	Tornado	EF0	0	1	$200,000	$0
Copeville	12/26/2015	19:09	Tornado	EF2	2	119	$1,400,000	$0
Farmersville	12/26/2015	19:17	Tornado	EF1	0	0	$1,500,000	$0
Fayburg	12/26/2015	19:33	Tornado	EF1	1	2	$600,000	$0
Weston	4/29/2016	15:53	Tornado	EF0	0	0	$30,000	$0
Allen	10/20/2019	23:22	Tornado	EF0	0	0	$200,000	$0
Totals:					5	195	$20,332,000	$0

Source: Texas Forest Service, National Centers for Environmental Information

The annualized losses due to tornado events were calculated using the methodology described in Table 3.17. The annualized loss value can be interpreted as the impact expected from tornados in terms of annualized human losses and human injuries, and annualized property losses. As observed in Table 3.17, Collin County can expect an average of 0.07 fatalities and 2.79 injuries per year. All the population of Collin County is exposed to this hazard. Also, an expected average of $290,457.14 per year in property losses is expected from tornados, with most of the historical events occurring in the unincorporated areas of Collin County. Finally, there are no expected crop losses as result of tornado events.

As stated previously, the geographical area of impact for tornado events cannot be predicted, the area of potential impacts corresponds to all Collin County's territory, and all improved property, emergency and critical facilities, and critical structures are exposed to this hazard. According to the recorded historical information, expected casualties and property losses from tornado events are significant.

In compliance to Requirement 201.6(c)(2)(ii), vulnerability to tornados and impacts to assets expected from this event can be summarized as follows:

- **Population**: Based on historical data, tornado events can be expected to cause an average of 2.79 injuries and 0.07 fatalities per year in Collin County. All the population of Collin County is exposed to this hazard.

- **Improved Property**: Based on historical data, an average loss of $290,457.14 per year in property losses are expected to result from tornado events in Collin County. No crop losses are expected from this hazard in Collin County.
- **Emergency Facilities**: Because of the impossibility to predict the geographical area of impact for tornados, all existing and future emergency facilities in Collin County are exposed to this hazard.
- **Critical Facilities**: Because of the impossibility to predict the geographical area of impact for tornados, all existing and future critical facilities in Collin County are exposed to this hazard.
- **Critical Infrastructure**: Because of the impossibility to predict the geographical area of impact for tornados, all existing and future critical infrastructures in Collin County are exposed to this hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(C),* which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

Winter Storms

Because winter storm events are large and can affect extensive areas of a county, all existing and future buildings, critical facilities, critical infrastructure, emergency facilities, improved property, and population are considered to be exposed to this hazard.

Based on the available information, vulnerability to winter storms was assessed using two techniques: 1) to comply with *Requirement 201.6(c)(2)(ii)(B*), historical loss data obtained from the National Centers for Environmental Information was used to predict expected monetary and human losses from the event; 2) in fulfillment of *Requirement 201.6(c)(2)(ii)(A*), geographical hazard areas identified for winter storms and the nature of the impacts expected from this hazard event were used to identify the vulnerable assets.

Table 3.18 presents Collin County's recorded historical losses due to winter storm events as provided in the hazard events database obtained from the National Centers for Environmental Information.

Table 3.18 Winter Storm Historical Occurrences between (1/1/1996-9/22/2020)

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	11/24/1996	14:00	Winter Storm		0	0	$0	$0
Collin (Zone)	12/17/1996	12:00	Winter Weather		0	0	$0	$0
Mc Kinney	1/6/1997	12:00	Winter Weather		0	0	$0	$0
Collin (Zone)	1/12/1997	20:00	Winter Weather		0	0	$0	$0
Collin (Zone)	1/14/1997	23:00	Winter Weather		0	0	$0	$0
Collin (Zone)	12/22/1998	0:00	Ice Storm		0	0	$0	$0
Collin (Zone)	1/25/2000	0:00	Winter Storm		1	0	$0	$0
Collin (Zone)	12/12/2000	18:00	Winter Storm		0	0	$0	$0
Collin (Zone)	12/25/2000	0:00	Winter Storm		0	0	$0	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	12/31/2000	0:00	Winter Storm		0	0	$0	$0
Collin (Zone)	1/1/2001	0:00	Heavy Snow		0	0	$0	$0
Collin (Zone)	11/29/2001	6:00	Ice Storm		0	0	$0	$0
Collin (Zone)	2/5/2002	8:00	Winter Storm		0	0	$0	$0
Collin (Zone)	3/2/2002	6:00	Winter Storm		0	0	$0	$0
Collin (Zone)	2/24/2003	11:20	Winter Storm		0	0	$0	$0
Collin (Zone)	2/14/2004	3:00	Heavy Snow		0	0	$0	$0
Collin (Zone)	12/22/2004	0:01	Winter Weather		0	0	$0	$0
Collin (Zone)	12/7/2005	12:00	Winter Storm		0	0	$0	$0
Collin (Zone)	2/18/2006	3:30	Winter Weather		0	0	$0	$0
Collin (Zone)	11/30/2006	1:00	Winter Storm		0	0	$0	$0
Collin (Zone)	1/13/2007	11:00	Ice Storm		0	0	$30,000	$0
Collin (Zone)	1/17/2007	3:00	Winter Weather		0	0	$30,000	$0
Collin (Zone)	2/2/2007	1:00	Winter Weather		0	0	$0	$0
Collin (Zone)	3/3/2008	22:00	Winter Weather		0	0	$0	$0
Collin (Zone)	12/15/2008	18:00	Winter Weather		0	0	$0	$0
Collin (Zone)	12/23/2008	6:00	Winter Weather		0	0	$0	$0
Collin (Zone)	1/27/2009	7:00	Ice Storm		0	0	$60,000	$0
Collin (Zone)	12/24/2009	12:30	Winter Weather		0	0	$100,000	$0
Collin (Zone)	2/11/2010	5:00	Heavy Snow		0	0	$1,000,000	$0
Collin (Zone)	3/20/2010	19:00	Heavy Snow		0	0	$0	$0
Collin (Zone)	1/9/2011	9:00	Heavy Snow		0	0	$150,000	$0
Collin (Zone)	2/1/2011	0:30	Ice Storm		0	0	$150,000	$0
Collin (Zone)	2/3/2011	23:30	Heavy Snow		0	0	$10,000	$0
Collin (Zone)	12/25/2012	13:30	Heavy Snow		0	0	$550,000	$0
Collin (Zone)	12/5/2013	14:30	Winter Storm		0	0	$500,000	$0

Location	Date	Time	Event	Mag	Fatalities	Injuries	Property Damage	Crop Damage
Collin (Zone)	2/22/2015	18:00	Winter Storm		0	0	$10,000	$0
Collin (Zone)	2/27/2015	9:00	Heavy Snow		0	0	$200,000	$0
Collin (Zone)	3/5/2015	00:02	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	00:23	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	00:25	Winter Weather		0	0	$0	$0
Collin (Zone)	3/5/2015	00:50	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:00	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:02	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:15	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:34	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:34	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	1:46	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	2:50	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	3:59	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	8:15	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	9:11	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	9:11	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	10:20	Heavy Snow		0	0	$0	$0
Collin (Zone)	3/5/2015	11:29	Heavy Snow		0	0	$0	$0
Collin (Zone)	12/7/2017	9:00	Winter Weather		0	0	$0	$0
Collin (Zone)	2/11/2018	10:00	Winter Weather		0	0	$0	$0
Totals:					1	0	$2,790,000	$0

Source: National Centers for Environmental Information

The annualized losses due to winter storm events were calculated using the methodology described previously. The annualized loss value can be interpreted as the impact expected from winter storm in terms of annualized human losses and human injuries, and annualized property losses. As observed in *Table 3.18*, Collin County can expect in average an annual $116,250 in property losses, with no injuries, 0.04 fatalities, and no crop losses from winter storm events.

The geographical occurrence of winter storm events is widespread; therefore, the area of potential impacts corresponds to all Collin County's territory. According to the recorded historical information, winter storm events impact property. Because of the regional character of this hazard event, all improved property, emergency and critical facilities, and critical structures are exposed to this hazard.

In compliance to *Requirement 201.6(c)(2)(ii)*, vulnerability to winter storm events and impacts to assets expected from this event can be summarized as follows:

- **Population**: Based on historical data, winter storm events can be expected to cause an average of zero injuries and 0.04 fatalities per year in Collin County. All the population of Collin County is exposed to this hazard.
- **Improved Property**: Based on historical data, an average loss of $116,250 per year in property losses are expected to result from winter storm events in Collin County. No crop losses are expected from this hazard in Collin County.
- **Emergency Facilities**: Because of the expected geographical widespread nature of winter storms, all existing and future emergency facilities in Collin County are exposed to this hazard.
- **Critical Facilities**: Because of the expected geographical widespread nature of winter storms, all existing and future critical facilities in Collin County are exposed to this hazard.
- **Critical Infrastructure**: Because of the expected geographical widespread nature of winter storms, all existing and future critical infrastructures in Collin County are exposed to this hazard.

Information needed to fulfill *Requirement 201.6(c)(2)(ii)(c),* which addresses land uses and development trends was unattainable during the preparation of this hazard mitigation plan. Compliance with this requirement will be an objective in the five-year planning cycle.

3.6 Qualitative Analysis

In compliance to *Requirement 201.6(c)(2)(ii)* a qualitative analysis was made for three of the hazards representing low risk to Collin County: Dam Failure, Earthquake, and Expansive Soil. Because historical and geographical data regarding these events is unattainable for quantitative analysis at the present time, a qualitative analysis is in order. Quantitative analyses for these hazards will be an objective in the five-year planning cycle update, should information become available.

Dam Failure

The probability of occurrence for dam and/or levee events in Collin County is likely. There is no record of a dam failing in Collin County; therefore, there is a lack of information regarding this hazard and quantitative predictions are not available at the present time. A study is needed to gather more inundation information. All five categories, population, improved property, emergency facilities, critical facilities, and critical infrastructure are considered vulnerable to damage caused by dam and/or levee failure. According to the Priority Risk Index analysis presented in section 3.3, any estimated losses associated with this hazard are anticipated to be of moderate to no risk across Collin County. Based on data from the participating jurisdictions a total of 153 dams are located in Collin County (*Table 3.19).*

Table 3.19 Dams located in Collin County and Participating Jurisdictions

Jurisdiction	Number of Dams	Dam Classification		
		High	Significant	Low
Collin County	153	59	9	85
Total	**153**	**59**	**9**	**85**

Source: National Inventory of Dams

The Hazard Mitigation Planning Team provided a list of high hazard dams located in Collin County. (Table 3.19*)*.

Table 3.20 High Hazard Dams

Jurisdiction	Dam Name
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 32A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 1C DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 3A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 8A DAM
Collin County	LAVON LAKE
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 5A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 10 DAM
Collin County	LITTLE ELM AND LATERALS WS SCS SITE 18A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 33 DAM
Collin County	ROWLETT CREEK WS SCS SITE 5 DAM
Collin County	PILOT GROVE CREEK WS SCS SITE 83A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 3C DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 4 DAM

Jurisdiction	Dam Name
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 11 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 9 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 30 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 2B DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 1A DAM
Collin County	WILLOW BEND LAKE NO 1 DAM
Collin County	PILOT GROVE CREEK WS SCS SITE 82 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 8G DAM
Collin County	PILOT GROVE CREEK WS SCS SITE 80 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 16 DAM
Collin County	UPPER EAST FK LATERALS WS SCS SITE 2 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 3B DAM
Collin County	ROWLETT CREEK WS SCS SITE 7 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 12 DAM
Collin County	PILOT GROVE CREEK WS SCS SITE 28 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 3E DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 31 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 14 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 3D DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 17 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 15 DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 2A DAM
Collin County	EAST FORK ABOVE LAVON WS SCS SITE 32 DAM
Collin County	ROWLETT CREEK WS SCS SITE 4 DAM
Collin County	PILOT GROVE CREEK WS SCS SITE 79 DAM
Collin County	STONEBRIDGE LAKE F 3 DAM
Collin County	STONEBRIDGE LAKE F 4 DAM
Collin County	STONEBRIDGE LAKE F 2 DAM
Collin County	STONEBRIDGE LAKE 13 DAM
Collin County	STONEBRIDGE LAKE 11 D DAM
Collin County	STONEBRIDGE LAKE 12 DAM
Collin County	PRESTONWOOD WEST DAM
Collin County	STONEBRIDGE LAKE 11 A DAM
Collin County	STONEBRIDGE LAKE B DAM
Collin County	STONEBRIDGE LAKE F 1 DAM
Collin County	SISTER GROVE CREEK WS SCS SITE 38 DAM
Collin County	LAGO GRANDE DAM
Collin County	SISTER GROVE CREEK WS SCS SITE 3 DAM
Collin County	WILLOW BEND LAKE NO 2 DAM
Collin County	ROACH TRACT LOWER DAM

Jurisdiction	Dam Name
Collin County	ROACH TRACT DAM
Collin County	STONEBRIDGE LAKE A DAM
Collin County	LAKE LACIMA DAM
Collin County	GLENEAGLES DAM D6
Collin County	STONEBRIDGE LAKE C DAM
Collin County	CARTER RANCH DAM

Source: National Inventory of Dams

Earthquake

The probability of occurrence for an earthquake event in Collin County is extremely low. Due to unattainable information regarding this hazard, quantitative predictions are not available at the present time and further study is needed.

All five categories, population, improved property, emergency facilities, critical facilities, and critical infrastructure are considered vulnerable to damage caused by an earthquake. According to the Priority Risk Index analysis presented in section 3.3 any estimated losses associated with this hazard are anticipated to be of little to no risk across Collin County.

Expansive Soils

The probability of occurrence for expansive soil events in Collin County is at a low to moderate risk. Damage from expansive soils is difficult to document. Further studies are needed. There have been no documented previous occurrences of expansive soils in Collin County and the jurisdictions participating on this plan, with the exception of Fairview. The documentation of the occurrence can be found in Annex F.

Population is not considered vulnerable to damage caused by expansive soils; therefore, any estimated population losses associated with this hazard are anticipated to be minimal across Collin County. Improved property, emergency facilities, critical facilities, and critical Infrastructures are more vulnerable to this event. Collin County is located in an area which contains abundant clay with high swelling potential. According to the Priority Risk Index analysis, impacts from expansive soils have a low to moderate risk of creating a hazard that could cause damage to highways, streets, as well as other structures

3.7 Summary

Table 3.21 provides a summary of annualized losses for each of the nine hazard events for which the quantitative analysis (Geographic Information System and/or statistical) was conducted. *Table 3.22* summarizes the qualitative analysis conducted on the remaining three hazard events. Hurricane/Tropical Storm, Land Subsidence, and Coastal Erosion are not listed due to lack of impact.

Table 3.21 Annualized Losses Expected from Hazards Analyzed using a Quantitative Analysis

Hazard Event	Annualized Expected Fatalities	Annualized Expected Injuries	Annualized Expected Property Losses	Annualized Expected Crop Loss	Annualized Expected Crop Loss per Acre
Drought	0	0	$21,208.33	$58,916.67	$0.25
Extreme Heat	0.17	0	$0	$0	$0
Flood	0	0	$15,166.67	$0	$0
Hail	0	0	$25,204,914.29	$0	$0
High Wind	0.06	0.29	$61,328.57	$71.43	$0
Lightning	0	0.06	$440,000	$0	$0
Tornado	0.07	2.79	$290,457.14	$0	$0
Wildfire	0.04	0	$2,791.67	$100	$0.01
Winter Storm	0.04	0	$116,250	$0	$0

Table 3.22 Summary of Qualitative Analysis

Hazard Event	Probability of Occurrence According to the Priority Risk Index	Vulnerable Categories				
		Population	Property Damage	Emergency Facilities	Critical Facilities	Critical Infrastructures
Dam Failure	Moderate to No Risk	√	√	√	√	√
Earthquake	Low to No Risk	√	√	√	√	√
Expansive Soils	Negligible to No Risk		√	√	√	√

Chapter Four: 2016 Plan Action Items

4.1 Unincorporated Collin County Action Items: 2016 Plan

Collin County Action Item	Adopt and promote a comprehensive public education program that provides resources to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	Homeland Security
Implementation Schedule	1-3 years
Effect on Old Buildings	Depending on mitigation actions employed, can reduce the damage from multiple hazards to existing buildings.
Effect on New Buildings	Depending on mitigation actions implements, can reduce damages from multiple hazards to new buildings.
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This program will include discussion about mitigation projects for all identified hazards and what mitigation actions can be taken.
Status	Some work performed in this area using regional resources along with utilizing general fund dollars from Collin County.

Collin County Action Item	Develop and implement building codes to mitigate against structural damages caused by drought, high winds and tornado.
Hazard(s) Addressed	Drought, Tornado, High Winds
Goal/Objective	3-C
Priority	Low
Estimated Cost	$5,000
Potential Funding Sources	Local Funding
Lead Department	Collin County Engineering
Implementation Schedule	1-5 years
Effect on Old Buildings	If retrofitted, could mitigate damages to old buildings.
Effect on New Buildings	This action can reduce the effects of drought, tornadoes, and high winds on new buildings.
Cost Effectiveness	The cost of this project is low compared to the potential benefits of reducing the effects of drought.
Discussion	During times of drought, earth experiences significant changes that often impact structural foundations. Building codes can mitigate these effects through mandatory use of new technologies such as resource-efficient (low-flow) plumbing for drought and water conservation. Roof bracing requirements for new construction will mitigate damages from tornado and high Winds.
Status	Collin County utilizes adopted building codes.

Collin County Action Item	Expand water conservation measures to new developments and populations
Hazard(s) Addressed	Drought
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	May require low-flow retrofits and soil stabilization through landscaping for existing foundations to reduce effects of drought.
Effect on New Buildings	May require low-flow plumbing installations during construction, foundation protection through alternate landscaping to reduce effects of drought.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Work with local water suppliers and building developers to expand water conservation measures in new areas of development, to include reduced taps and drought resistant landscaping.
Status	Deferred, but rely heavily on local water districts to educate and implement needed programs. Additionally, added water systems have been brought online along with new systems being constructed as of 2021.

Collin County Action Item	Implement Community Tornado Safe Room Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Local Funds
Potential Matching Sources	Local Grants, Donations, In-Kind Match, Resident Match
Lead Department	Fire Marshal/Emergency Management
Implementation Schedule	1-5 years
Effect on Old Buildings	Existing building may be retrofitted for community safe room installation.
Effect on New Buildings	New buildings may include construction of safe rooms for the community.
Cost Effectiveness	Community and residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Local Community Tornado Safe Room Program in Identified Vulnerable Areas.

Status	Collin County residents were able to apply, and some received, grant funding through the North Central Texas Council of Government (NCTCOG) Saferoom Rebate Program. This program provided funding for saferooms through December 2020, when it was ended.

Collin County Action Item	Develop and Implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	Texas A&M Forest Service and USDA Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	2-3 years
Effect on Old Buildings	Can prevent serious damages to or loss of existing buildings due to wildfire.
Effect on New Buildings	Can prevent serious damages to or loss of new buildings due to wildfire.
Cost Effectiveness	CWPPs identify where wildfire mitigation efforts would be most effective.
Discussion	Identify wildland urban interface areas that would benefit from mitigation actions. Based on the individual variables of each area, actions such as fuel management, or defensible space development could be implemented.
Status	Deferred – no actions

Collin County Action Item	Implement Firewise mitigation programs in unincorporated Collin County.
Hazard(s) Addressed	Wildfire
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	USDA and Texas A&M Forest Service Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	1-4 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	Cost low compared to potential loss of life and property to wildfire.
Discussion	Firewise communities experience fewer losses to wildfire than communities without the program.
Status	Deferred – no actions

Collin County Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources.
Effect on New Buildings	May entail enhanced construction materials.
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.
Status	Places identified during past event, however, additional resources need to be utilized to make this a viable option for residents

Collin County Action Item	Coordinate and complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones.
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones.
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – most dams are now under the jurisdictions of incorporated cities.

Collin County Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B, 2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes.
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes.
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – no action. Many of the earthquake threats in the region of slowed

Collin County Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – no action

Collin County Action Item	Distribute all-hazards NOAA Weather Radios to vulnerable populations.
Hazard(s) Addressed	3-C, 4-A, 4-B, 4-C

Goal/Objective	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Priority	Medium
Estimated Cost	$50,000 - $75,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	n/a
Effect on New Buildings	n/a
Cost Effectiveness	Cost of lives lost and injuries sustained is very high compared to cost of proactive mitigation.
Discussion	This project would lead to greater capabilities for vulnerable populations to take mitigation actions prior to and in the event of all hazards.
Status	Deferred – no action

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4.2 City of Allen Action Items: 2016 Plan

City of Allen Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other hazards and civil emergencies.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Develop and establish extreme temperature plan including cooling and heating shelters for vulnerable residents.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management, CERT
Implementation Schedule	1-2 years
Effect on Old Buildings	May require retrofit to accommodate new designs, resources needed
Effect on New Buildings	Will make new buildings safer for vulnerable populations
Cost Effectiveness	Cost to implement this program is low compared to the benefits of reduced injury and death related to extreme temperature.

Discussion	Developing an extreme temperature program that identifies both public and private safe locations for vulnerable residents to go during periods of extreme temperatures would reduce levels of injury and death in this segment of the population.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Adopt and promote a comprehensive public education program, including information about mitigation projects.
Hazard(s) Addressed	Extreme Heat, High Wind, Wildfire, Tornado, Drought, Winter Storms, Flooding, Hail, Expansive Soils, Dam Failure, Earthquake
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Emergency Management, CERT
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is an extremely effective low cost method.
Discussion	Adopt and promote a comprehensive public education program based on the hazards identified in this annex, including information on mitigation projects.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Allen Action Item	Expand outdoor warning sirens to cover new populations
Hazard(s) Addressed	Hail, High Wind, Tornado , Dam Failure, Lightning
Goal/Objective	1-B
Priority	Medium
Estimated Cost	$35,000 each
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management

Implementation Schedule	1-2 years
Effect on Old Buildings	May require siren tower construction on existing buildings
Effect on New Buildings	None
Cost Effectiveness	Cost of implementation is low compared to the benefits of reduced injury and death related to tornados.
Discussion	Replacement of old or damaged warning sirens and expanding coverage to new populations is a proactive approach to mitigating the effects of severe weather and prevent loss of life by providing advanced warning to citizens.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP

Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for earthquake damage
Effect on New Buildings	Study would identify existing construction most at risk for earthquake damage
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Cancelled – No longer a viable action item

Allen Action Item	Improve construction standards and techniques through requiring, by ordinance, builders to utilize water saving plumbing and fixtures in new construction.
Hazard(s) Addressed	Drought
Goal/Objective	2-C

Priority	High
Estimated Cost	$2,000-3,000
Potential Funding Sources	Local budget, Builders.
Lead Department	Building Department
Implementation Schedule	1-5 years
Effect on Old Buildings	No effect unless retrofitted
Effect on New Buildings	Reduced water consumption
Cost Effectiveness	Cost is very low compared to water shortages.
Discussion	This project would require low-flow plumbing and fixtures in all new construction, mitigating the effects of drought.
Status	Cancelled – No longer a viable action item

4.3 City of Anna Action Items: 2016 Plan

City of Anna Action Item	Develop and implement a comprehensive public education program, including hazard mitigation activities.
Hazard(s) Addressed	Dam Failure, Drought, High Winds, Tornado, Wildfire, Winter Storm, Expansive Soil, Extreme Heat, Hail, Lightning, Flooding, Earthquake
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions.
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages.
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Anna identified as being vulnerable to. The program would use a combination of distributed literature, social media, and civic presentations to educate residents on natural hazards and promote hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

City of Anna Action Item	Establish centers for vulnerable residents to go for relief during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate space and resources.
Effect on New Buildings	May entail enhanced construction materials.
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling and heating shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.

Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Enhance safety of existing residential structures.
Effect on New Buildings	Enhance safety of new residential structures.
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Anna Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren, number of sirens TBD
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1—2 years
Effect on Old Buildings	May entail adding a siren tower to existing buildings.
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand the City of Anna's siren coverage to new areas of development not currently protect by sirens.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.

Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones.
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones.
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Develop a drought contingency plan.
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind

Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results may entail retrofits for low-flow plumbing.
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundations.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Plan developed and will be continued to be modified updated to meet the City's needs

City of Anna Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results could define required retrofits or additions to reduce vulnerability to earthquakes.
Effect on New Buildings	Results could require updated codes for new construction to reduce vulnerability to earthquakes.
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.

Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Purchase and distribute NOAA Weather Radios to vulnerable residents.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on any mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages.
Effect on New Buildings	Depending on any mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages.
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information.
Status	Deferred – will be included in 2021 Plan

4.4 City of Blue Ridge Action Items: 2016 Plan

City of Blue Ridge Action Item	Develop and implement a comprehensive public education program, including resources to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, High Winds, Winter Storm, Wildfire, Drought, Hail, Flooding, Lightning, Extreme Heat, Expansive Soils, Dam Failure, Earthquake
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Develop and distribute, via social media, information about mitigating the hazards identified and what actions can be taken in this annex
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Blue Ridge Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Winds, Tornado, Hail
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofits
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Blue Ridge Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	None
Effect on New Buildings	None

Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	The City of Blue Ridge will expand its current siren program into newly developed areas of the jurisdiction that are currently outside of siren coverage.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire

Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire and implement mitigation actions to reduce vulnerability.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and implement a drought contingency plan that will implement water mandatory water conservation measures.
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage and mandatory water restrictions for water conservation.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds

Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would help identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000

Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

4.5 City of Celina Action Items: 2016 Plan

City of Celina Action Item	Purchase and utilize mobile back-up generator
Hazard(s) Addressed	Flooding, Tornado, Earthquake, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds
Goal/Objective	2-D
Priority	High
Estimated Cost	$5,000 - $10,000
Potential Funding Sources	Local Funding
Potential Matching Sources	Local Funding
Lead Department	Public Works, OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofit with ability to connect with generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to generator
Cost Effectiveness	Backup generator will prevent loss of power and data to critical government buildings
Discussion	Introduction of a mobile back-up generator will allow the City of Celina or other critical facilities to function as close to normal as possible in the event of a massive power loss.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Develop and implement a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.

Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Implement all-hazards community education program, including information on mitigation activities.
Hazard(s) Addressed	Flooding, Tornado, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds, Earthquake, Expansive Soils, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, FEMA
Lead Department	OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits

Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Educating public on mitigation against loss of life and property will save government resources in the event of a disaster event
Discussion	Community education is important for reducing loss of life and property.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Celina Action Item	Analyze needs, develop and implement water conservation measures for new populations
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM
Implementation Schedule	2-3 years
Effect on Old Buildings	New constraints will be placed on water usage without compromising soil integrity.
Effect on New Buildings	New constraints will be placed on water usage without compromising soil integrity.
Cost Effectiveness	Expanded water and soil consistency standards will help the city of Celina plan for a boost in infrastructure and population and help maintain normal water levels
Discussion	As the City of Celina grows water conservation measures will encompass new infrastructure and residential/commercial areas. This plan implements conservation efforts that also maintain soil consistency, mitigating damage from expansive soils.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind

Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants

Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

4.6 Town of Fairview Action Items: 2016 Plan

Town of Fairview Action Item	Implement all-hazards public education program, including hazard mitigation activities for each identified hazard
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	3-B, 4-A, 4-B, 4-C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public Education is extremely effective for low cost
Discussion	The Town of Fairview will implement an all-hazards comprehensive public education program based on the hazards identified in this annex and what actions can be taken to mitigate impacts. This program will use a variety of means for distributing information, including social media, printed literature, and presentations to civic groups.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Town of Fairview Action Item	Implement tornado safe room education program
Hazard(s) Addressed	High Winds, Tornados
Goal/Objective	1-C
Priority	Medium
Estimated Cost	$500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-3 years
Effect on Old Buildings	Retrofit will be required on some structures

Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Moderate to high depending on level of acceptance
Discussion	Residential safe room shelters potentially decrease the likelihood of personal injuries and death during severe weather, tornado or hail events.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of Fairview Action Item	Implement and actively promote Nixle Notification alert system.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	1-A, 1-B, 3-B, 4-A, 4-B
Priority	Medium
Estimated Cost	$1,500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warnings will assist in saving lives for no cost.
Discussion	Weather/all-hazards notifications are a proven means to alert and warn citizens about severe weather conditions as well as other emergency and hazard information.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Update and enforce water conservation measures and implement public education outreach
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C, 3-C
Priority	Medium/Low
Estimated Cost	$1000
Potential Funding Sources	Operating Budget
Potential Matching Sources	North Texas Municipal Water District

Lead Department	Public Works, Code Enforcement
Implementation Schedule	1-2 years
Effect on Old Buildings	Water conservations measures would stabilize soils, mitigating damage to existing structures.
Effect on New Buildings	Water conservations measures would stabilize soils, mitigating damage to new structures.
Cost Effectiveness	Low-cost effort for increasing awareness of water restrictions.
Discussion	Town of Fairview will review water conservation measures and update as necessary. These conservation efforts regulate water used for maintaining soil consistency. Updates will be communicated to the public.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Develop and implement regulations for the construction of town buildings deemed “critical infrastructure”.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	1-C, 2-A, 2-B, 2-C, 2-D, 2-E
Priority	Medium/Low
Estimated Cost	$5000
Potential Funding Sources	Operating Budget
Potential Matching Sources	NCTCOG/FEMA
Lead Department	Emergency Management
Implementation Schedule	2-3 years
Effect on Old Buildings	May involve cascading retrofits
Effect on New Buildings	Strengthening construction requirements for new critical infrastructure will result in greater resiliency to hazards
Cost Effectiveness	Moderate to High.
Discussion	Town will develop and implement construction design regulations for new Critical Infrastructure, as defined by the EMC. Regulations would include elevating structures, reinforcing doors and windows, using flame-retardant, hail and wind resistant external materials, roof bracing, installing higher grade insulation, stabilizing foundations, installing lightning rods, and using low-flow technology for all plumbing.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood

Goal/Objective	2-A, 3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Engineering/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

4.7 Town of Farmersville Action Items: 2016 Plan

City of Farmersville Action Item	Develop and Implement a Comprehensive Public Education Program to Mitigate the Impacts of Each Identified Hazard.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Farmersville will develop a program for educating the public on our hazards and effective mitigation activities for each. Program will combine distributed written literature and social media to educate residents on hazards, their dangers, and how to mitigate against them to protect life and property.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Farmersville Action Item	Develop and implement water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years

Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Farmersville will develop stringent regulations/codes for water conservation.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Develop and Implement an Extreme Temperature Program
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Developing heating and cooling shelters as part of an extreme temperature program would allow threatened residents to reduce their vulnerability to extreme temperature hazards.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C, 2-D
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years

Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	By implementing its own program separate of that run by the North Central Texas COG, Farmersville would be able to directly target its residents for storm shelter rebates, ensuring their lives and property are protected against High Winds, Tornado, and Hail
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Farmersville Action Item	Purchase and install outdoor warning sirens to increase coverage for new development areas.
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000 per siren
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, user fees
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Could entail tower construction on existing buildings
Effect on New Buildings	None
Cost Effectiveness	High. Early warning is a key element in outdoor safety
Discussion	Installing sirens in areas of new development, Farmersville can ensure long-term reduction of vulnerability to life and personal property.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors

Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP would identify locations in Farmersville that are vulnerable to wildfire. These locations might include critical facilities, critical infrastructure, or other properties that are vital to the interests of Farmersville. By identifying these locations, targeted preparedness and response measures can be implemented.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake

Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents

Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

4.8 City of Frisco Action Items: 2016 Plan

City of Frisco Action Item	Expanding the Early Warning Sirens and Local Warning System to notify new populations of impending severe weather or imminent hazards to reduce the loss of life and mitigate the effects of the hazards.
Hazard(s) Addressed	Tornado, hail, high winds, lightning, wildfire
Goal/Objective	1-B
Priority	High
Estimated Cost	$40,000 - $50,000 each siren / total to be determined
Potential Funding Sources	City of Frisco annual budget, HMGP
Lead Department	Fire Department
Implementation Schedule	2-5 years
Effect on Old Buildings	Outdoor warning sirens do not have an impact on structures; they are designed to be heard outdoors only.
Effect on New Buildings	The outdoor warning sirens do not have an impact on structures; they are designed to be heard outdoors only.
Cost Effectiveness	The costs associated with maintaining an outdoor warning system are minimal and less expensive than total replacement of an outdoor warning system.
Discussion	The outdoor warning siren system is the most effective tool for outdoor notification, especially as relative to the fact that Frisco has many outdoor parks, trails, and nature areas that are used by citizens.

City of Frisco Action Item	Implement the Texas Individual Tornado Safe Room Rebate Program Locally
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	Medium
Estimated Cost	50% of cost (up to) $3,000 per shelter. Number of shelters to be determined
Potential Funding Sources	County Budget, HMGP, PDM, Homeowner, Work-in-kind
Lead Department	Building Inspections Department, Emergency Management, HMC
Implementation Schedule	2-5 years
Effect on Old Buildings	This action will improve the safety of existing homes with either in-ground or in-house shelters.
Effect on New Buildings	This action will improve the safety of new homes with either in-ground or in-house shelters.
Cost Effectiveness	The cost of this project is low compared to the potential benefits of reduction in personal injuries and/or deaths.
Discussion	Residential safe room sheltering can decrease potential personal injuries or deaths in the event of a tornado.

4.9 City of Josephine Action Items: 2016 Plan

City of Josephine Action Item	Develop and implement a comprehensive public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Josephine identified. The program would use a combination of distributed literature, social media, and civic presentations to educate residents on natural hazards and promote hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Josephine Action Item	Identify and establish heating and cooling centers for vulnerable populations
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources

Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Establishing heat and cooling shelters would allow special populations to reduce their vulnerability to extreme heat and cold
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Josephine Action Item	Increase outdoor warning siren coverage for new development areas
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Flooding, Lightning
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren. Number of sirens TBD.
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, donations
Lead Department	EMC
Implementation Schedule	1-2 years

Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand Josephine's siren coverage to new areas of development not currently protect by sirens.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years

Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP will Identify all structures and infrastructures that would be impacted by a potential wildfire, and identify potential targeted mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Develop, adopt, and enforce water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	City of Josephine will develop, adopt, and enforce water conservation ordinances, codes, and other regulatory measures to conserve water during times of drought.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds

Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000

Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

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4.10 City of Lavon Action Items: 2016 Plan

Lavon Action Item	Establish an AM radio station to broadcast weather conditions, hazards and road closures. Also will allow for broadcast of watches, warnings, evacuation routes, shelter information, and mitigation information.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	City Manager's Office
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	This project's cost effectiveness is in the lives it saves by alerting citizens to take shelter during extreme weather conditions.
Discussion	The AM Radio Station will reduce the threats to the citizens by alerting them to impending severe weather and warn citizens to seek appropriate shelter inside.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Reduce the impact of Severe Heat by utilizing Green Landscaping Roofing on all new city construction.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	2-B, 2-D
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	Local funding, HMGP
Lead Department	Public Works
Implementation Schedule	1-5 years
Effect on Old Buildings	No effect
Effect on New Buildings	The green landscaping will reduce overall effect of extreme heat on buildings, making cooling more efficient and reducing the use of electricity as well as reducing the effects of extreme summer heat on the citizens.
Cost Effectiveness	This project is cost effective in the reduction of hazards to citizens as well as the reduced power and electricity requirements for cooling buildings in summer heat.
Discussion	By utilizing landscaping on the roofs several significant benefits will be utilized. Including, insulation in the facility reducing the need for electricity, reducing the impact of extreme heat on the residents.

Status	Deferred – included in 2021 Action Items

Lavon Action Item	Develop and implement a Master Storm Water Drainage Plan for the City.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	High
Estimated Cost	$50,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	1-5 years
Effect on Old Buildings	Improved planning reduces potential flooding impacts
Effect on New Buildings	Mitigates flooding impacts
Cost Effectiveness	This project is extremely cost effective when compared to the property and agriculture/crop damage that will be avoided once the Master Storm Drainage plan enactment begins.
Discussion	There is currently no Master Storm Drainage Plan. By preparing and implementing this plan, it will reduce the occurrence of flash flooding and sudden inundation of areas. It will improve transportation during severe weather. Reduce vulnerabilities to those homeowners who are located in areas outside of flood zones but vulnerable to overflow flooding. And eliminate the rerouting of storm water to unattended areas.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Implement Building Codes requiring New Commercial Facilities to utilize Hail Resistant Roofing Materials.
Hazard(s) Addressed	Hail
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$5,000-$10,000
Potential Funding Sources	HMGP, Local budget
Lead Department	Emergency Management
Implementation Schedule	1-5 years
Effect on Old Buildings	Hail resistant roofing and window coverings will significantly mitigate the potential hazards of property damage as well as possible personal injury due to severe storm and hail.
Effect on New Buildings	Reduce impacts of hail on new structures
Cost Effectiveness	The cost effectiveness of the project will be the reduction of damage to property as well as reducing the need for debris disposal after a storm.

Discussion	The City of Lavon will enact codes for new development and city construction by requiring developers to install hail resistant roofing and window coverings, thus reducing the effect of severe weather and damage.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Retrofit an existing structure or construct a new City Hall built to withstand an EF2 Tornado.
Hazard(s) Addressed	Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	$5,000,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	3-5 years
Effect on Old Buildings	No effect on existing buildings unless retrofit
Effect on New Buildings	This would affect the new City Hall building, making it able to withstand an EF2 tornado, mitigating the loss of such critical infrastructure.
Cost Effectiveness	This project is cost effective because the current City Hall building is manufactured and will not withstand an EF2 tornado. City Hall houses many functions, documents, and records, and the potential loss of those greatly outweighs the cost of a new hardened structure.
Discussion	The current City Hall houses Administration, Clerical, Secretary, Devel. Services, Marshal Office, Council Court, PW and all the records are housed. The City Hall facility is currently two manufactured modular trailer buildings. The construction or retrofit of the new City Hall should include a hardened infrastructure to withstand known hazard extent levels.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Retrofit an existing structure or construct a new Public Works office and shop built to withstand a EF2 Tornado
Hazard(s) Addressed	Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	$1,000,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	2-4 years
Effect on Old Buildings	No effect on existing buildings unless retrofit

Effect on New Buildings	This would affect the new Public Works office and shop buildings, making them able to withstand an EF2 tornado, mitigating the loss of such critical infrastructure.
Cost Effectiveness	This project is cost effective because the current Public Works buildings are manufactured and will not withstand an EF2 tornado. These buildings house many functions, documents, and records, and the potential loss of those greatly outweighs the cost of a new hardened structure.
Discussion	The current Public Works office and shop contain all document and vital records. The offices are currently manufactured modular trailer buildings, and these would not withstand an EF2 tornado. In order to mitigate the effects of that hazard, the retrofit or construction of the new Public Works office and shop should include a hardened infrastructure to withstand known hazard extent levels.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Implement a program to inspect and clear excessive brush along high-voltage power lines and surrounding land, reducing the vulnerability to citizens located in potential wildland fire areas.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	2-C
Priority	High
Estimated Cost	$500,000/year
Potential Funding Sources	Local funding, HMGP
Lead Department	Public Works, Fire Department
Implementation Schedule	1-2 years
Effect on Old Buildings	This would mitigate the effects of wildland fire encroaching upon built up areas for existing construction.
Effect on New Buildings	This would mitigate the effects of wildland fire encroaching upon built up areas for new structures.
Cost Effectiveness	This project's cost effectiveness is seen in the management of wildland fire fuels to significantly reduce the damage or loss of buildings, structures, agriculture products, or homes to wildland fire.
Discussion	Currently the City of Lavon is susceptible to wildland due to the large amounts of family owned and un-maintained land along with the large farming industry. With the clearing of brush around high power voltage lines and surrounding land, this will create a fire break, greatly reducing the hazard and risks associated with possible ignition sources of wildland fire.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Develop and implement a community awareness program utilizing the City's existing communication outlets including the website and newsletter in order to mitigate the effects of wildland fire.
Hazard(s) Addressed	Wildland Fire

Goal/Objective	4-A, 4-B
Priority	High
Estimated Cost	$7,000-$10,000
Potential Funding Sources	City Budget
Lead Department	Development Services
Implementation Schedule	1-5 years
Effect on Old Buildings	This will greatly mitigate the effect of wildland fire on all buildings by increasing mitigation actions through public awareness and education campaigns, especially during periods of low rain and high heat.
Effect on New Buildings	This will greatly mitigate the effect of wildland fire on all buildings by increasing mitigation actions through public awareness and education campaigns, especially during periods of low rain and high heat.
Cost Effectiveness	This project is cost effective when compared to property damage, crop consumption, and potential loss of life that can be attributed to the hazards of wildland fire.
Discussion	The City of Lavon is highly susceptible to the dangers posed by wildland fire. By educating the public, they will be more aware of conditions, hazard assessment, and any applicable codes or burn ban enforcements applied by the city. This will mitigate the hazards associated with wildland fire.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

4.11 City of Lowry Crossing Action Items: 2016 Plan

Lowry Crossing Action Item	Implement Hazard Mitigation Education Series to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	2A, 2B, 2C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	FEMA
Potential Matching Sources	N/A
Lead Department	City Administration
Implementation Schedule	0 – 24 Months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Will be instrumental in planning and correction.
Discussion	In FY2022 Lowry Crossing is partnering with NCTCOG on a flood study of 17 miles of tributary within the city.
Status	Continue - Received supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Lowry Crossing Action Item	Implement Storm Shelter/Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1B
Priority	High
Estimated Cost	$3000/safe room
Potential Funding Sources	Federal Grants
Potential Matching Sources	NCTCOG
Lead Department	City Administration
Implementation Schedule	1-3 years
Effect on Old Buildings	Existing construction could have safe room added
Effect on New Buildings	New building could be constructed with safe rooms
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind.
Discussion	Develop list of storm shelter and safe rooms for emergency personnel to check safety of inhabitants.

Status	Continue - Will be included in 2021, however, some residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Lowry Crossing Action Item	Develop and adopt a drought contingency plan.
Hazard(s) Addressed	Drought
Goal/Objective	3A, 3B, 3C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Local Funds
Potential Matching Sources	
Lead Department	City Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Very low cost to ensure benefit of saving water for future generations.
Discussion	Drought contingency plan will limit water usage based on drought conditions.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Develop and implement an extreme temperature program that establishes heating and cooling centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	Protect existing and new properties from the effects of all natural hazards.
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	12-18 Months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 months – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low

Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years

Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

4.12 City of Lucas Action Item: 2016 Plan

City of Lucas Action Item	Develop a Community Wildfire Protection Plan (CWPP).
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$20,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, donations, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from Collin County and the Texas A&M Forest Service.
Implementation Schedule	18-36 Months
Effect on Old Buildings	Will reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Will reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show officials where to focus their efforts in preventing wildfire. Saving lives and protecting property is cost effective in the long-run.
Discussion	This project will become needed as the population in the Wildland Urban Interface area increases. This plan will protect life and property.
Status	Not yet started.

City of Lucas Action Item	Develop a wildfire and drought education program for residents.
Hazard(s) Addressed	Wildfire, Drought
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$5,000.00
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from the Texas A&M Forest Service
Implementation Schedule	0-12 months
Effect on Old Buildings	Will reduce vulnerability of existing buildings to wildfire and drought through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to wildfire and drought through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from wildfire and drought. Residents will be provided

	with supplies and materials from the NCTCOG KnoWhat2Do Program.
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop an extreme heat education program for residents.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to extreme heat through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to extreme heat through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from extreme heat. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop a winter weather/storm education program for residents.
Hazard(s) Addressed	Winter Storms
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HGMP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to winter weather/storms through resident education and behavior.

Effect on New Buildings	Will reduce vulnerability of new buildings to winter weather/storms through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from winter weather/storms. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop a Large Animal Rescue Plan and educate residents on actions to mitigate impact to large animals from severe weather and natural disasters.
Hazard(s) Addressed	Flood, Tornado, Winter Storm, Wildfire
Goal/Objective	4-B
Priority	Medium
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue
Implementation Schedule	18-36 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	This project will help Lucas Fire-Rescue educate owners of large animals about how to mitigate impact to their large animals from severe weather and natural disasters. This plan will also give Lucas Fire-Rescue the plans and directions on rescuing large animals around the City during disaster.
Status	Not yet started.

City of Lucas Action Item	Implement stricter building codes and standards to mitigate the impacts of hazards to buildings around the City.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, High Winds, Lightning, Tornado, Wildfire, Winter Storm
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000 - $15,000

Potential Funding Sources	Local
Potential Matching Sources	None
Lead Department	Planning and Zoning, Code Enforcement, Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Old buildings would be retrofitted to meet current or updated building code standards.
Effect on New Buildings	New buildings would be constructed to meet current or updated building code standards.
Cost Effectiveness	This is cost effective because it will protect life and property from future disasters.
Discussion	Updated and current building code standards will be continuously implemented in the City through retrofits to old buildings and initial construction to new buildings.
Status	The City of Lucas has adopted current building code and will continue to adopt the most current building codes. This action item will be included in future HazMAP updates.

City of Lucas Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce the vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low.
Discussion	Study results will identify information to determine mitigation projects
Status	No longer a relevant action item to the City of Lucas. This item will not be included as a 2021 Action Item.

City of Lucas Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants and/or state grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management, Public Works, Planning and Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils. This soil analysis will protect life and property.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Not yet started.

City of Lucas Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Emergency Management, Planning and Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low

Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	No longer a relevant action item to the City of Lucas. This item will not be included as a 2021 Action Item.

4.13 City of Melissa Action Item: 2016 Plan

City of Melissa Action Item	Adopt and promote public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Program will include information on hazard mitigation and what actions can be taken to reduce impacts on people and property.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Melissa Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in the safety of citizens who are outdoors

Discussion	Outdoor warning sirens help prevent loss of life during severe storms.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Develop and implement an extreme temperature program that identifies both safe locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	May require retrofit
Effect on New Buildings	None
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	12 to 24 months
Effect on Old Buildings	Retrofit will increase life safety
Effect on New Buildings	Will add additional protection to reduce injury and loss of life
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.

Discussion	Residential safe room programs help prevent loss of life during tornado or severe storm.
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Melissa Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	12 - 18 months

Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.

Status	Deferred – will be included in 2021 Plan
City of Melissa Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works

Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with local water supplies to increase public education on drought. Develop and implement mandatory water restrictions for water conservation.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD

Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	

4.14 City of Murphy Action Items: 2016 Plan

City of Murphy Action Item	Increase the percentage of population covered by Outdoor Warning Sirens by relocating one siren and purchasing and installing an additional siren.
Hazard(s) Addressed	Tornado, High Winds, Hail
Goal/Objective	1-B
Priority	High
Estimated Cost	$38,000
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Fire/OEM
Implementation Schedule	6-18 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The city has four tower sites currently, but has a gap in coverage in some areas. Relocating an existing site and adding one site would allow full coverage for the city and its residents.
Status	100% Complete

City of Murphy Action Item	Obtain portable generators to ensure continuity of operations at critical facilities.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Hail, Earthquake, Lightning, Dam Failure
Goal/Objective	1-E
Priority	High
Estimated Cost	$7,500 each
Potential Funding Sources	HGMP, HMA, General Fund
Potential Matching Sources	Local, In-kind
Lead Department	Fire
Implementation Schedule	3-6 Months
Effect on Old Buildings	Would require retrofit for generator hookups
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective
Discussion	Natural hazards can create power outages for extended periods of time.

Status	Not started and no longer a viable action item. Will be removed from Plan

City of Murphy Action Item	Purchase and Install CASA-WX Weather Radar
Hazard(s) Addressed	Tornado, High Winds, Hail
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$2.5 Million
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Fire/OEM
Implementation Schedule	3-6 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.
Status	No longer a viable project for Murphy, will be removed from Plan on 2021

City of Murphy Action Item	Implement the Residential Safe Room Rebate Program locally
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	Medium
Estimated Cost	$3,000 per safe room
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	City Council – City Manager
Implementation Schedule	1-3 years
Effect on Old Buildings	Some buildings may be modified for shelter retrofit
Effect on New Buildings	New home construction would result in safer houses

Cost Effectiveness	Moderate: Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornados or high winds events.
Discussion	Support the existing active FEMA 320 safe room rebate program for North Central Texas by helping offset the cost to the resident.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Murphy Action Item	Develop and implement seasonal program for identifying and removing tree limbs that threaten infrastructure.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, High Winds, Lightning
Goal/Objective	1-D
Priority	Medium
Estimated Cost	$25,000
Potential Funding Sources	HGMP, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Parks
Implementation Schedule	3-6 Months
Effect on Old Buildings	Reduce potential for power line/debris/limb damage to existing buildings during extreme weather
Effect on New Buildings	Reduce potential for power line/debris/limb damage to new construction during extreme weather
Cost Effectiveness	Very cost effective in mitigating tree limbs prior to severe weather events.
Discussion	Severe storms, winter storms, and wildfires damage tree limbs and power lines that damage homes, buildings, vehicles and create power outages when they fall. Roads become impassable due to the obstructions created by the falling limbs and charged power lines as well. The ability to mitigate these overgrowth items and strategically located limbs will lessen the effects of the hazards.
Status	Completed

City of Murphy Action Item	Retrofit the existing Emergency Operations Center to harden it against multiple hazards
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	2-B
Priority	High
Estimated Cost	$30,000-$150,000

Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, In-kind, Bond
Lead Department	Public Works
Implementation Schedule	12 – 24 months
Effect on Old Buildings	Existing building would be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	N/A
Cost Effectiveness	Low cost effectiveness for construction, but very cost effective for 'command structure' to remain intact to operate through emergency events
Discussion	Dry floodproofing ground floor; reinforcing doors and windows; installing flame-retardant, hail and wind resistant external materials (window coatings, roofing); roof bracing; higher grade insulation; foundations stabilizers; lightning rods; soil stabilizing plants, and low-flow plumbing.
Status	Partially completed and will continue to perform enhancements. Will be included in 2021 Plan.

City of Murphy Action Item	Replace undersized culverts at five locations.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$620,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained
Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 5 separate projects that have been identified as insufficient.
Status	Mostly completed and will be included in 2021 Update

City of Murphy Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in the 2021 Plan

City of Murphy Action Item	Drainage channel improvements and additions.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$3.11 Million
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	12 – 18 Months
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained

Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 4 separate projects that have been identified as insufficient.
Status	Mostly completed and will be included in 2021 Update

City of Murphy Action Item	Purchase and install lightning detection equipment for city parks
Hazard(s) Addressed	Lightning
Goal/Objective	1-A
Priority	Moderate
Estimated Cost	$10,000
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local, in-kind
Lead Department	Public works
Implementation Schedule	12 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The city has two major parks with outdoor sporting event capabilities, pavilions and an amphitheater where multiple events are held throughout the year. Providing a secondary source of severe weather information such as lightning indication could prevent injury or death to one or more of our citizens or guests
Status	No longer a viable project. Will not be included in the 2021 Plan

City of Murphy Action Item	Develop and implement a water conservation plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months

Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and protection of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation and work with local water supplies to increase mitigation measures for drought. Develop and implement mandatory water restrictions/codes for water conservation measures that address soil stabilization.
Status	Deferred – will be included in the 2021 Plan

4.15 Town of New Hope Action Items: 2016 Plan

Town of New Hope Action Item	Adopt and promote public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds General fund
Lead Department	Town Council
Implementation Schedule	Yearly effort
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	The utilization of social media will be key in this program. Program will include educational information about hazard awareness and mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

Town of New Hope Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornado/High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Residents receiving grant
Lead Department	N/A
Implementation Schedule	1-3 Years
Effect on Old Buildings	Enhance Safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelter potentially decrease personal injuries and death during severe weather, tornados, or high wind events

Discussion	
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of New Hope Action Item	Develop and Implement an extreme temperature program that identifies both locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2D
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General fund
Lead Department	Town Council
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources, including but not limited to emergency generators.
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	Low
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Partial payment by receiving party
Potential Matching Sources	Local funds, General Fund, citizen cost-share
Lead Department	Town Council
Implementation Schedule	2-5 years

Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios could be especially useful to provide information about severe weather as well as provide other emergency and hazard information to residents without use of their cell phones or access to Internet.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	Medium
Estimated Cost	$25,000 per siren
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General Fund, Developer cost
Lead Department	Town Council
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens notified of hazards.
Discussion	Obtaining grants will be key to implementation of outdoor warning siren coverage due to high costs and New Hope's ow fiscal capability assessment scores.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the County.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2-A, 3-A
Priority	Low
Estimated Cost	$50,000

Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Identify all structures and infrastructures that would be impacted by a potential dam failure. There are currently no dams located in or immediately surrounding New Hope.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show town officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	With assistance from Collin County Fire Marshall, identify mitigation strategies for all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought

Goal/Objective	3-C, 4-B
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on North Collin Special Utility District recommendations. Use of social media will be key in implementing this plan.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A,
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Funds
Lead Department	Town Council
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction. Expansive soils are not prevalent in New Hope.
Status	Deferred – will be included in 2021 Plan

4.16 City of Parker Action Items: 2016 Plan

City of Parker Action Item	Develop and implement a comprehensive public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Parker identified as being vulnerable to. The program would use a combination of distributed literature, social media, and civic presentations to educate residents on natural hazards and promote hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Parker Action Item	Establish centers for vulnerable residents to mitigate the effects of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources

Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling and heating shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Parker Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren, number of sirens TBD
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC

Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand Parker's siren coverage to new areas of development not currently protected by sirens.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2-A, 3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.

Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify and mitigate all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing, soil conditioning around foundations
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP

Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	

City of Parker Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A

Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

4.17 City of Princeton Action Items: 2016 Plan

City of Princeton Action Item	Adopt and promote a public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Program will include information on hazard mitigation and what actions can be taken.
Status	Utilize as able regional, state, and federal public education information. Will be included in 2021 Plan

City of Princeton Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Fire Department/EMC
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – Will be included in 2021 Plan

City of Princeton Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Princeton Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-B
Priority	High
Estimated Cost	$25,000 each
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	None
Effect on New Buildings	None

Cost Effectiveness	Cost is low compared to lives saved and reduced injuries
Discussion	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2A, 3C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	3-4 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	2-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing

Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Deferred – Will be included in 2021 Plan

City of Princeton Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2A, 3A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds

Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High

Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – Will be included in 2021 Plan

4.18 Town of Prosper Action Items: 2016 Plan

Town of Prosper Action Item	Adopt and promote a public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Dam Failure, Flooding, High Wind, Lightning, Wildfire, Tornado, Hail, Extreme Heat, Drought, Winter Storms, Earthquakes, Expansive Soils
Goal/Objective	4A, 4B, 4C
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General Fund, EMPG, PDM
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Fire Department
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Extreme cost effectiveness
Discussion	Share perceptions of disaster myths, increases information gathering. Program will include information about mitigation actions for each hazard.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

Town of Prosper Action Item	Develop, implement, and enforce ordinances to restrict the use of public water resources for non-essential usage, such as washing cars, landscape, and filling swimming pools
Hazard(s) Addressed	Drought
Goal/Objective	2A, 2C, 3C
Priority	Moderate
Estimated Cost	$45,000
Potential Funding Sources	General Fund, EMPG, other grants
Potential Matching Sources	Local donations, in-kind matching
Lead Department	Public Works, OEM
Implementation Schedule	2-5 years
Effect on Old Buildings	May require retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and lawn sprinklers

Cost Effectiveness	High. With millions of dollars potentially lost due to drought, this mitigation technique would have a long term benefit on local farmers and citizens
Discussion	Additional project to include working with builders to encourage drought –tolerant landscape to reduce water usage with incentives
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Implement individual/public tornado safe rooms and location awareness
Hazard(s) Addressed	Tornado, High Wind
Goal/Objective	1C, 2D, 4A, 4B,
Priority	High
Estimated Cost	Up to $3,000 per residential safe room/$1,000,000 public retrofit
Potential Funding Sources	FEMA, Local grants, PDM
Potential Matching Sources	Local Funding, Donations, Resident Match
Lead Department	Engineering
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential/public structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	High, Residential safe room shelters decrease personal injuries and death during severe weather, tornadoes, or high winds
Discussion	Possible FEMA rebate program
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of Prosper Action Item	Protect citizens from extreme weather by building covered patios in public parks
Hazard(s) Addressed	Extreme Heat, Hail, High Winds, Lightning
Goal/Objective	2D
Priority	High
Estimated Cost	$50,000
Potential Funding Sources	PDM, General Budget, State and Federal Grants
Potential Matching Sources	Citizen cost-share, Donations
Lead Department	Public Works/Parks
Implementation Schedule	2-3 years
Effect on Old Buildings	Potentially add covered patios to existing small structures

Effect on New Buildings	N/A
Cost Effectiveness	Cost is low compared to loss of life from heat illness and debris injuries
Discussion	Covered patios are an effective means of providing temporary relief from severe weather
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Purchase and Distribute NOAA Radios to Vulnerable Populations
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	3C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMGP, PDM
Potential Matching Sources	Local funds, General Budget, Donations, citizens cost-share
Lead Department	Fire Department, Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	moderate
Discussion	Early warning, hazard and mitigation information, and reliable communications have been established to reduce loss of life, injuries, and property damage
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Develop, Implement, and Enforce Private Residential and Commercial Construction Requirements
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	1C, 2C
Priority	Moderate
Estimated Cost	$25,000
Potential Funding Sources	PDM, EMGP
Potential Matching Sources	General budget, In-Kind

Lead Department	Development Services, OEM
Implementation Schedule	6-9 Months
Effect on Old Buildings	New standards could be used to drive retrofitting
Effect on New Buildings	Buildings will be safer and more resilient in face of hazards
Cost Effectiveness	High
Discussion	Develop and adopt building codes to harden private construction based on the hazards identified in this annex such as hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning
Status	Town of Prosper has adopted current building code and will continue to adopt the most current building codes – will continue to be in future plans and updates

Town of Prosper Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2A, 3A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred will be included in 2021 Plan (50,000)

Town of Prosper Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Status	Deferred – will be included in 2021 Plan

4.19 Town of St. Paul Action Items: 2016 Plan

Town of St. Paul Action Item	Adopt and promote public education program.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	4A, 4B, 4-C
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Also the utilization of social media will be key in this program. Program will include information about mitigation actions and education.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Town of St. Paul Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-C
Priority	High
Estimated Cost	$3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	Town Administration
Implementation Schedule	2-3 years
Effect on Old Buildings	Some buildings modified for safe room retrofit
Effect on New Buildings	Buildings constructed with safe rooms
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program

Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

Town of St. Paul Action Item	Purchase of a CASA (WX) Weather Radar system
Hazard(s) Addressed	Hail, Tornadoes, Wildfire, Flooding, Lightning, Dam Failure
Goal/Objective	1-A, 3-C
Priority	High
Estimated Cost	$550,000
Potential Funding Sources	Local Funding, Federal Funding, HMPG
Potential Matching Sources	Local Grants
Lead Department	Town Administration
Implementation Schedule	12-36 Months
Effect on Old Buildings	n/a
Effect on New Buildings	Increase response decisions by 100%
Cost Effectiveness	Cost effectiveness is low compared to the benefits.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA WX radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.
Status	No longer viable project for St. Paul

Town of St. Paul Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Populations, Businesses, and Critical Infrastructure.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Expansive Soils, Earthquake, Dam Failure, Flooding
Goal/Objective	3-C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share

Lead Department	Town Administration
Implementation Schedule	12-18 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning saves lives, which outweighs the cost of the radios.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens about severe weather, civil emergencies and hazard information. It is impossible to quantify the value of a human life or value of an injury.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$65,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind, grants
Lead Department	Town Administration
Implementation Schedule	18-36 Months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show county officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around lake development properties.
Discussion	This project will become increasingly needed as development around Richland Chambers (Tarrant County Water Supply) increases.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors

Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Town Administration
Implementation Schedule	12-18 Months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000-$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop, implement, and enforce building codes that would prevent building deterioration from structure-impacting hazards.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	2-C, 3-C
Priority	Low

Estimated Cost	$5,000- $7,500
Potential Funding Sources	General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration
Implementation Schedule	12 Months
Effect on Old Buildings	New building codes would allow for existing buildings to be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	New building codes would allow for new buildings to be constructed to mitigate against structure-impacting
Cost Effectiveness	Low - Benefits outweigh costs
Discussion	Building codes would help to promote better building standards such as including hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	4-C
Priority	Medium
Estimated Cost	$1,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with local water supplies to implement mandatory water restrictions
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement storm water management on creek waterways
Hazard(s) Addressed	Flooding
Goal/Objective	2-D, 2-E, 3-C
Priority	Medium
Estimated Cost	$75,000
Potential Funding Sources	HMGP, General Funds
Potential Matching Sources	Local funds, In-kind match
Lead Department	Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	My prevent flooding of existing structures
Effect on New Buildings	May prevent flooding of planned development areas
Cost Effectiveness	Low compared to life safety benefits
Discussion	Project would prevent erosion, stopping expansion of the floodplain
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement debris management program targeting stream banks at bridges
Hazard(s) Addressed	Flooding
Goal/Objective	2-E, 3-C
Priority	Medium
Estimated Cost	$534,000
Potential Funding Sources	HMGP, General Funds
Potential Matching Sources	Local funds, In-kind match
Lead Department	Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	Could prevent flooding and disruption to transportation
Effect on New Buildings	None
Cost Effectiveness	Low compared to life safety benefits
Discussion	Town of St. Paul needs to ensure clear waterways in order to prevent buildup of debris and materials that could cause flooding and contribute to damage to bridges.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 months – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	. Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

4.20 City of Wylie Action Items: 2016 Plan

City of Wylie Action Item	Add outdoor warning sirens to meet the needs of the growing population in newly developed areas and/or subdivisions.
Hazard(s) Addressed	Tornado, Hail, High Winds, Dam Failure, Lightning, Flooding, Wildfire
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$30,000 per siren
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Outdoor warning systems will help alert the public to reduce personal and property damage before a disaster strikes.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Adopt and implement water conservation regulations
Hazard(s) Addressed	Drought
Goal/Objective	2-C, 3-C
Priority	High
Estimated Cost	$7,500 to $15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Minimal compared to benefit to community
Discussion	This will mitigate against drought conditions.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$7,500-$15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Wylie Action Item	Develop and implement an extreme temperature program that provides resources and identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, NPO donations, In-kind
Lead Department	Emergency Management, Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials

Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years

Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party

Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

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National Flood Insurance Program (NFIP) Compliance



The National Flood Insurance Program (NFIP)

The National Flood Insurance Program is a federally run program which enables property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

Community Participation

A community applies for participation in the National Flood Insurance Program (NFIP) either as a result of interest in eligibility for flood insurance or as a result of receiving notification from FEMA that it contains one or more Special Flood Hazard Areas (SFHAs). In order for a community to apply for and receive participation in the NFIP, that community must adopt resolutions or ordinances to minimally regulate new construction in identified SFHAs. FEMA works closely with state and local officials to identify flood hazard areas and flood risks. The floodplain management requirements within the SFHA are designed to prevent new development from increasing the flood threat and to protect new and existing buildings from anticipated flood events.

When a community chooses to join the NFIP, it must require permits for all development in the SFHA and ensure that construction materials and methods used will minimize future flood damage. Permit files must contain documentation to substantiate how buildings were actually constructed. In return, the Federal Government makes flood insurance available for almost every building and its contents within the community.

Communities must ensure that their adopted floodplain management ordinance and enforcement procedures meet program requirements. Local regulations must be updated when additional data are provided by FEMA or when Federal or State standards are revised

A more in-depth description of each jurisdiction’s NFIP program is addressed in the jurisdictional annexes.

Chapter Five: Plan Maintenance

5.1 Monitoring, Evaluating and Updating the Plan

In compliance with requirement *§ 201.6(c)(4)(i)*, Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions, is responsible for monitoring the implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the Collin County Commissioners Court and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by the County and participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator will be responsible for ensuring the mitigation action items and implementation are monitored, evaluated, and reviewed biannually by emailing all the participating jurisdictions for updates on their individual action items. The progress of the action items will be tracked electronically as “in progress”, “deferred” or “completed”. Project implementation will be included in the Mitigation Strategies for the 5 year update of the plan.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the Hazard Mitigation Planning Team (HMPT), whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Collin County will provide information on the implementation status of each action included in the plan. As part of the annual monitoring, review and evaluation process, Collin County will provide reports regarding implementation of actions and project completion dates for the plan. Also, as part of the evaluation, the HMPT will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed.

At least once every five years the HazMAP will undergo a major update. During this process, all sections of the plan will be updated with current information and analyses, and new and/or modified mitigation plans will be developed. The revised collaborative plan will be submitted for state and federal review and approval. It will then be presented for approval to the Collin County Commissioner’s Court and to the city councils of the respective incorporated cities included on the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans, with submission to the local governing body for approval. The plan will be updated every five years in accordance with federal requirements.

** Each individual city’s maintenance schedule is included in their annex.

5.2 Plan Incorporation into Existing Planning Mechanisms
(In compliance with 201.6(c)(4)(ii))

Based on the requirements set forth in § 201.6(c)(4)(ii), the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The Hazard Mitigation team will use an established process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Past and present Collin County Hazard Mitigation Action Plans discuss incorporating mitigation activities through various vehicles. Local planning mechanisms identified include: building codes, planning and zoning ordinances, fire codes, NFIP, and capital improvement plans. Information was also incorporated into the Collin County Emergency Operations Plan and the State of Texas Hazard Mitigation Action Plan. This integration and incorporation strategy will continue with all members of the Collin County HazMAP, provided there is sufficient political, fiscal, and administrative capital to do so.

The process described here is the same as was used since the last planning update.

**Each jurisdiction's individual integration plan can be found in their respective annex.

Once the plan is adopted, the HMPT will coordinate implementation with the engineering, planning, and emergency management departments for the county, participating jurisdictions, river authorities, and drainage districts.

5.3 Continued Public Involvement
(In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* the plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Chapter Six: Individual Jurisdictional Annexes

Chapter Six contains the individual jurisdictional annexes. The annexes were developed by each individual jurisdiction in order to provide a greater level of detail specific to the jurisdiction. Each annex contains seven sections.

Section One provides a brief introduction to jurisdiction and contents of the annex

Section Two covers the planning process and those involved. Elements included in this section are: plan development and adoption process, planning organization, existing data and plans incorporation, the planning committee, hazard mitigation team members, external stakeholders, the dates of planning meetings, and public involvement. The planning process documentation is contained in Appendix A, located at the back of the plan. (Requirements: §201.6(c)(1)), §201.6(b)(2)), §201.6(b)(1)), §201.6(b)(3)), §201.6(c)(4)(iii)), and §201.6(c)(4)(i)).

Section Three is the hazard identification and risk assessment. This section contains the Priority Risk Index, which allows each individual jurisdiction to rank the hazards in their area; vulnerability narratives, which identifies points of vulnerability in each jurisdiction for each hazard; and the asset identification and vulnerability assessment. (Requirements §201.6(c)(2)(i)) and §201.6(c)(2)(ii))

Section Four provides a summary of jurisdictional capabilities. Elements in this section include: legal and regulatory capabilities, administrative and technical capabilities, fiscal capabilities, and implementation capabilities. (Requirement §201.6(c)(3)).

Sections Five and Six provide the jurisdictional mitigation strategies and action items. The elements included are: mitigation goals and the action items associated with those goals. Additionally, Section Six includes National Flood Insurance Program (NFIP) compliance information. (Requirements §201.6(c)(3)(ii)), §201.6(c)(3)(i)), §201.6(c)(3)(iv)), and §201.6(c)(3)(iii)).

Section Seven is the maintenance portion of the annex. Included are: plan monitoring, evaluating, and updating; and plan incorporation mechanisms. (Requirements §201.6(c)(4)(i)) and §201.6(c)(4)(ii)).

Jurisdictional Annexes:

A. Unincorporated Collin County

B. Allen

C. Anna

D. Blue Ridge

E. Celina

F. Fairview

G. Farmersville

H. Frisco

I. Josephine

J. Lavon

K. Lowry Crossing

L. Lucas

M. Melissa

N. Murphy

O. New Hope

P. Parker

Q. Princeton

R. Prosper

S. St. Paul

T. Wylie

Annex A: Unincorporated Collin County

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. Collin County participated in the Collin County HazMAP Planning Team (HMPT) by representing the unincorporated areas of the County. In addition to the countywide hazards and strategies discussed in the previous section, this annex serves as a complete hazard mitigation planning tool for the unincorporated areas of Collin County. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Collin County has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Collin County officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and the local newspaper.

In accordance with Part 201.6(c) (5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data were gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
Nationals Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface

Source	Data
National Inventory of Dams	Dam Information

Planning Team

This Hazard Mitigation Action Plan was developed by the Collin County Hazard Mitigation Planning Team and team members dedicated to the unincorporated areas of the county. The efforts of the planning team members for unincorporated Collin County were led by the Collin County Assistant Emergency Manager.

The Planning Team was assembled in September, 2020 with representatives from county departments, local hazard mitigation committees, and the general public. The Collin County Fire Marshal/Emergency Management Office acted as the lead plan facilitator, providing hazard mitigation planning services. Table 2.2 provides a list of the primary representative for each department on the planning team for unincorporated Collin County.

Table 2.2 Hazard Mitigation Team – Primary Representatives

Representing	Position	Role
Fire Marshal/Emergency Management	Emergency Manager	Plan Supervision
Fire Marshal/Emergency Management	Assistant Emergency Manager	Plan Supervision/Plan Development
GIS	GIS Analyst	Data Analysis
Fire Marshal/Emergency Management	Emergency Management Intern	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions, including the unincorporated areas of Collin County, by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Manager to provide technical assistance and necessary data to the planning team and local committees.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the planning team and local committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and local committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the cities and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified

risks.

- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

Stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
American Red Cross	Field Representative	Review of plan
City of Plano	Emergency Management Specialist	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, Collin County organizations above are committed to accomplishing the following activities:

- Appoint members to a coordinating team to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County:

- Collin County Kickoff Meeting – August 12, 2020
- Collin County HazMAP Planning Meeting – Week of 11/05/2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 1/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The HMPT members for unincorporated Collin County identified several natural hazards and man-made hazards that could affect the unincorporated areas of the county. The HMPT decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2

		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for Unincorporated Collin County

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	1	1	1	0.7
Drought	2	0	2	3	1.4
Earthquake	0	2	3	3	1.75
Expansive Soils	3	0	0	3	1.2
Extreme Heat	3	2	0	3	1.9
Flooding	2	0	1	1	0.95
Hail	2	1	3	3	2
High Winds	3	0	1	1	1.25
Lightning	3	0	0	0	0.9
Tornado	1	2	3	1	1.85
Wildfire	3	0	3	0	1.65
Winter Storms	2	0	0	3	0.9

The conclusions drawn from the hazard profiling process for Collin County jurisdictions resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in

relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Collin County.

Table 3.3 Hazard Rankings for Unincorporated Collin County

High Risk (PRI 2 - 3)	Hail
Moderate Risk (PRI 1.01 -1.9)	Drought Earthquake Extreme Heat High Winds Tornado Wildfire
Low Risk (PRI 0.50 – 1)	Dam Failure Expansive Soil Flooding Lightning Winter Storm
Negligible to No Risk (PRI 0 – 0.49)	None

Changes in Development and Priorities (Requirement §201.6(d) (3))

Collin County was a participating jurisdiction in the 2011 and 2016 Collin County Hazard Mitigation Action Plan. Since then, Collin County has completed one of their original action items in an effort to lower vulnerability on populations and property from natural hazards.

The development and implementation of this project directly led to lower vulnerability for residents and property located in unincorporated Collin County.

New priorities are noted and ranked in each new action item, Section 6. Except for actions completed or cancelled, other priorities remain the same as in the previous version of this plan.

Due to recent changes in annexation laws, Collin County can expect our population to continue to grow in the unincorporated areas. This is due to the fact, that cities no longer and force annex property into their jurisdiction. It was always assumed that the cities would continue to annex and the unincorporated areas would get smaller; however, it must be assumed that the population in the unincorporated area will remain flat, if not increase moving forward.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability unincorporated Collin County faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure Development of the downstream areas necessitates the original low hazard classifications to be changed to higher hazard classifications because the dams are no longer adequate for the increased downstream risks. NRCS data shows that there are 6 dams in Collin County that are no longer adequate for increased downstream risks. This percentage could actually be higher because detailed current evaluations of NRCS dams have not been conducted due to resource limitations. In addition, many of these inadequate dams have not been updated because many of the legally responsible entities of these dams do not have sufficient mechanisms funding for updates, or even adequate maintenance, in some cases. Soil and Water Conservation Districts do not have any statutory funding capability of their own, and counties, especially those with small populations and multiple dams, are not able to generate the resources needed to sustain a consistent and comprehensive effort upgrade these structures. While no record could be found of any previous dam failures in Collin County, three things are clear:

- Many of the dams in Collin County are nearing the end of their designed project lives.
- Many of these dams are in desperate need of detailed evaluations and consistent maintenance
- Increased development downstream of the dams has put more people, property, and infrastructure at risk.

Collin County is responsible for 38 high hazard dams identified by the NRCS in both the unincorporated County area and in several cities due to the use of easements and the Emergency Operations Plans for those dam sites. While a dam failure event would affect jurisdictions not participating in the Collin County Local Mitigation Strategy, the HMT has chosen to include all High Hazard dams the county is responsible for in emergency planning for plan incorporation purposes.

High Risk FRS in Unincorporated Collin County

Dam Name	Site Acres	Year Completed	Sed. Pool Elevation	Acres	Flood Pool Elevation	Acres	Easement Elevation	Acres	Top of Dam Elevation
Little Elm & Laterals WS NRCS Site 18A	5.3	1970	728.0	13.0	743.0	51.0	745.0	60.0	747.4
East Fork Above Lavon WS NRCS Site 1C	6.1	1964	688.3	26.5	701.5	80.5	703.5	93.5	705.7
East Fork Above Lavon WS NRCS Site 2A	4.3	1958	648.6	31.0	668.4	155.0	670.4	165.0	673.4
East Fork Above Lavon WS NRCS Site 2B	4.7	1959	630.5	16.0	642.0	36.0	644.0	41.2	647.0
East Fork Above Lavon WS NRCS Site 3A	3.2	1958	693.2	13.9	702.4	25.4	704.4	32.0	708.0
East Fork Above Lavon WS NRCS Site 3B	5.9	1958	645.0	22.0	661.4	40.7	663.4	42.7	673.7
East Fork Above Lavon WS NRCS Site 3C	6.1	1958	621.1	19.2	633.8	48.0	635.8	54.2	638.3
East Fork Above Lavon WS NRCS Site 3D	5.0	1958	597.3	17.3	608.1	36.9	610.1	40.8	613.0

Dam Name	Site Acres	Year Completed	Sed. Pool Elevation	Acres	Flood Pool Elevation	Acres	Easement Elevation	Acres	Top of Dam Elevation
East Fork Above Lavon WS NRCS Site 3E	3.3	1967	582.3	4.5	594.5	24.6	596.5	29.0	597.4
East Fork Above Lavon WS NRCS Site 4	13.1	1959	610.5	33.0	626.5	108.0	628.5	120.0	632.6
East Fork Above Lavon WS NRCS Site 5A	5.3	1958	575.2	23.5	590.0	48.0	592.0	55.0	594.9
East Fork Above Lavon WS NRCS Site 8A	10.7	1968	664.5	35.0	679.0	116.0	681.0	129.3	683.0
East Fork Above Lavon WS NRCS Site 8G	11.1	1955	717.5	39.8	732.0	125.3	734.0	144.3	737.4
East Fork Above Lavon WS NRCS Site 9	6.6	1951	636.5	17.1	650.0	46.3	652.0	50.9	655.0
East Fork Above Lavon WS NRCS Site 10	8.5	1952	648.0	14.9	662.0	43.8	664.0	49.0	667.0
East Fork Above Lavon WS NRCS Site 11	8.5	1952	644.0	36.3	656.0	72.2	658.0	80.0	661.0
East Fork Above Lavon WS NRCS Site 12	7.4	1952	638.0	18.8	650.0	49.6	652.0	56.6	655.0
East Fork Above Lavon WS NRCS Site 14	4.0	1951	630.0	13.6	642.0	35.8	644.0	40.9	647.0
East Fork Above Lavon WS NRCS Site 15	4.5	1951	614.0	22.7	626.0	49.3	628.0	54.5	631.0
East Fork Above Lavon WS NRCS Site 16	4.2	1951	613.0	28.6	624.0	55.8	626.0	59.6	629.0
East Fork Above Lavon WS NRCS Site 30	8.5	1965	655.7	18.0	664.3	40.0	666.3	45.2	667.0
East Fork Above Lavon WS NRCS Site 31	7.6	1965	646.5	12.5	659.3	32.3	661.3	35.5	663.2
East Fork Above Lavon WS NRCS Site 32	6.0	1966	637.8	17.0	651.0	42.0	653.0	45.9	655.1
East Fork Above Lavon WS NRCS Site 32A	3.6	1966	628.3	10.0	639.0	22.0	641.0	26.0	642.4
East Fork Above Lavon WS NRCS Site 33	6.5	1966	642.3	23.0	653.0	53.0	655.0	62.0	656.9
Sister Grove Creek WS NRCS Site 3	9.9	1963	630.5	19.0	638.5	40.8	640.5	48.5	643.0
Sister Grove Creek WS NRCS Site 4	3.7	1960	621.7	15.0	630.0	35.0	632.0	42.0	633.5
Sister Grove Creek WS NRCS Site 5	10.0	1952	649.0	11.0	666.0	55.0	668.0	61.4	671.0
Pilot Grove Creek WS NRCS Site 28	13.5	1964	572.5	46.0	585.0	144.0	587.0	168.0	590.0
Pilot Grove Creek WS NRCS Site 79	11.1	1965	561.7	20.8	573.4	66.5	575.4	74.0	577.3
Pilot Grove Creek WS NRCS Site 80	12.7	1965	564.8	16.9	578.4	53.4	580.4	58.0	582.5
Pilot Grove Creek WS NRCS Site 82	4.7	1967	584.4	80.0	589.0	111.0	591.0	130.0	592.5
Pilot Grove Creek WS NRCS Site 83A	6.3	1967	590.5	21.5	599.5	54.5	601.5	62.5	603.0
Rowlett Creek WS NRCS Site 4	16.1	1956	506.4	53.0	525.8	347.0	527.8	386.0	533.1
Rowlett Creek WS NRCS Site 5	7.1	1956	517.1	26.6	526.0	88.5	528.0	104.3	532.8
Rowlett Creek WS NRCS Site 7	13.4	1957	487.2	59.0	504.0	225.0	506.0	257.5	509.9
U. East Fork Laterals WS NRCS Site 2	8.3	1959	498.7	51.0	512.0	174.0	514.0	204.0	516.5

Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Unincorporated Collin County are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni and the Trinity Aquifer are water sources for Unincorporated Collin County and are vulnerable to drought. In turn, the unincorporated area of Collin County's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake While there are no known reports of seismic activity in the county, there is the possibility that seismic events could happen anywhere in the planning area. Buildings constructed under older building codes, dams, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity. Building codes in the Collin County do not typically meet any type of seismic standards. Even a small earthquake could result in significant damage and impacts.

Expansive Soils The entire planning area is vulnerable to expansive soils. All property has the potential to be vulnerable to expansive soils.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding Collin County has identified several low water crossings that are subject to periodic flash flooding. Affected areas differ with each storm as there are several different branches and tributaries of rivers and creeks subject to overflow, and also are dependent upon which area receives the rain. These areas are low water crossings mainly on unimproved county roads that consist of dirt, rock, and caliche (sedimentary rock which cements together other materials, including gravel, sand, clay, and silt). Since the county roads are not paved, when flash flooding occurs these areas need to be barricaded, and the location of the storm determines which areas require barricading. Typical road closures due to flooding occur on the following county roads: 429, 504, 427, 338, 581, 331, 579, 1216, 677, 668, 622, 618, 590, 696, 317, 850, 600, 597, 210, 466, 470, 825, 574, 578, 590, 638, 677, 483, and 484.

Hail can occur anywhere within the planning area; exposed populations, structures, and vehicles are most vulnerable. There are no building codes in place to mitigate the impact of hail on private property; however, there are new materials such as hail resistant shingles are available in the marketplace today.

High Winds The entire planning area and populations therein are vulnerable to high winds. Manufactured homes and exposed populations are most vulnerable to high winds. High winds can just as destructive, if not more destructive, than some tornados. They can also be harder to forecast and detect.

Lightning events can happen anywhere in the unincorporated areas of the county, but most strikes have occurred in areas with little vulnerability. Structures without dedicated lightning protection and exposed populations are most vulnerable.

Tornado Tornados can occur anywhere in the geographic planning area; residents in manufactured homes are most vulnerable.

Wildfire in Collin County is a moderate risk due to the well managed and readily available resources for response. While the entire unincorporated county may experience wildfire, they primarily occur roughly north of highway 380, in the unimproved areas of the county. Collin County contracts with city fire departments to respond to fires within the unincorporated county area, and during times of drought, burn bans, and high fire threat, automatic mutual aid between the cities is enacted. Structures, crops, and populations in the WUI are most vulnerable.

Winter Storms Winter storms have the potential to affect the entire planning area. Winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to storms and may be without basic services, such as water, data/communications and electricity, for an extended period of time. The homeless, elderly, and populations without heat being most vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of unincorporated Collin County geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in unincorporated Collin County as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, and the Collin County Emergency Management Coordinator.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, and the Collin County Emergency Management Coordinator.

The following tables provide a breakdown of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the Texas Association of Counties Population Estimates, the total population of Unincorporated Collin County in 2020 is 53,082 people, with 13,837 households as shown in *Table 3.4*.

Table 3.4 Unincorporated Collin County Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Unincorporated Collin County	53,082	4.86%	116.28	18,690	4.86%	40.94

Source: Texas Association of Counties Population Estimate & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for unincorporated Collin County).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Unincorporated Collin County	35,644	51,144	53,082	1,938	3.79%

Source: Texas Association of Counties Population Estimate

Property

There are an estimated 39,145 parcels in unincorporated Collin County, with an estimated $9,238,947,093 in total assessed value of improvements. *Table 3.6* lists the total number and percentage of parcels.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Unincorporated Collin County	39,145	7.54%	$9,238,947,093

Source: Collin County Appraisal District

[1]Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There are 2 identified emergency facilities in Unincorporated Collin County, including 2 fire stations, 0 police stations, 0 and hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Unincorporated Collin County	2	0	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are 80 critical facilities, which are considered non-emergency in unincorporated Collin County. The critical facilities include 3 schools and 77 historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Unincorporated Collin County	3	77

Source: Local jurisdictions

Critical Infrastructure

There are 147 identified critical infrastructure facilities in Collin County, including 1 airport, 6 natural gas facilities, 4 water treatment facilities, 16 wastewater treatment facilities, 88 dams, and 32 railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Unincorporated Collin County	1	6	5	17	88	32

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, Collin County's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, 5 using a statistical risk assessment methodology, and the remaining 3 hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X

Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to National Centers for Environmental Information (NCEI), property loss due to damage from drought is expected but unknown due to lack of accurate reporting. Available historical data indicates that the expected losses from drought correspond to unknown crop due to lack of accurate reporting, mostly experienced in water shortages and crop losses on agricultural lands.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), fatalities and injuries due to extreme heat are unknown due to lack of

Extreme Heat	
	accurate reporting. Unincorporated Collin County and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in unincorporated Collin County is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and emergency facilities in unincorporated Collin County are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in unincorporated Collin County are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in unincorporated Collin County

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero fatalities and injuries per year through the values may be inaccurate due to lack of reporting. Approximately 989 residential parcels in unincorporated Collin County are located within the 100-year floodplain.
Improved Property	Property loss due to flooding in unincorporated Collin County is expected but unknown due to lack of accurate reporting. Approximately $205,695,851 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events through the values may be inaccurate due to lack of accurate reporting. There are no personal losses expected from hailstorm events.

Hail	
Improved Property	According to National Centers for Environmental Information (NCEI), property loss in unincorporated Collin County due to hailstorm damage is expected but unknown due to lack of accurate reporting and all improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for unincorporated Collin County indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in unincorporated Collin County are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), fatalities and injuries from high wind events are unknown due to lack of accurate reporting. All the population of unincorporated Collin County are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses from high wind events in unincorporated Collin County is expected but unknown due to lack of accurate reporting. Unknown crop losses resulted from this hazard in unincorporated Collin County due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in unincorporated Collin County are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), fatalities and injuries from lightning events in unincorporated Collin County are expected but unknown due to lack of accurate reporting. All the population of unincorporated Collin County are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property or crop losses resulting from lightning in unincorporated Collin County is unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in unincorporated Collin County are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in unincorporated Collin County are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there is an unknown number of fatalities and injuries in unincorporated Collin County due to tornadoes however the values may be inaccurate due to lack of accurate reporting. All the population of unincorporated Collin County are exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses from tornadoes is expected but unknown due to lack of accurate reporting. Unknown crop losses resulted from this hazard in unincorporated Collin County, but values may be underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in unincorporated Collin County are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in unincorporated Collin County are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in unincorporated Collin County are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	According to National Centers for Environmental Information (NCEI), there is an unknown number of fatalities and injuries in unincorporated Collin County due to wildfires however the values may be inaccurate due to lack of accurate reporting. Based on geographical data, approximately 55.92% of unincorporated Collin County is vulnerable to wildfires.
Improved Property	Based on geographical data, property loss due to wildfires is expected but unknown due to lack of accurate reporting, which is an unknown percent of the overall property improvement values in unincorporated Collin County.
Emergency Facilities	Based on geographic information there are no fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are no bridges, no dams, no wastewater treatment facility, and no water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), fatalities and injuries from winter storms are expected but unknown due to lack of accurate reporting. All the population of unincorporated Collin County are exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses from winter storm events is expected but unknown due to lack of accurate reporting. Unknown crop losses are expected from this hazard in unincorporated Collin County due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in unincorporated Collin County are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in unincorporated Collin County are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in unincorporated Collin County are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, Collin County considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
Unincorporated Collin County	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	N	**57.1%**
Average % Yes Capabilities – 57.1%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers	% Yes
Unincorporated Collin County	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	**90%**
Average % Yes Capabilities – 61.5%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Unincorporated Collin County	N	Y	N	N	N	Y	N	N	N	N	**20%**
Average % Yes Capabilities – 20%											
Y- Yes N- No ?- Don't Know											

To quantify Collin County's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, unincorporated Collin County has 61.5% of identified legal and regulatory capabilities, 90% of identified administrative and technical capabilities, and 22.2% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Collin County	County Judge	The Commissioners Court, including the County Judge and County Commissioners, approve the county budget, approve Commissioners Court Orders and county policies, hire staff, approve plans, and determine the direction of the county overall. As the governing body, the ability to approve and regulate mitigation activities, expand and improve existing capabilities to better serve mitigation activities, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2011 and 2016 HazMAPs, the Collin County Hazard Mitigation Planning Team developed mitigation strategies for the Plan update. The goals are similar to the goals identified in Section 6.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Unincorporated Collin County.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. Priority rankings are classified as indicated in the table below. The STAPLEE was used for the 2016 Plan along with the 2021 Update.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

Unincorporated Collin County Action Items: Deferred from 2016 Plan

Collin County Action Item	Adopt and promote a comprehensive public education program that provides resources to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	Homeland Security
Implementation Schedule	1-3 years
Effect on Old Buildings	Depending on mitigation actions employed, can reduce the damage from multiple hazards to existing buildings.
Effect on New Buildings	Depending on mitigation actions implements, can reduce damages from multiple hazards to new buildings.
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This program will include discussion about mitigation projects for all identified hazards and what mitigation actions can be taken.
Status	Some work performed in this area using regional resources along with utilizing general fund dollars from Collin County.

Collin County Action Item	Develop and implement building codes to mitigate against structural damages caused by drought, high winds and tornado.
Hazard(s) Addressed	Drought, Tornado, High Winds
Goal/Objective	3-C

Priority	Low
Estimated Cost	$5,000
Potential Funding Sources	Local Funding
Lead Department	Collin County Engineering
Implementation Schedule	1-5 years
Effect on Old Buildings	If retrofitted, could mitigate damages to old buildings.
Effect on New Buildings	This action can reduce the effects of drought, tornadoes, and high winds on new buildings.
Cost Effectiveness	The cost of this project is low compared to the potential benefits of reducing the effects of drought.
Discussion	During times of drought, earth experiences significant changes that often impact structural foundations. Building codes can mitigate these effects through mandatory use of new technologies such as resource-efficient (low-flow) plumbing for drought and water conservation. Roof bracing requirements for new construction will mitigate damages from tornado and high Winds.
Status	Collin County utilizes adopted building codes.

Collin County Action Item	Expand water conservation measures to new developments and populations
Hazard(s) Addressed	Drought
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	May require low-flow retrofits and soil stabilization through landscaping for existing foundations to reduce effects of drought.
Effect on New Buildings	May require low-flow plumbing installations during construction, foundation protection through alternate landscaping to reduce effects of drought.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Work with local water suppliers and building developers to expand water conservation measures in new areas of development, to include reduced taps and drought resistant landscaping.
Status	Deferred, but rely heavily on local water districts to educate and implement needed programs. Additionally, added water systems have been brought online along with new systems being constructed as of 2021.

Collin County Action Item	Implement Community Tornado Safe Room Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C

Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Local Funds
Potential Matching Sources	Local Grants, Donations, In-Kind Match, Resident Match
Lead Department	Fire Marshal/Emergency Management
Implementation Schedule	1-5 years
Effect on Old Buildings	Existing building may be retrofitted for community safe room installation.
Effect on New Buildings	New buildings may include construction of safe rooms for the community.
Cost Effectiveness	Community and residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Local Community Tornado Safe Room Program in Identified Vulnerable Areas.
Status	Collin County residents were able to apply, and some received, grant funding through the North Central Texas Council of Government (NCTCOG) Saferoom Rebate Program. This program provided funding for saferooms through December 2020, when it was ended.

Collin County Action Item	Develop and Implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	Texas A&M Forest Service and USDA Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	2-3 years
Effect on Old Buildings	Can prevent serious damages to or loss of existing buildings due to wildfire.
Effect on New Buildings	Can prevent serious damages to or loss of new buildings due to wildfire.
Cost Effectiveness	CWPPs identify where wildfire mitigation efforts would be most effective.
Discussion	Identify wildland urban interface areas that would benefit from mitigation actions. Based on the individual variables of each area, actions such as fuel management, or defensible space development could be implemented.
Status	Deferred – no actions

Collin County Action Item	Implement Firewise mitigation programs in unincorporated Collin County.
Hazard(s) Addressed	Wildfire

Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	USDA and Texas A&M Forest Service Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	1-4 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	Cost low compared to potential loss of life and property to wildfire.
Discussion	Firewise communities experience fewer losses to wildfire than communities without the program.
Status	Deferred – no actions

Collin County Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources.
Effect on New Buildings	May entail enhanced construction materials.
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.
Status	Places identified during past event, however, additional resources need to be utilized to make this a viable option for residents

Collin County Action Item	Coordinate and complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management

Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones.
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones.
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – most dams are now under the jurisdictions of incorporated cities.

Collin County Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B, 2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes.
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes.
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – no action. Many of the earthquake threats in the region of slowed

Collin County Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.

Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – no action

Collin County Action Item	Distribute all-hazards NOAA Weather Radios to vulnerable populations.
Hazard(s) Addressed	3-C, 4-A, 4-B, 4-C
Goal/Objective	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Priority	Medium
Estimated Cost	$50,000 - $75,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	n/a
Effect on New Buildings	n/a
Cost Effectiveness	Cost of lives lost and injuries sustained is very high compared to cost of proactive mitigation.
Discussion	This project would lead to greater capabilities for vulnerable populations to take mitigation actions prior to and in the event of all hazards.
Status	Deferred – no action

Unincorporated Collin County Action Items: New

Collin County Action Item	Generators on or available for all critical infrastructure
Hazard(s) Addressed	Winter Weather, Tornado, Extreme Heat, Earthquake, Dam Failure, Flooding, Lightning, Hail, High Winds, Wildland Fire
Goal/Objective	2-B
Priority	High
Estimated Cost	$250,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	n/a
Effect on New Buildings	n/a
Cost Effectiveness	Cost of lives lost and injuries sustained is very high compared to cost of proactive mitigation.

Discussion	This project would help ensure all critical facilities do not lose power during events such as winter weather, tornados, or others in which we lose connection to the electrical grid

Collin County Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-3 years
Effect on Old Buildings	Depending on mitigation actions employed, can reduce the damage from multiple hazards to existing buildings.
Effect on New Buildings	Depending on mitigation actions implements, can reduce damages from multiple hazards to new buildings.
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

Collin County Action Item	Develop and implement building codes to mitigate against structural damages caused by drought, high winds, expansive soils and tornado.
Hazard(s) Addressed	Drought, Tornado, High Winds, Expansive Soils
Goal/Objective	3-C
Priority	Low
Estimated Cost	$5,000
Potential Funding Sources	Local Funding
Lead Department	Collin County Engineering
Implementation Schedule	1-5 years
Effect on Old Buildings	If retrofitted, could mitigate damages to old buildings.
Effect on New Buildings	This action can reduce the effects of drought, tornadoes, and high winds on new buildings.
Cost Effectiveness	The cost of this project is low compared to the potential benefits of reducing the effects of drought.
Discussion	During times of drought, earth experiences significant changes that often impact structural foundations. Building codes can mitigate these effects through mandatory use of new technologies such as resource-efficient (low-flow) plumbing for drought and water conservation. Roof

	bracing requirements for new construction will mitigate damages from tornado and high Winds.

Collin County Action Item	Expand water conservation measures to new developments and populations
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	May require low-flow retrofits and soil stabilization through landscaping for existing foundations to reduce effects of drought.
Effect on New Buildings	May require low-flow plumbing installations during construction, foundation protection through alternate landscaping to reduce effects of drought.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Work with local water suppliers and building developers to expand water conservation measures in new areas of development, to include reduced taps and drought resistant landscaping. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

Collin County Action Item	Implement Community Tornado Safe Room Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Local Funds
Potential Matching Sources	Local Grants, Donations, In-Kind Match, Resident Match
Lead Department	Fire Marshal/Emergency Management
Implementation Schedule	1-5 years
Effect on Old Buildings	Existing building may be retrofitted for community safe room installation.
Effect on New Buildings	New buildings may include construction of safe rooms for the community.
Cost Effectiveness	Community and residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Local Community Tornado Safe Room Program in Identified Vulnerable Areas.

Collin County Action Item	Develop and Implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	Texas A&M Forest Service and USDA Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	2-3 years
Effect on Old Buildings	Can prevent serious damages to or loss of existing buildings due to wildfire.
Effect on New Buildings	Can prevent serious damages to or loss of new buildings due to wildfire.
Cost Effectiveness	CWPPs identify where wildfire mitigation efforts would be most effective.
Discussion	Identify wildland urban interface areas that would benefit from mitigation actions. Based on the individual variables of each area, actions such as fuel management, or defensible space development could be implemented.

Collin County Action Item	Implement Firewise mitigation programs in unincorporated Collin County.
Hazard(s) Addressed	Wildfire
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	USDA and Texas A&M Forest Service Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Marshal
Implementation Schedule	1-4 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	Cost low compared to potential loss of life and property to wildfire.
Discussion	Firewise communities experience fewer losses to wildfire than communities without the program.

Collin County Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms

Goal/Objective	2-D
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources.
Effect on New Buildings	May entail enhanced construction materials.
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.

Collin County Action Item	Coordinate and complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones.
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones.
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

Collin County Action Item	Coordinate and complete flood impact maps that include possible depth and speed information
Hazard(s) Addressed	Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, TWDB
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management

Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in and out of flood zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in and out of flood zones
Cost Effectiveness	Low
Discussion	Flood data and maps are available for Collin County; however, data on potential flood water depths or water flow rates depending on rain fall amounts and/or intensity are not available. This data would help better identify potential areas that would benefit from mitigation action items.

Collin County Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B, 2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes.
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes.
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

Collin County Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.

Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Collin County Action Item	Distribute all-hazards NOAA Weather Radios to vulnerable populations.
Hazard(s) Addressed	3-C, 4-A, 4-B, 4-C
Goal/Objective	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Priority	Medium
Estimated Cost	$50,000 - $75,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	n/a
Effect on New Buildings	n/a
Cost Effectiveness	Cost of lives lost and injuries sustained is very high compared to cost of proactive mitigation.
Discussion	This project would lead to greater capabilities for vulnerable populations to take mitigation actions prior to and in the event of all hazards.

National Flood Insurance Program (NFIP) Compliance

Collin County participates in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480130#	COLLIN COUNTY*	COLLIN COUNTY	12/6/1977	3/16/1981	6/2/2009	6/16/1981	No

**: Unincorporated Collin County*

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Unincorporated Collin County	Director of Engineering	Taking action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	Collin County approved a Commissioners Court Order to deal with flooding issues in the county. The court order imposes stands for developing in flood-prone areas, including but not limited to, requiring construction materials be resistant to flooding, requiring "new construction or substantial improvements" to be designed to prevent water from entering or accumulating within electrical components, and requiring all new subdivision proposals have adequate storm water drainage plans.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with County's flood damage prevention order shall result in fines not more than $2000.00 for each violation, and in addition shall pay all costs and expenses involved in the case.

The Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. All CRS communities must maintain completed FEMA elevation and flood proofing certificates for all new and substantially improved construction in the Special Flood Hazard Area after the date of application for CRS classification.

Collin County will apply for and participate in the CRS program to provide discounted insurance premium incentives for communities to go beyond the minimum floodplain management requirements and to analyze and manage future development.

The following link provides information on jurisdictions that currently have CRS:
http://www.fema.gov/library/viewRecord.do?id=3629

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c) (4) (i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by Collin County Commissioners Court, and formal adoption of the plan by city council by each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Plan will be implemented by the county and participating jurisdictions as described throughout this document.

The Collin County Assistant Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning team, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Collin County will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning team will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Assistant Emergency Managers	Monitoring Plan: Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c) (4) (ii))*

2016 Plan Incorporation: The State of Texas Mitigation Plan, vulnerability assessments, and capabilities assessments were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT will establish a process in which the mitigation strategy, goals, objectives and actions

outlined in this plan will be incorporated into existing local planning strategies. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Unincorporated Collin County	County Commissioners	Budget	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Management Plan	Reviewed Annually, updated as needed	EMP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	County Commissioners	Capital Improvement Plan	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, County Commissioners, Water Districts	Drought Contingency Plan	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Collin County Hazard Mitigation Planning Team considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c) (4) (iii))

As stated in requirement § *201.6(c) (4) (iii)* the plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County.

The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex B: City of Allen

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan (HazMAP). This plan updates the Allen hazard mitigation plan submitted to FEMA as part of the 2016 Collin County plan. The City of Allen participated on the Collin County HazMAP Hazard Mitigation Planning Team (HMPT) for this update. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Allen. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

1. Introduction

The City of Allen is located at latitude 33°6'11"N and longitude 96°40'13"W. It sits in the southern region of Collin County with McKinney to its North and Plano to the South. Two (2) feeder creeks exist in Allen, Mustang Creek and West Rowlett Creek. There are four (4) main creek systems, Rowlett Creek, Cottonwood Creek, Watters Creek, and Russell Creek.

The City of Allen was named after Ebenezer Allen, a state politician and railroad promoter in 1872. Incorporated in 1953, Allen is home to the Allen Independent School District's new open-air sports facility Eagle Stadium as well as the city-owned and operated indoor arena, the Allen Event Center. Allen also hosts a satellite campus of Collin College, located inside Allen High School.



According to the North Central Texas Council of Governments (NCTCOG), the population of Allen is estimated to be about 105,623. The city has a total area of approximately 27.11 square miles of land area.

The City of Allen operates under a system of local government called Council/Manager, wherein all powers of the city are vested in the City Council.



Allen has a wide variety of local businesses and business development sites including Andrew's Distribution, Cabela's, Top Golf, Experian Information Solutions, Frontier Communications, and Cisco. Prominent in the local retail economy are The Village at Allen, Allen Premium Outlets, and Watters Creek at Montgomery Farm.

The city offers much in the way of recreational facilities and entertainment events which include the Allen Event Center which is home to the Allen Americans hockey team and the Dallas Sidekicks indoor soccer team; Celebration Park, which

hosts the annual pre-Fourth of July gala called the Allen USA Celebration; the Joe Farmer Recreation Center; the Don Rodenbaugh Natatorium; and Chase Oaks Golf Club.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Allen has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Allen officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c) (5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface
National Inventory of Dams	Dam information
City Ordinances	Structural and Safety designs

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Allen Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and the Collin County

HMPT. Allen planning committee representatives participated on the HMPT, with local efforts led by the City of Allen Emergency Management Coordinator.

The planning committee was assembled with representatives from the city, including the mayor, city manager, emergency management representatives, department heads, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. Table 2.2 provides a list of the primary representatives on the Allen planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City of Allen	Mayor	General Policy Guidance
City of Allen	City Manager	Policy Implementation
City of Allen	Emergency Management Coordinator	Supervise
Collin County	Asst. Emergency Management Coordinator	General Assistance

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Texas Health Presbyterian Hospital - Allen	Chief of Security/Risk Management	Review of plan
Texas Independent Insurance Group - Allen	Owner/Agent	Review of plan
Allen Board of Adjustment, Building and Standards Commission, and Sign Control Board	Citizen Board Member	Review of plan
Allen Independent School District (AISD)	Risk Manager	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included participation by all jurisdictions:

- Plan provided to the City of Allen on August 18, 2020
- Collin County Planning Meeting – November 5, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AMTBD

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and Allen planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign-in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The planning committee for the City of Allen identified several natural hazards and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3

35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Allen

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	0	3	0.9
Earthquake	0	0	0	0	0
Expansive Soils	1	0	0	1	0.4
Extreme Heat	2	1	0	3	1.25
Flooding	1	1	1	1	1
Hail	3	0	1	2	1.35
High Winds	2	1	1	2	1.4
Lightning	3	0	1	2	1.35
Tornado	1	2	2	2	1.7

Wildfire	0	0	0	0	0
Winter Storms	2	1	0	2	1.15

The conclusions drawn from the hazard profiling process for the City of Allen resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Allen.

Table 3.3 Hazard Rankings City of Allen

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado High Winds Hail Lightning Extreme Heat Winter Storms
Low Risk (PRI 0.50 – 1)	Flooding Drought
Negligible to No Risk (PRI 0 – 0.49)	Expansive Soils Dam Failure Earthquake Wildfire

Changes in Development and Priorities (Requirement §201.6(d) (3))

The City of Allen was a participating jurisdiction in the 2016 Collin County Hazard Mitigation Action Plan. Since then, the city has seen an increase in growth and commuter traffic and forecasts additions to single-family lots. Based on 2020 Census projections, the population of Allen increased from 98,344 to 105,623 during the time period 2015-2019. Housing units increased from 28,877 to 30,436, and related transportation routes and business structures also increased to accommodate the growing population. Travel lanes were added to US HWY-75 and widths of major roadways including Stacy Road, Bethany Road, Exchange Parkway, and Watters Road were increased. Overall growth is rated at 9%.

To minimize the damage caused by manmade and natural disasters, the City of Allen developed, implemented and enforces up-to-date building and fire codes and adopted a policy to prohibit development in FEMA identified flood plains. In addition, Allen has completed one of their original action items.

- Education and Awareness Projects
  - Develop and institute water conservation education program to mitigate and reduce the effects of extreme heat.

In 2011, the Fire Department added an additional fire station (Station 5) located on McDermott Road near the Custer Road intersection. The construction of Station 5 facilitated the addition of an early warning siren at the same location. The development and implementation of these mitigation projects have directly led to lower vulnerability for residents and property located in the City of Allen.

New priorities are noted and ranked in each new action item, Section 6. Except for actions completes or cancelled, other priorities remain the same as in the previous version of this plan.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Allen faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure The City of Allen is not perceived to be vulnerable to dam or levee failure on a large scale. One (1) dam was constructed within a small, residential neighborhood called The Preserve, located at the intersection of McDermott Drive and Shallowater Drive. The dam was constructed to preserve the original stock-pond impoundment, which dated back to the original farmstead use, as an amenity to the residents. Even though the impoundment is small, the dam has been registered with the Texas Commission on Environmental Quality, incurs routine inspection, and has an emergency action plan in-place for the structure.

Drought When defining drought as an occurrence in Texas it is best to consider two types of drought - *agricultural and hydrologic*. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a long term condition of abnormally dry weather that ultimately leads to the depletion of surface and ground water supplies, the drying up of rivers and streams and the cessation of spring flows. These two types of drought may, but do not necessarily, occur together. It should be noted that the severity of a drought cannot be completely measured in terms of precipitation alone, but precipitation statistics do provide an easily obtainable index of drought severity. Declining reservoir and stock tank levels due to a prolonged lack of precipitation are stark evidence of a severe drought. Texas experiences a cycle of extended wet and drought conditions that can extend over a period of months even years. Extended periods of drought can have an enormous impact on an area by affecting the abundance of water supply, the agriculture economy, and foundations of structures. All geographic areas of Allen have the potential to be vulnerable to drought.

An adequate supply of high quality water has become a critical issue for the future prosperity of Texas, where water is a limited resource. Due to increasing population, water demand is projected to exceed supply by 2030, based on current use rates. Protecting, managing and planning for the wise use of our water resources is an efficient and effective strategy to meet future water supply needs.

The City of Allen is a member city of the North Texas Municipal Water District (NTMWD). All of Allen's Water and Waste Water Treatment Services are provided by NTMWD, who is the regional wholesale supplier of potable water. More than 1.8 million people rely on this treated water. The raw water sources include Bonham Lake, Lavon Lake, Lake Texoma, Jim Chapman Lake (Cooper Lake), Lake Tawakoni, and the East Fork of the Trinity River southeast of Dallas.

The construction of a $306 million water transmission line from Lake Texoma to the water treatment plant at Wylie was completed and has begun delivery of water to the treatment plant in June 2014. It is estimated to be online in June 2014. Even with the return of the Lake Texoma water, it must be blended with Lake Lavon. Due to Lake Lavon's current level, Allen must continue water conservation efforts.

Stage 3 of the Water Conservation and Drought Contingency and Emergency Water Response Plan for the City of Allen, Texas and Ordinance Numbers 2760-8-08 and 3234-6-14 are currently in effect. A 10% reduction goal is required by NTMWD.
Restrictions caused by a drought affect local revenues significantly and can have major impacts on local industry, fire protection, and local agriculture. Allen's summer water consumption is 3.75 times our winter consumption due to increased landscape irrigation. This fact should make it apparent why the City of Allen restricts landscape irrigation as the primary way to achieve water use reductions as we continue Stage 3 conservation into the foreseeable future.

Drought has the potential to impact the entire planning area equally, all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of the city are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuing seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity. However, this hazard was identified as having negligible or no risk to the City of Allen.

Expansive Soils Soil conditions can have a significant effect on urban development as different soils can create various problems for structures and uses. Most soils have moderate to severe limitations for urban development as a result of shallow bedrock, high shrink-swell potential, and low strength. These problems must be recognized in construction to avoid foundation problems.

During months of prolonged high temperatures and drought, expansive soils may become more prevalent. Surface layers of soil can form sizable cracks as it expands and contracts over time, leading to structural foundation problems. Expansive soils are not a prevalent hazard within the City of Allen and were found to pose only a minor threat. Geographically, areas of Allen have the potential to be vulnerable to expansive soils. This hazard was identified as having negligible or no risk to the City of Allen.

Extreme Heat Extreme heat contributes to and may exacerbate drought conditions due to increased water use. Elevated heat indexes also affect asthma patients and the elderly when exposed. Working conditions outside are more difficult and heat stroke becomes a greater danger. Instances of heat stroke and death occur in vulnerable populations such as the homeless, elderly, and the very young if exposed to the high temperatures for an extended period of time. Electrical usage also spikes during the summer which can result in periods of grid blackout. Extreme heat has the potential to affect the entire planning area.

Allen's climate can be characterized as very humid and sub-tropical in the summer. It is usually very hot and dry with average maximum highs in the heart of summer reaching 96°F. However, the temperature frequently rises above 100°F. On average, Allen experiences 16 days per year where temperatures meet or exceed 100°F. Overnight lows usually stay in the lower to mid-70s, but sometimes they fail to fall below 80°F during extreme hot spells. Coupling these warm temperatures with high humidity creates what is called the heat index. The hottest temperature ever recorded, 113°F, occurred for two consecutive days on June 26th and 27th, 1980. Incidentally, that summer is the hottest summer on record with nearly forty (40) consecutive days of triple digit heat.

The City of Allen has the potential during heat emergencies to exceed the capabilities of the local hospital and Emergency Medical System. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding is the most prevalent and costly disaster in the United States. Floods have the ability to roll boulders the size of cars, uproot trees, and transport building. At the point the water concentration hyper extends the capacity of the flood way, the water enters the floodplain. Floods are most common in seasons of rain and thunderstorms. Floods can be associated with other natural phenomenon such as rainstorms, thunderstorms, hurricanes, earthquakes, and rapidly melting snow.

The City of Allen has a comprehensive flood program to go along with organized growth. The Allen Land Development Code (Ordinance # 2112-11-02) has dedicated one complete article to the aspect of flood control and several related sections on drainage.

The highlights of the city ordinance, with regards to flood control, are topics related to: what constitutes flood hazards, methods of reducing flood losses, flood plain administration, and risk reduction. The City of Allen has had an ordinance (since 1991) to evaluate development in terms of the "Ultimate 100-Year Flood". The term "Ultimate" indicates a model for fully developed conditions on the upstream portion of the watershed condition. The provision for flood related structures (bridges, culverts, drainage ditches, storm pipes etc.) designed for fully developed conditions and the requirement for the lowest floor of buildings to be a minimum of 18" above the base flood elevation in the case of commercial structures and 24" for residential structures have worked effectively to serve the city in heavy storms and floods.

The city has improved several structures that were inherited prior to the above referenced ordinance. Mustang Creek channel improvements in 2001, upstream of Main Street, has removed several houses from the flood plain. The rebuilding of McDermott Drive and the subsequent improvement of several drainage structures has prevented the road from flooding. Also, the project to replace the existing Exchange Parkway (Old Rowlett Road) Bridge with a new bridge made Exchange Parkway a safe conduit for traffic to cross Rowlett Creek. Overall, Allen has handled flood related issues with enough foresight to avoid major failures and significantly reduce hazards.

The City of Allen can be affected by two types of floods, though in limited areas. These include:

- Riverine Flood – Occurs in the floodplain of a river or stream when the amount of water and the rate at which the moving increases. This type generally can be forecast in advance, and proper precautions taken to save lives.
- Flash Flood – A type of Riverine flood that occurs after a heavy storm, when the ground cannot absorb the high amount of precipitation. This can occur when heavy precipitation falls on already-saturated soils. Flash Floods occur rapidly with little warning.

The city lies in the Blackland Prairies where the maximum elevation is 1000 feet and the minimum elevation is 450 feet. Allen is located in the Trinity River Basin where rainfall is between 30 to 40 inches per year, on average. Two (2) feeder creeks exist in Allen, Mustang Creek and West Rowlett Creek. There are four (4) main creek systems, Rowlett Creek, Cottonwood Creek, Watters Creek, and Russell Creek.

The City of Allen enjoys a relatively low susceptibility of flooding due to above average drainage and sewer systems as well as a robust infrastructure. Allen's most important measure to ensure that flooding does not become a life threatening hazard is to limit the use of flood prone areas. Other methods include the use of automatic roadblocks over roadways which are prone to seasonal flooding.

Hail Two conditions must be fulfilled for a thunderstorm to become a hail storm: (1) updraft velocities must be sufficiently strong enough to support hail storms during their growth; and, (2) liquid moisture must accumulate in a super-cooled state in the upper parts of the storm. Hail ranges in size from vanishing small particles to grapefruit dimensions. They may be spherical, conical or very irregular in shape.

The hail hazard is primarily in terms of damage of crops and property. Injury and loss of human life are rarely associated with hailstorms. Hail tends to fall in swaths that may be from 20 to 115 miles long and 5 to 30 miles wide. A hail swath is not a continuous path of hail but generally consists of a series of hail strikes, which are produced by individual thunderstorm cells traversing the same general area. Hail strikes are typically about 1/2 mile wide and 5 miles long. They may partially overlap, but often they leave completely undamaged areas between them. The amount of damage and destructive effects of a hailstorm is governed by size, number of hailstones, mass of ice, momentum, impact energy, and the dimensions of the hail swaths. Strong winds and heavy rains, which often accompany hail, will also add to the damage to crops and property.

Hail storms are most prevalent in the State of Texas in the north (where Allen is located) and western areas of the state. This can be contributed to the effects from large-scale weather systems that are evident in a broad band of maximum occurrence from New Mexico to Ohio. This is directly related to the area of greatest tornado activity known as "tornado alley". It is significant that hailstorm frequency is greatest during early spring and summer months. Hail during the three hottest months of the summer, however, is rare. All geographic areas of Allen are potentially susceptible to damaging hail. Damage in the City of Allen due to hail could result in a significant loss.

Insurance is the most widely used mitigation measure for property damage due to hail. It is not unusual for people in hail prone area to replace the roof covering of structures every three to five years due primarily to the use of cheaper, less hail resistant roof covering products. Windstorms and hail damage is the one single most costly loss suffered by Texans. Severe roof damage can be reduced by installing roofing products that are manufactures using heavy duty, quality materials that has the Underwriters

Laboratory (UL) 2218, hail resistant product listing. Exposed populations, manufactured homes, and older properties are most vulnerable to hail.

High Winds Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds have the potential to affect the entire planning area.

High winds are a frequent occurrence with severe thunderstorms and they can affect all areas of Allen. These winds can occur suddenly and without warning during severe weather and may pose access challenges due to fallen trees on roadways. There have been several instances of damage occurring to business and commercial structures as a result of high winds. Outside of primary residential structures, there are few locations for the public to seek shelter during high winds.

The City of Allen has typically experienced power outages, fires, and damage to roofs, cars, out buildings, and electrical utilities due to high winds. These events create significant planning and recovery issues.

Lightning damage results from four (4) effects of lightning strike: electrocution of humans and animals; vaporization of materials along the path of strike; fire caused by the high temperature produced by the strike; and a sudden power surge that can damage electrical and electronic utility substations and distribution lines. It is estimated that throughout the United States, a power outage caused by lightning occurs on 50 percent of the days throughout the year. Lightning has the potential to affect all populations and property in the City of Allen.

Although property damage is the major cost of the lightning hazard, it should be emphasized that lightning kills more people in the US each year than either tornadoes or hurricanes. On the average, six (6) people die from lightning strike every year in Texas. Allen has lost at least one (1) citizen due to electrocution from a lightning strike. Additionally, lightening is responsible for at least five (5) residential structure fires over the past two (2) years resulting in a total loss for each residence. Property without lightning protection and exposed populations are most vulnerable.

Tornado Tornadoes are directly associated with dark, heavy cumulonimbus (thunderstorm, squall line) clouds with intense lightning. The average tornado path is four (4) miles long but tornado tracks of more than 150 miles have been reported. The average width is 300 to 400 yards; however, some tornadoes cut swaths more than a mile wide. Precipitation usually occurs first as rain preceding the storm, frequently with hail and as a heavy down pour immediately to the left of the tornado's path.

While tornadoes in Texas can occur in any month and at all hours of the day or night, they occur with greatest frequency during the late spring and early summer months and during late afternoon and early evening hours.

Allen is in an area where the annual average tornado occurs 15 to 20 times per year. Special issues concerning a tornado incident within the City of Allen involve the large population of special needs residents within nursing homes and the many daycares and schools. An additional concern is the number of large trees in residential areas that could impact power lines and the restriction into areas needing assistance due to limbs blocking roadways.

The single most important factor influencing human response to tornado hazards is the adequate emergency warning system. Because a tornado is a very sudden event, a “short fused” type of disaster, there rarely is sufficient warning time. Police, Fire and Rescue, and volunteer storm spotters trained by the National Weather Service (NWS) SKYWARN tornado preparedness programs provide the initial step in adequate warning system.

The City of Allen incorporates the mentioned measures of early detection and utilizes the Emergency Operation Plan at the moment the NWS issues a tornado watch or warning. Additionally, sufficient insurance is the first order of mitigation to cover major losses of the home and belongings. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire Wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source. Wildland fires are fueled almost exclusively by natural vegetation. Typically, wildland fires occur in national forests and state parks where federal or state agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted. For the purposes of this hazard analysis, wildland fires are assessed under what is known as the Wildland Urban Interface (WUI). The WUI is an area of development that is susceptible to wildland fires due to the amount of structures located in an area with vegetation that can act a fuel for a wildland fire.

Due to the lack of fuel, there is negligible to no risk in Allen for a wildland fire. There have been no major wildland fires in the city for the past 10 years.

Winter Storms Winter storms in Allen can and have occurred with enough severity to be a threat to people and property. The types of winter storms that Allen is most familiar with are ice storms and cold waves. A snowfall with an accumulation of four (4) or more inches in a 12-hour period is considered a heavy snowfall. Although it has never been witnessed in Allen, blizzards are also possible, and can create a threat to the community.

An ice storm occurs when rain falls out of the warm and moist upper levels of the atmosphere into a cold and dry layer near the ground. The rain freezes on contact with the cold ground and accumulates on exposed surfaces. If a half-inch of rain freezes on trees and utility wires, damage can occur, especially if accompanied by high winds. Ice storm usually occurs from late December to mid-February. Winter storms have the potential to occur anywhere in the geographic planning area, with greatest vulnerabilities in highly populated or commercial areas.

Allen has experienced multiple severe ice storms over the past six (6) years. Loss of utilities, such as natural gas and electrical services has resulted from some of these storms. There have also been instances of structural damage to various roofs and car ports in Allen due to ice accumulation.

The passage of a winter cold front with a drastic drop in temperature heralds the arrival of a cold wave.

Blizzards are the most perilous of all winter storms, characterized by low temperatures and strong winds in excess of 35 MPH, bearing large amounts of blowing or drifting snow. True blizzards are rare in the Allen area; however, blizzard like conditions do exist during heavy snowstorms when gusty winds cause blowing and drifting snow.

The city has two (2) major highways (US 75 and SH 121) that may be impacted during winter storms. Areas impacted include local commerce, medical services, and local sheltering capabilities for potential stranded motorists.

Identification of Assets and Vulnerability Assessment

An inventory of Allen's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the US Census Bureau, the total population of Allen in 2020 was 105,823 people, with 30,436 households. The population breakdown is provided in *Table 3.4.*

Table 3.4 City of Allen Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
Allen	105,823	9.50%	3927.91	36,526	9.50%	1386.07

Source: US Census Bureau & Collin County Appraisal District
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population change absolute and percent predications for Allen).

Table 3.5 City of Allen Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Allen	84,246	87,980	90,030	2050	2.28%

Source: 2020 NCTCOG Population Estimates

Property

There are an estimated 37,282 thousand parcels in Allen, with an estimated $11,650,015,117 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Allen	37,282	7.48%	$11,650,015,117

Source: Collin County Appraisal District
[1]Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There are seven (7) identified emergency facilities in the City of Allen, including five (5) fire stations, one (1) police station, and two (2) hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 City of Allen Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Allen	5	1	2

Source: FEMA Resilience and Planning Tool

Critical Facilities

There are thirty two (32) critical facilities, which are considered non-emergency in Allen. The critical facilities include thirty one (31) schools and one (1) historical property site (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 City of Allen Critical Facilities

Jurisdiction	Schools	Historical Property
Allen	31	1

Source: FEMA Resilience and Planning Tool

Critical Infrastructure

There are eighty seven (87) identified critical infrastructure facilities in the City of Allen, including two (2) natural gas facilities, one (1) dam, three (3) railway bridges, forty four (44) highway bridges, and 37 city-owned vehicular bridges (*Table 3.9*). The rail system in Allen is owned by Dallas Area Rapid Transit (DART) and is not currently in use.

Table 3.9 City of Allen Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Allen	0	2	0	0	1	84

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, a City of Allen vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Allen, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		

Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerability Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Allen are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Allen. The City of Allen and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Allen is not vulnerable to this hazard.

Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Allen are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Allen are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in Allen.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year.
Improved Property	There have been two (2) recorded flood events in the City of Allen. Property losses are expected at $5,000 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded. Approximately $5,046,310,777 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure has the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected at $91,428.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data indicates that there are no expected crop losses from this event.

Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in Allen are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in Allen are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in Allen are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of Allen is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected at $1,900 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in Allen.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in Allen are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in Allen are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in Allen are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths and no injuries in Allen. All the population of Allen is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected at $4,375 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in Allen.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in Allen are vulnerable to this hazard.

Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in Allen are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in Allen are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in Allen. All the population of Allen is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), an average loss of $174,285.71 per year in property losses is expected to result from tornado events however these values are underestimated due to lack of accurate reporting. No crop losses are expected from this hazard in Allen.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in Allen are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in Allen are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in Allen are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown but unknown due to lack of accurate reporting;
Emergency Facilities	Based on geographic information there are no fire stations in Allen at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events in Allen.

Critical Infrastructure	Based on geographic information there are no bridges, no dams, no wastewater treatment facilities, and no water treatment facilities at risk from wildfire events in Allen.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Allen. All the population of Allen is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Allen.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in Allen are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in Allen are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in Allen are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Allen considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
Allen	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	**71 %**
Average % Yes Capabilities – 71%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes per Jurisdiction
Allen	Y	Y	Y	Y	N	Y	Y	N	Y	Y	**80%**
Average % Yes Capabilities – 80%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
Allen	Y	Y	N	Y	Y	Y	N	N	N	N	**50%**
Average % Yes Capabilities – 50%											
Y- Yes N- No ?- Don't Know											

To quantify City of Allen's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the City of Allen has 71% of identified legal and regulatory capabilities, 80% of identified administrative and technical capabilities, and 50% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Allen	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement, expand, and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2021 HazMAP, the City of Allen Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Allen.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Allen Action Items: Deferred from 2016 Plan

City of Allen Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other hazards and civil emergencies.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Develop and establish extreme temperature plan including cooling and heating shelters for vulnerable residents.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management, CERT
Implementation Schedule	1-2 years
Effect on Old Buildings	May require retrofit to accommodate new designs, resources needed
Effect on New Buildings	Will make new buildings safer for vulnerable populations
Cost Effectiveness	Cost to implement this program is low compared to the benefits of reduced injury and death related to extreme temperature.
Discussion	Developing an extreme temperature program that identifies both public and private safe locations for vulnerable residents to go during periods of extreme temperatures would reduce levels of injury and death in this segment of the population.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Adopt and promote a comprehensive public education program, including information about mitigation projects.
Hazard(s) Addressed	Extreme Heat, High Wind, Wildfire, Tornado, Drought, Winter Storms, Flooding, Hail, Expansive Soils, Dam Failure, Earthquake
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Emergency Management, CERT
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is an extremely effective low cost method.

Discussion	Adopt and promote a comprehensive public education program based on the hazards identified in this annex, including information on mitigation projects.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Allen Action Item	Expand outdoor warning sirens to cover new populations
Hazard(s) Addressed	Hail, High Wind, Tornado , Dam Failure, Lightning
Goal/Objective	1-B
Priority	Medium
Estimated Cost	$35,000 each
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	May require siren tower construction on existing buildings
Effect on New Buildings	None
Cost Effectiveness	Cost of implementation is low compared to the benefits of reduced injury and death related to tornados.
Discussion	Replacement of old or damaged warning sirens and expanding coverage to new populations is a proactive approach to mitigating the effects of severe weather and prevent loss of life by providing advanced warning to citizens.
Status	Added 9 additional sirens since last report, all are operational Cancelled – No longer a viable action item

City of Allen Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years

Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for earthquake damage
Effect on New Buildings	Study would identify existing construction most at risk for earthquake damage
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Cancelled – No longer a viable action item

City of Allen Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants

Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Cancelled – No longer a viable action item

Allen Action Item	Improve construction standards and techniques through requiring, by ordinance, builders to utilize water saving plumbing and fixtures in new construction.
Hazard(s) Addressed	Drought
Goal/Objective	2-C
Priority	High
Estimated Cost	$2,000-3,000
Potential Funding Sources	Local budget, Builders.
Lead Department	Building Department
Implementation Schedule	1-5 years
Effect on Old Buildings	No effect unless retrofitted
Effect on New Buildings	Reduced water consumption
Cost Effectiveness	Cost is very low compared to water shortages.
Discussion	This project would require low-flow plumbing and fixtures in all new construction, mitigating the effects of drought.
Status	Cancelled – No longer a viable action item

City of Allen Action Items: New

City of Allen Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B
Priority	Medium

Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Emergency Management, CERT
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Allen Action Item	Purchase and utilize mobile back-up generator
Hazard(s) Addressed	Flooding, Tornado, Earthquake, Extreme Heat, Lightning, Wildfire, Winter Storms, Hail, High Winds
Goal/Objective	2-D
Priority	High
Estimated Cost	$5,000 - $10,000
Potential Funding Sources	Local Funding
Potential Matching Sources	Local Funding
Lead Department	Public Works, OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofit with ability to connect with generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to generator
Cost Effectiveness	Backup generator will prevent loss of power and data to critical government buildings
Discussion	Introduction of a mobile back-up generator will allow the City of Celina or other critical facilities to function as close to normal as possible in the event of a massive power loss.

City of Allen Action Item	Develop and implement a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000

Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Allen Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

City of Allen Action Item	Analyze needs, develop and implement water conservation measures for new populations
Hazard(s) Addressed	Drought, Expansive Soils

Goal/Objective	2-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM
Implementation Schedule	2-3 years
Effect on Old Buildings	New constraints will be placed on water usage without compromising soil integrity.
Effect on New Buildings	New constraints will be placed on water usage without compromising soil integrity.
Cost Effectiveness	Expanded water and soil consistency standards will help the city of Celina plan for a boost in infrastructure and population and help maintain normal water levels
Discussion	As the City of Allen grows water conservation measures will encompass new infrastructure and residential/commercial areas. This plan implements conservation efforts that also maintain soil consistency, mitigating damage from expansive soils.

City of Allen Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Allen Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

National Flood Insurance Program (NFIP) Compliance

Allen is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480131#	ALLEN, CITY OF	COLLIN COUNTY	12/20/1974	6/1/1978	6/2/2009	6/1/1978	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Allen	Program Manager	Adopt comprehensive regulations pertaining to the development and maintenance of the floodplain within city limits.	City Council adoption and amendment of Article V of the Allen Land Development Code (ALDC).	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500 per violation plus court costs.

The City of Allen is a participant in the National Flood Insurance Program (NFIP) and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities. The City has an article in the Allen Land Development Code (ALDC), adopted by ordinance, dedicated exclusively to floodplain management and development regulations. The community philosophy has been to identify and preserve floodplain areas when development occurs in close proximity to watercourses and creeks. The regulations require the floodplain areas to remain in a natural state and avoid encroachment without offsetting mitigation. Allen is a freeboard community, requiring 2-feet of elevation difference between residential structures (1.5-feet for commercial uses) and the fully-developed 100-year water surface elevation. As a result of these conservative standards, the City of Allen has been able to keep flood insurance policies within our community to a very low number.

Article V – "Special Zones" of the ALDC was most recently updated in September of 2014.

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c) (4) (i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Allen, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning team, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Allen will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning team and committees will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented in table 7.1:

Table 7.1 Plan Maintenance Timeline

Personnel	What	Time
Emergency Management Coordinator	Monitoring Plan: Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c) (4) (ii))*

2020 Plan Incorporation: The Allen City Council adopts a rolling five-year capital improvement plan each and every year, subsequent to a recommendation from the Planning & Zoning Commission. Bank stabilization at two locations has occurred to mitigate the effects of erosion along publicly maintained creeks and waterways. This past calendar year, the Engineering Department administered bank stabilization projects for: The Old Stone Dam (along Cottonwood Creek, upstream of Exchange Parkway) and The Cottonwood Trail (Cottonwood Creek, upstream of Bethany). The Old Stone Dam Project ($500,000 approx.) was to preserve and stabilize banks on either side of a historic dam constructed in 1874. The Cottonwood Trail Project ($800,000 approx.) was implemented to preserve an existing hike and bike trail, and avoid further risk to a neighboring residential structure. The residential structure was not in the regulatory floodplain, but the edge of the bank had come within 10 feet of the backyard fence. NFIP language in Article V was also updated (2014), stricter water conservation plans have been instituted, and building codes were update to the 2009 International Building Code.

2021 Plan Incorporation: The State of Texas Hazard Mitigation Plan, vulnerability assessments, and capabilities assessments for each jurisdiction were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into existing local planning strategies and mechanisms, as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Allen	City Council	Budget	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan	Every five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council	Capital Improvement Plan	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency Plan	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
	Planning Director, City Council	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the City of Allen Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c) (4) (iii))

As stated in requirement § *201.6(c) (4) (iii)* the plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

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Annex C: The City of Anna

1. Introduction

This annex was prepared in 2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Anna participated on the Collin County HazMAP Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the City of Anna. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Anna. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Anna has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped City officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and Demographics
Regional Hazard Assessment Tool	Hazard Occurrences
National Climatic Data Center (NCDC)	Hazard Occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface

National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Anna Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and the Collin County HMPT. An Anna planning committee representative participated on the county HMPT, with local committee efforts led by the fire chief.

The planning committee was assembled with several representatives including the Anna city manager; police chief; fire chief; finance, public works and planning directors; and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. Table 2.2 provides a list of the primary representatives on the Anna planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Fire Department	Fire Chief/EMC	Plan Development
Planning Department	Planning Director	Plan Development
Finance Department	Finance Director	Plan Development
Public Works Department	Public Works Director/Floodplain Manager	Plan Development
Police Department	Police Chief	Plan Development
City Management	City Manager	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions, including the unincorporated areas of Collin County, by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the cities and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.

- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Anna Independent School District	Executive Director	Review of plan
American Medical Response	Collin County Supervisor	Review of plan
Atmos Energy	District Representative	Review of plan
TXU Energy	District Representative	Review of plan
Grayson-Collin Electric Cooperative	Area Representative	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each jurisdiction above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County HazMAP Planning Meeting – Week of 11/05/2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The planning committee for the City of Anna identified several natural hazards and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Anna

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	1	1	2	1	1.25
Drought	3	0	1	3	1.45
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	0	0.65
Hail	2	0	0	1	0.7
High Winds	2	1	1	1	1.3
Lightning	1	0	1	0	0.55
Tornado	2	1	2	1	1.55
Wildfire	1	1	1	1	1
Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for the City of Anna resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Anna.

Table 3.3 Hazard Rankings for the City of Anna

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Drought High Winds Winter Storms Dam Failure
Low Risk (PRI 0.50 – 1)	Extreme Heat Expansive Soils Hail Flooding Lightning Wildfire
Negligible to No Risk (PRI 0 – 0.49)	Earthquake

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability The City of Anna faces with each hazard. The hazards identified in the main plan are all addressed in this annex; therefore, the natural hazards rated negligible to no risk are included, described, and considered for mitigation in this plan.

Dam and Levee Failure While there are no dams or levees in the City of Anna, there are dams near the city in unincorporated Collin County. Population and infrastructure would be negatively affected by dam failure. As a participant in the county plan inundation studies will be considered.

Drought Although droughts happen often in the City of Anna their impact has been negligible, the risk is considered to be moderate. Drought has the potential to impact the entire planning area equally, all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of the city are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork, Woodbine Aquifer and the Trinity Aquifer are water sources for the City of Anna and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Even though earthquakes were identified as having negligible to no risk to the City of Anna they still have the potential to occur anywhere in the geographic planning area. Therefore, all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils The City of Anna is vulnerable to this hazard; however, its impact on infrastructure is projected to be minor. All property has the potential to be affected by expansive soils, especially those constructed under older building codes.

Extreme Heat The City of Anna has experienced rolling blackouts due to extreme heat through the years. Extreme heat generally affects the entire population, but it is especially dangerous to the homeless, elderly, the very young, those without air conditioning, and those who require refrigerated medications.

Flooding When flash flooding occurs, roads in low lying areas need to be closed. The location of the storm determines which areas require closure however, typical road closures due to flooding occur on Rosamond and Victoria Falls.

Hail All geographic areas, property, and populations of the City of Anna have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds All geographic areas, property, and populations of the City of Anna have the potential to be vulnerable to high winds, manufactured homes and exposed populations are most vulnerable.

Lightning The City of Anna has experienced lightning strikes in the past, including one that damaged electrical equipment in the fire station. All property and populations have are potentially vulnerable to lightning. Exposed populations and property without lightning protection are most vulnerable.

Tornado All geographic areas and populations of the City of Anna have the potential to be vulnerable to tornados. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire 39.81% of the City of Anna's population lives in the Wildland Urban Interface, but wildfire in the City of Anna is a moderate vulnerability due to the well managed and readily available resources for response. According to the Texas A&M Forest Service the majority of the WUI is in the low threat area location in the middle of the city and the east and west sides of the city are in the moderate threat area.

Winter Storms All geographic areas of the City of Anna have the potential to be vulnerable to winter storms. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time.

Identification of Assets and Vulnerability Assessment

An inventory of the City of Anna's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Predictions, the total population of City of Anna in 2020 was 16,945 people, with 5,770 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Anna	16,945	1.44%	983.05	5,555	1.44%	346.15

Source: US Census Bureau & Collin County Appraisal District
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Anna).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Anna	8,249	13,690	15,010	1,320	9.6%

Source: 2020 NCTCOG Population Predictions

Property

There are an estimated 8,030 parcels in the City of Anna, with an estimated $1,147,264,604 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Anna	8,030	0.94%	$1,147,264,604

Source: Collin County Appraisal District

Emergency Facilities

There are two identified emergency facilities in the City of Anna, including one fire station, one police station, and one free standing ER facility, but no hospitals]. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Anna	1	1	0

Source: City Data

Critical Facilities

There are six critical facilities, which are considered non-emergency in the City of Anna. The critical facilities include five schools and one historical property site (*Table 3.8*).

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Anna	5	1

Source: City and County Data

Critical Infrastructure

There are 10 identified critical infrastructure facilities in the City of Anna, including one natural gas facility, one water treatment facility, one wastewater treatment facilities, and three railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Anna	0	1	1	5	0	3

Source: City/County Data

Methodology

Based on the type of information available for analysis, Collin County's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		

Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Anna are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Anna are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Anna. The City of Anna and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Anna is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the emergency facilities in the City of Anna are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Anna are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Anna.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 147, based on parcels within or that intersect the floodplain.
Improved Property	Though there have been two (2) recorded flood events in the City of Anna, property losses are expected but financially unknown due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately 34 parcels with an estimated 2020 value of $6,549,778 are located in the 100-year flood plain. In addition, 271 parcels, with a value of $63,346,653 are within or in some way intersect the 100 year floodplain.
Emergency Facilities	Emergency facilities do not have the potential to be as risk in the 100-year storm event.
Critical Facilities	One critical facility has the potential to be at risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to National Centers for Environmental Information (NCEI), a loss of $285.71 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for City of Anna indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in City of Anna are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in City of Anna are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in City of Anna are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Climatic Data Center (NCDC), there are two (2) recorded fatalities and no recorded injuries from high wind events. All the population of City of Anna are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Anna are expected at $1,421.43 per year however these values are underestimated due to lack of

	accurate reporting. No crop losses resulted from this hazard in City of Anna.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in City of Anna are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in City of Anna are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in City of Anna are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths and no injuries in Collin County. All the population of City of Anna is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Anna are expected at $2,083.33 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in City of Anna.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in City of Anna are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in City of Anna are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in City of Anna are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been 6 recorded injuries and 2 fatalities from tornado events in the City of Anna. All the population of City of Anna is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), an average loss of $14,714.29 per year in property losses is expected to result from tornado events however these values are underestimated due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Anna.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Anna are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Anna are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Anna are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 39.81% of the City of Anna is vulnerable to wildfires
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Anna are also unknown.
Emergency Facilities	Based on geographic information there are zero (0) fire stations at risk from wildfire events.

Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are zero (0) bridges, zero (0) dams, zero (0) wastewater treatment facility, and zero (0) water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Anna. All the population of the City of Anna are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Anna are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Anna.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in City of Anna are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in City of Anna are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in City of Anna are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Anna considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
City of Anna	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	?	**100%**
Average % Yes Capabilities – 100%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers	% Yes per Jurisdiction
City of Anna	Y	Y	Y	Y	N	Y	Y	N	Y	N	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
City of Anna	Y	Y	Y	Y	Y	Y	Y	N	N	?	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify the City of Anna's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the city of Anna has 100% of identified legal and regulatory capabilities, 70% of identified administrative and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.2 Administrative and Technical Capability Summary

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
The City of Anna	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the Ability to implement, approve, and expand mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Anna Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. Priority rankings are classified as indicated in the table below. The STAPLEE was used for the 2016 Plan along with the 2021 Update.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Anna Action Items: Deferred from 2016 Plan

City of Anna Action Item	Develop and implement a comprehensive public education program, including hazard mitigation activities.
Hazard(s) Addressed	Dam Failure, Drought, High Winds, Tornado, Wildfire, Winter Storm, Expansive Soil, Extreme Heat, Hail, Lightning, Flooding, Earthquake
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions.
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages.
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Anna identified as being vulnerable to. The program would use a combination of distributed literature, social media, and civic presentations to educate residents on natural hazards and promote hazard mitigation.

Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

City of Anna Action Item	Establish centers for vulnerable residents to go for relief during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate space and resources.
Effect on New Buildings	May entail enhanced construction materials.
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling and heating shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Enhance safety of existing residential structures.
Effect on New Buildings	Enhance safety of new residential structures.
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Anna Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren, number of sirens TBD
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1—2 years
Effect on Old Buildings	May entail adding a siren tower to existing buildings.
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand the City of Anna's siren coverage to new areas of development not currently protect by sirens.
Status	Cost prohibitive at this time and requires significant maintenance. Not as an effective tool to notify the public as in the past. There are many other tools that are more effective today.

City of Anna Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones.
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones.
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	The City no longer has plans to undertake this action item.

City of Anna Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000

Potential Funding Sources	TFS Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan. This will be included in the upcoming Community Risk Assessment study.

City of Anna Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results may entail retrofits for low-flow plumbing.
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundations.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Plan developed and will be continued to be modified updated to meet the City's needs

City of Anna Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years

Effect on Old Buildings	Results could define required retrofits or additions to reduce vulnerability to earthquakes.
Effect on New Buildings	Results could require updated codes for new construction to reduce vulnerability to earthquakes.
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	No longer a needed action item.

City of Anna Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Anna Action Item	Purchase and distribute NOAA Weather Radios to vulnerable residents.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on any mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages.
Effect on New Buildings	Depending on any mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages.

Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information.
Status	No longer a viable option, use Hyper-Reach to notify the community

City of Anna Action Items: New

City of Anna Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken, can make existing building safer, stronger and less vulnerable to damages through retrofits and other actions.
Effect on New Buildings	Depending on mitigation actions taken, can make new building safer, stronger and less vulnerable to damages.
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Anna Action Item	Establish centers for vulnerable residents to go for relief during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate space and resources.
Effect on New Buildings	May entail enhanced construction materials.

Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling and heating shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.

City of Anna Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Enhance safety of existing residential structures.
Effect on New Buildings	Enhance safety of new residential structures.
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.

City of Anna Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.

City of Anna Action Item	Maintain and enhance the City's drought contingency plan.

Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results may entail retrofits for low-flow plumbing.
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundations.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Utilize existing plan for conserving water based on the stages of drought. Plan includes strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Anna Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Anna Action Item	Purchase and utilize mobile back-up generator
Hazard(s) Addressed	Flooding, Tornado, Earthquake, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds
Goal/Objective	2-D
Priority	High

Estimated Cost	$8,000 - $15,000
Potential Funding Sources	Local Funding
Potential Matching Sources	Local Funding
Lead Department	Public Works, OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofit with ability to connect with generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to generator
Cost Effectiveness	Backup generator will prevent loss of power and data to critical government buildings
Discussion	Introduction of a mobile back-up generator will allow the City of Anna or other critical facilities to function as close to normal as possible in the event of a massive power loss.

City of Anna Action Item	Analyze needs, develop and implement water conservation measures for new populations
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	High
Estimated Cost	$2,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM
Implementation Schedule	2-3 years
Effect on Old Buildings	New constraints will be placed on water usage without compromising soil integrity.
Effect on New Buildings	New constraints will be placed on water usage without compromising soil integrity.
Cost Effectiveness	Expanded water and soil consistency standards will help the City of Anna plan for a boost in infrastructure and population and help maintain normal water levels
Discussion	As the City of Anna grows, water conservation measures will encompass new infrastructure and residential/commercial areas. This plan implements conservation efforts that also maintain soil consistency, mitigating damage from expansive soils.

National Flood Insurance Program (NFIP) Compliance

The City of Anna participates in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 Anna NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480132#	ANNA, CITY OF	COLLIN COUNTY	8/9/1974	4/2/1991	06/02/09(M)	11/19/1996	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

Jurisdiction Actions

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 Anna NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
The City of Anna	City Engineer	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits shall be presented to the Floodplain Administrator. The City of Anna requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval.
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	City of Anna participates in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	
		Future Mitigation Projects	City of Anna will continue to monitor for new areas of flooding that have not been previously identified for mitigation. The City is also considering the adoption of a stormwater utility to fund future mitigation projects.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the City of Anna has developed a plan maintenance process which is described in the following paragraphs. Collin County and the participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Anna, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Anna will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented in table 7.1:

Table 7.1 Plan Maintenance Timeline

Personnel	Action	Time
Fire Chief/EMC	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when

developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.
Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Anna	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan updates	Every five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	Planning Director, City Manager	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the City of Anna Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

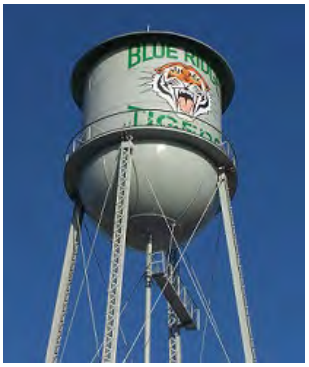
Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful

implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex D: City of Blue Ridge



1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan (HazMAP). The City of Blue Ridge participated on the Collin County HazMAP Planning Team (HMPT). In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Blue Ridge. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Blue Ridge has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Blue Ridge officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), the City of Blue Ridge developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data were gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences

Source	Data
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Blue Ridge Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT. The efforts of the planning committee were led by the Mayor.

The Collin County HMPT was assembled in November 2020 with representatives from participating county jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. Table 2.2 provides a list of the primary representative on the Blue Ridge planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City Council	Mayor	Plan Development
City Council	Council Members	Plan Development
Volunteer Department	Fire Chief	Plan Development
Public Works Department	Director	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.

- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Blue Ridge Independent School District	School Board	Review of plan
Atmos Energy	Manager of Public Affairs	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were hosted by Collin County:

- Collin County Hazard Mitigation Committee Meeting – November 11, 2020
- Collin County and Blue Ridge Meeting – November 12, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and local planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Blue Ridge identified several natural hazards and man-made hazards that could affect the unincorporated areas of the County. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 Collin County HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the City of Blue Ridge and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3

35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Blue Ridge

The conclusions drawn from the hazard profiling process for the City of Blue Ridge resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Blue Ridge.

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	3	1	1	2	1.7
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	3	1	0	0	1.25

Flooding	2	1	1	1	1.3
Hail	2	0	0	1	0.7
High Winds	3	1	2	2	1.95
Lightning	2	0	1	0	0.85
Tornado	2	3	3	2	2.6
Wildfire	3	1	2	1	1.85
Winter Storms	1	2	3	2	1.95

Table 3.3 Hazard Rankings for the City of Blue Ridge

High Risk (PRI 2 - 3)	Tornado
Moderate Risk (PRI 1.01 -1.95)	High Winds Winter Storm Wildfire Drought Flooding Extreme Heat
Low Risk (PRI 0.50 – 1)	Lightning Hail Expansive Soil
Negligible to No Risk (PRI 0 – 0.49)	Dam Failure Earthquake

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Blue Ridge faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure The City of Blue Ridge is not subject to dam failure because no Dams are located inside the city limits. The city is not knowingly vulnerable to a Dam failure that occurs outside the city limits, but as a participant in the county plan inundation studies will be considered.

Drought Drought has the potential to impact the entire planning area equally, all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of the City of Blue Ridge are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. The Woodbine Aquifer is the water sources for the city and is vulnerable to drought. In turn, the city's

population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake All geographic areas of Blue Ridge have the potential to be vulnerable to earthquake. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils The City of Blue Ridge is vulnerable to of expansive soil. All property has the potential to be vulnerable to expansive soils, especially those constructed under older building codes. Road failures are also a common occurrence from this hazard.

Extreme Heat We have experienced rolling blackouts due to extreme heat through the years. Extreme heat generally affects the entire population, but it is especially dangerous to the homeless, elderly, the very young, those without air conditioning, and those who require refrigerated medications

Flooding The intersection of North Church Street and School Street frequently floods during periods of heavy rainfall and must be closed.

Hail All geographic areas of Blue Ridge have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Because Blue Ridge is located in a rural area with many trees, high winds have the potential to block roads, disrupt power, and damage homes.

Lightning All geographic areas, property, and populations in Josephine have the potential to be vulnerable to lightning. Lightning is responsible for at least one (1) residential structure fire over the past ten (10) years resulting in a total loss for the residence. Property without lightning protection and exposed populations are most vulnerable.

Tornado All geographic areas of Blue Ridge have the potential to be vulnerable to tornado. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire According to the Texas Forest Service, 89.22% of the population of the City of Blue Ridge is located in the Wildland/Urban Interface. The City of Blue Ridge is predominately rural with a significant amount of wildland-urban area interface. Due to large fuel loads, there is significant risk in Blue Ridge for a wildland fire. There have been two wildland fires in the city in the last year; therefore, this hazard has the potential to harm the City of Blue Ridge.

Winter Storms Winter storms pose a threat to the City of Blue Ridge. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. The entire city is vulnerable to this hazard mainly due to its isolation from a major city.

Identification of Assets and Vulnerability Assessment

An inventory of Collin County geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the Texas Association of Counties Population Estimates, the total estimated population of Blue Ridge in 2020 was 1023 people, with 360 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
Blue Ridge	1023	0.09%	612.57	360	0.09%	215.70

Source: Texas Association of Counties Population Estimates & Collin County Appraisal District

***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Blue Ridge).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Blue Ridge	799	916	926	10	1.1%

Source: Texas Association of Counties Population Estimates
-: Data Currently Unavailable

Property

There are an estimated 598 parcels in the City of Blue Ridge, with an estimated $51,331,247 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Blue Ridge	598	0.19%	$51,331,247

Source: Collin County Appraisal District
[1] Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There is one identified emergency facility in the City of Blue Ridge, including one fire station. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Blue Ridge	1	0	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are 5 critical facilities, which are considered non-emergency in the City of Blue Ridge. The critical facilities include three schools and zero historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Blue Ridge	3	0

Source: Local jurisdictions

Critical Infrastructure

There are 2 identified critical infrastructure facilities in the City of Blue Ridge, including one wastewater treatment facility and one potable water treatment facility (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Blue Ridge	0	0	1	1	0	0

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, The City of Blue Ridge's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events in the City of Blue Ridge. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Blue Ridge are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Blue Ridge are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Blue Ridge. The City of Blue Ridge and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Blue Ridge is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Blue Ridge are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Blue Ridge are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Blue Ridge

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 18 residential parcels in the City of Blue Ridge are located within the 100-year floodplain.
Improved Property	Though there have been zero (0) recorded flood events in the City of Blue Ridge, property losses are unknown due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $539,608 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	0% of railways/highways and bridges, 0% of dams, 100% of water treatment works, and 100% waste water treatment facilities are at risk from the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events in the City of Blue Ridge. There are no personal losses expected from hailstorm events.
Improved Property	According to National Centers for Environmental Information (NCEI), a loss of $228.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard in the City of Blue Ridge. Although some crops are susceptible to hail hazards, available historical data for the City of Blue Ridge indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Blue Ridge are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events the City of Blue Ridge. All the population of the City of Blue Ridge is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Blue Ridge are expected at $42.86 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Blue Ridge.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Blue Ridge are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in the City of Blue Ridge. All the population of the City of Blue Ridge is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Blue Ridge are expected at $833.33 per year however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Blue Ridge are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Blue Ridge are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Blue Ridge. All the population of the City of Blue Ridge is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Blue Ridge are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Blue Ridge.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Blue Ridge are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Blue Ridge are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Blue Ridge are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 89.22% of the City of Blue Ridge is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Blue Ridge are also unknown.
Emergency Facilities	Based on geographic information 1 fire stations at moderate risk from wildfire events.
Critical Facilities	Based on geographic information 5 schools at moderate risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 1 wastewater treatment facility, and 0 water treatment facility at moderate risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Blue Ridge. All the population of The City of Blue Ridge are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Blue Ridge are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Blue Ridge.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Blue Ridge are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Blue Ridge are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Blue Ridge are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Blue Ridge considered not only its level of hazard risk but also the existing capability to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
City of Blue Ridge	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	N	N	N	**57%**
Average % Yes Capabilities – 57%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers (used as needed – not on staff)	% Yes
City of Blue Ridge	Y	Y	Y	N	N	Y	Y	N	N	Y	**60%**
Average % Yes Capabilities – 60%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
City of Blue Ridge	Y	N	Y	Y	Y	Y	N	N	N	N	**50%**
Average % Yes Capabilities – 50%											
Y- Yes N- No ?- Don't Know											

To quantify City of Blue Ridge legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and

strong (70-100%). Questionnaire responses indicated that on average, the city of Blue Ridge has 50% of identified legal and regulatory capabilities, 50% of identified administrative and technical capabilities, and 10% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Blue Ridge	City Secretary	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Blue Ridge Hazard Mitigation Planning Committee developed mitigation strategies for the Plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within City of Blue Ridge.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. Priority rankings are classified as indicated in the table below. The STAPLEE was used for the 2016 Plan along with the 2021 Update.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Blue Ridge Action Items: Deferred from 2016 Plan

City of Blue Ridge Action Item	Develop and implement a comprehensive public education program, including resources to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, High Winds, Winter Storm, Wildfire, Drought, Hail, Flooding, Lightning, Extreme Heat, Expansive Soils, Dam Failure, Earthquake
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Develop and distribute, via social media, information about mitigating the hazards identified and what actions can be taken in this annex
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Blue Ridge Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Winds, Tornado, Hail
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofits
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Blue Ridge Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	The City of Blue Ridge will expand its current siren program into newly developed areas of the jurisdiction that are currently outside of siren coverage.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire and implement mitigation actions to reduce vulnerability.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Develop and implement a drought contingency plan that will implement water mandatory water conservation measures.
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage and mandatory water restrictions for water conservation.

Status	Completed and adopted on 4/02/2019

City of Blue Ridge Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would help identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.

Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Blue Ridge Action Items: New

City of Blue Ridge Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard..
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC

Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation

City of Blue Ridge Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

City of Blue Ridge Action Item	Develop and Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Winds, Tornado, Hail
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC

Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofits
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	

City of Blue Ridge Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	The City of Blue Ridge will expand its current siren program into newly developed areas of the jurisdiction that are currently outside of siren coverage. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Blue Ridge Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-5 years

Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire and implement mitigation actions to reduce vulnerability.

City of Blue Ridge Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would help identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Blue Ridge Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years

Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Blue Ridge Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

City of Anna Action Item	Develop City's drought contingency plan.
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results may entail retrofits for low-flow plumbing.
Effect on New Buildings	Results may require new codes for low-flow plumbing and foundations.
Cost Effectiveness	Low cost for effective means of preserving water.

Discussion	Utilize existing plan for conserving water based on the stages of drought. Plan includes strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

National Flood Insurance Program (NFIP) Compliance

The City of Blue Ridge is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 Blue Ridge NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481628#	BLUE RIDGE, TOWN OF	COLLIN COUNTY	-	04/02/1991	06/02/2009(M)	04/02/91	No

(M): No Elevation Determined - All Zone A, C and X
Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 Blue Ridge NIFP Activity

Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City Manager	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the Department of Environmental Health. City of Blue Ridge requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
	Floodplain development permits	Permits are required for any new construction in a floodplain.	
	Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	City of Blue Ridge participates in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	
	Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	City of Blue Ridge public works installs signs at low water crossings that indicate "When flooded turn around don't drown".	
	Future Mitigation Projects	City of Blue Ridge will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the City of Blue Ridge has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Blue Ridge, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Blue Ridge will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented table 7.1:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Fire Chief	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Likewise, each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submit same for approval by the state, FEMA and each local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Blue Ridge	City manager, City Council	Budget Meetings.	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	City manager, Fire Chief	Emergency Action Plan updates	Once every five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	City manager, Director of Public Works	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City manager, Planning director	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	City manager, Director of Public Works	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	City manager, Planning Director	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the City of Blue Ridge Hazard Mitigation Planning Committee considers this

HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

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Annex E: City of Celina

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Celina participated in the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the City of Celina. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Celina. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Celina has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Celina officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface analysis
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Celina Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November, 2020 with representatives from participating county jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. The efforts of the planning committees and the HMPT were led by the Collin County Assistant Emergency Management Coordinator.

Table 2.2 below provides a list of the primary representatives on the Celina planning committee.

Table 2.2 Hazard Mitigation Committee– Primary Representatives

Representing	Position	Role
City of Celina	Fire Chief	Plan development
City of Celina	Deputy Fire Chief	Plan development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and

worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Fire Department	Fire chief/ Deputy Fire chief	Emergency Response Capabilities
Police Department	Police chief/Sergeant	Emergency Response Capabilities
City Engineering	City Engineer	Infrastructure Preparedness
Public Works	Public Works Director	Utilities Preparedness
City Planning	City Planner	Development Planning

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Collin County HazMAP Kickoff Meeting – 11/05/2020
- City of Celina Hazard Mitigation Team Meeting – 12/3/2020
- City of Celina HazMAP Discussion/Update – 1/5/2021
- City of Celina Hazard Team Meeting – 12/4/2020
- Collin County Public Meeting – 11/2/2021at 2PM
- Collin County Public Meeting 01/12/2022

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring

communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Celina identified several natural hazards and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Chapter 3 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for City of Celina

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	2	0	1	0.8
Drought	3	0	0	3	1.2
Earthquake	0	0	0	0	0
Expansive Soils	3	0	0	1	1
Extreme Heat	3	1	0	3	1.55
Flooding	3	2	1	2	2.05
Hail	2	0	0	2	0.8
High Winds	2	0	0	3	0.9
Lightning	3	1	0	2	1.45
Tornado	2	2	3	2	2.25
Wildfire	1	1	1	3	1.2
Winter Storms	1	1	2	3	1.45

The conclusions drawn from the hazard profiling process for the City of Celina resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Celina.

Table 3.3 Hazard Rankings for City of Celina

High Risk (PRI 2 - 3)	Tornado Flooding
Moderate Risk (PRI 1.01 -1.9)	Extreme Heat Wildfire Winter Storms Lightning Drought
Low Risk (PRI 0.50 – 1)	Expansive Soils High Winds Dam Failure Hail
Negligible to No Risk (PRI 0 – 0.49)	Earthquake

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Celina faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure The City of Celina has identified one dam that poses a threat to the northern part of Preston Road. The dam is located and Kirk Ranch and could cause damage to Preston Road if it were to fail. The dam has a less than 1% probability to fail.

Drought The City of Celina is at moderate risk for a drought occurring. The city needs to enforce water conservation laws and continue to conserve and maintain the water supply. Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Celina are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. The Lake Ray Roberts-Lewisville-Grapevine reservoir system, Trinity Aquifer, and Woodbine Aquifer are water sources for the City of Celina and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake This hazard was identified as having negligible to no risk. All property and populations have the potential to be affected by earthquake. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils Expansive soils are categorized as a high probability occurrence annually, but overall as low risk. However, it is unlikely that this hazard will cause any loss of life or severe property damage.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding The City of Celina is surrounded by large agricultural land mass with very few concrete structures. This lack of development keeps water from impacting a large percentage of property within the city. Historically, the City of Celina has responded to streets impacted by floodwater. Overall, the City of Celina has not had to deal with large amounts of property damage or life impacts because of flooding.

Hail All geographic areas and populations in the City of Celina have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds All geographic areas in the city of Celina have the potential to be vulnerable to high winds. High wind events can cause debris on roadways which can endanger people's lives and property. Manufactured homes and exposed populations are most vulnerable.

Lightning All geographic areas and populations in the City of Celina have the potential to be vulnerable to lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado All geographic areas and populations in the City of Celina have the potential to be vulnerable to tornados. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire The City of Celina is less than 41.77% built-out with the remainder as maintained agricultural land. The projected buildout for the City of Celina is roughly 380,000 people. Due to a high concentration of fuel within the city limits of the City of Celina, wildfires have been considered a possible risk for the city. Wildfire poses a low life impact risk and property impact risk with a high spatial extent impact. In order to mitigate against this wildfire risk, agricultural land needs to remain well maintained in order to prevent the spread of fire. Structures and populations in the WUI are most vulnerable to wildfire. According to the Texas A&M Forest Service, 54%-of the City of Celina lives in the Wildland/Urban Interface.

Winter Storms The City of Celina has identified winter storms as the hazard that could cause the most interruption in daily life and business. A winter storm would have a large property impact as well as a spatial impact. In 2013, response by first responders was an issue because the departments did not have vehicles that could drive on ice safely. Loss of power and heat to critical buildings and infrastructure was also an issue.

Identification of Assets and Vulnerability Assessment

An inventory of Celina geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were

evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the City of Celina the current in City population is 22,105 people as of December 1st 2020. The Service Area population (Light Farms included) is 27,607 people as of December 1st 2020.

According to the 2020 NCTCOG Population Estimates and the US Census Bureau, the total estimated population of the City of Celina in 2019 is 16,299 people, with 5,253 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
City of Celina	27,607	1.31%	514.06	6,101	1.59%	181.00

Source: US Census Bureau &
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Celina).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Celina	6,028	13,090	17,680	4,590	35.06%

Source: 2020 NCTCOG Population Estimates

Property

There are an estimated 10,132 thousand parcels in the City of Celina, with an estimated $1,588,281,438 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Celina	10,132	1.19%	$1,588,281,438

Source: County Data and Regional Hazard Assessment Tool

[1] Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

This also includes properties from Denton County. The % of County only reflects the Collin County portion of Celina and in relation to only Collin County.

Emergency Facilities

There are three identified emergency facilities in the City of Celina, including two fire stations and one police station. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Celina	2	1	0

Source: Celina GIS Dept

Critical Facilities

There are 8 critical facilities, which are considered non-emergency in the City of Celina. The critical facilities include 7 schools, and 1 historical properties. (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Celina	7	1

Source: Celina GIS Dept
1 High School – Celina ISD
1 Middle School – Celina ISD
3 Elementary Schools – Prosper ISD
2 Elementary Schools – Celina ISD

Critical Infrastructure

There are 6 identified critical infrastructure facilities in City of Celina, including 3 water treatment facilities, 1 wastewater treatment facility, 1 dam, and 1 bridge (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Celina	0	0	1	3	5	1

Source: Celina GIS Dept
4 Low Hazard Dam and 1 Uknown Hazard Dam within the City Limits

Methodology

Based on the type of information available for analysis, the City of Celina vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Celina, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	

Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) 0 recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Celina are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Celina. The City of Celina and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Celina is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Celina are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Celina are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Celina

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero fatalities and injuries per year. Approximately 332 residential parcels in the City of Celina are located within the 100-year floodplain.
Improved Property	Though there have been six (6) recorded flood events in the City of Celina, property losses are at $12,666.67 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $27,779,401 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected at $7,714.29 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Celina indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Celina are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Celina are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Celina are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Celina is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected at $1,312.86 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Celina.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Celina are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Celina are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Celina are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in The City of Celina. All the population of the City of Celina is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected at $1,041.67 per year however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Celina are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Celina are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Celina are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Celina. All the population of the City of Celina is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected at $428.57 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Celina.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Celina are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Celina are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Celina are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 41.77% of the City of Celina is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown but unknown due to lack of accurate reporting; therefore, 41.77% percentage of the overall property improvement values across the City of Celina are also unknown.
Emergency Facilities	Based on geographic information there are 0 fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facility, and 0 water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Celina. All the population of City of Celina is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Celina are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in City of Celina.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in City of Celina are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in City of Celina are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in City of Celina are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Celina considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
City of Celina	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	N	**71%**
Average % Yes Capabilities – 71%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes per Jurisdiction
City of Celina	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	**90%**
Average % Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
City of Celina	N	Y	Y	Y	Y	Y	Y	Y	N	N	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify the city of Celina's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that, on average, the city of Celina has 71% of identified legal and regulatory capabilities, 90% of identified and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Celina	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions, expand, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Celina Hazard Mitigation Planning Committee developed mitigation strategies for this plan.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Celina.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Celina Action Items: Deferred from 2016 Plan

City of Celina Action Item	Purchase and utilize mobile back-up generator
Hazard(s) Addressed	Flooding, Tornado, Earthquake, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds
Goal/Objective	2-D
Priority	High
Estimated Cost	$5,000 - $10,000
Potential Funding Sources	Local Funding
Potential Matching Sources	Local Funding
Lead Department	Public Works, OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofit with ability to connect with generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to generator
Cost Effectiveness	Backup generator will prevent loss of power and data to critical government buildings
Discussion	Introduction of a mobile back-up generator will allow the City of Celina or other critical facilities to function as close to normal as possible in the event of a massive power loss.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Develop and implement a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Implement all-hazards community education program, including information on mitigation activities.
Hazard(s) Addressed	Flooding, Tornado, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds, Earthquake, Expansive Soils, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, FEMA
Lead Department	OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Educating public on mitigation against loss of life and property will save government resources in the event of a disaster event
Discussion	Community education is important for reducing loss of life and property.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Celina Action Item	Analyze needs, develop and implement water conservation measures for new populations
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM
Implementation Schedule	2-3 years
Effect on Old Buildings	New constraints will be placed on water usage without compromising soil integrity.
Effect on New Buildings	New constraints will be placed on water usage without compromising soil integrity.

Cost Effectiveness	Expanded water and soil consistency standards will help the city of Celina plan for a boost in infrastructure and population and help maintain normal water levels
Discussion	As the City of Celina grows water conservation measures will encompass new infrastructure and residential/commercial areas. This plan implements conservation efforts that also maintain soil consistency, mitigating damage from expansive soils.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning

Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Celina Action Items: New

City of Celina Action Item	Purchase and utilize mobile back-up generator
Hazard(s) Addressed	Flooding, Tornado, Earthquake, Extreme Heat, Lightning, Wildfire, Winter Storms, Dam Failure, Hail, High Winds
Goal/Objective	2-D
Priority	High
Estimated Cost	$5,000 - $10,000
Potential Funding Sources	Local Funding

Potential Matching Sources	Local Funding
Lead Department	Public Works, OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofit with ability to connect with generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to generator
Cost Effectiveness	Backup generator will prevent loss of power and data to critical government buildings
Discussion	Introduction of a mobile back-up generator will allow the City of Celina or other critical facilities to function as close to normal as possible in the event of a massive power loss.

City of Celina Action Item	Develop and implement a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Celina Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High

Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken on structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken on structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

City of Celina Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, FEMA
Lead Department	OEM
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Celina Action Item	Analyze needs, develop and implement water conservation measures for new populations

Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	High
Estimated Cost	$1,000 - $5,000
Potential Funding Sources	Local funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM
Implementation Schedule	2-3 years
Effect on Old Buildings	New constraints will be placed on water usage without compromising soil integrity.
Effect on New Buildings	New constraints will be placed on water usage without compromising soil integrity.
Cost Effectiveness	Expanded water and soil consistency standards will help the city of Celina plan for a boost in infrastructure and population and help maintain normal water levels
Discussion	As the City of Celina grows water conservation measures will encompass new infrastructure and residential/commercial areas. This plan implements conservation efforts that also maintain soil consistency, mitigating damage from expansive soils. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Celina Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low

Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Celina Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Celina Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.

Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Celina Action Item	Purchase and implement citywide radio communications system
Hazard(s) Addressed	Dam Failure, Earthquake, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$150,000 -$165,000
Potential Funding Sources	Local funding, Grant funding
Potential Matching Sources	Local grants, citizen match
Lead Department	Public Works, OEM, Police, Fire
Implementation Schedule	2-3 years
Effect on Old Buildings	No effect on old buildings
Effect on New Buildings	No effect on old buildings
Cost Effectiveness	Allow for consistent and reliable communication across all departments in the city. To include Police, Fire, Emergency Management, Public Works, and City officials
Discussion	This project will improve the overall communication in the city by installing repeaters and implementing a clear and reliable city wide radio system.

City of Celina Action Item	Frontier/Parvin Road extension and bridge project
Hazard(s) Addressed	2-A, 2-B, 2-D, 2-E, 4-C
Goal/Objective	Flooding
Priority	High
Estimated Cost	$60,000,000
Potential Funding Sources	Local funds, in-kind, donations, citizen cost-share, Local grants, Federal grants, State grants
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to flooding
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to flooding by adding bridges over low lying roadway
Cost Effectiveness	Low

Discussion	Project outputs will guide development of future flood mitigation projects.

National Flood Insurance Program (NFIP) Compliance

The City of Celina is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 Celina NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480133#	CELINA, CITY OF	DENTON COUNTY/COLLIN COUNTY	4/12/1974	11/1/1979	4/18/2011	11/1/1979	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 Celina NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Celina	City Manager	Actions are taken to prevent flood damage to pre-existing structures, reduce loss of life	Regularly hold educational seminars within the community to inform citizens in flood-prone areas	During meetings to create, adopt, update, or otherwise change any documents that have an effect on vulnerability to natural

		in flood prone areas	about the benefits of having flood insurance	hazards, the City of Celina will consult the most recent version of the Hazard Mitigation Action Plan. Provided there is sufficient political, fiscal, and administrative capability, actions detailed in the HazMAP will be integrated into the document wherever applicable.

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Celina, the county, and the city/town council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning team, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Celina will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Deputy Fire Chief	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Likewise, each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting same for approval by the state, FEMA and each local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Celina	City Council, City Manager	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Fire Chief, Deputy Fire Chief	Emergency Action Plan updates	Every five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	County Commissioners	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, County Commissioners	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Public Works Director, County Commissioners	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Once the plan is adopted, the HMPT will coordinate implementation with the engineering, planning, and emergency management departments for the county, participating jurisdictions, river authorities, and drainage districts.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The HMPT and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex F: Town of Fairview



1. Introduction

This annex was prepared in 2021 as part of an update to the Town of Fairview Multi-Jurisdictional Hazard Mitigation Action Plan. Following the review and approval of the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA), This annex shall be updated every five (5) years or as necessary to ensure its continued accuracy and effectiveness. The Town of Fairview participates on the Collin County HazMAP Hazard Mitigation Planning Team (HMPT). In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the Town of Fairview. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Fairview has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Fairview officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Fairview's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), The Town of Fairview developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten The Town of Fairview and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. Table 2.1 outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2021	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface

Source	Data
National Inventory of Dams	Dam Information
Texas Commission on Environmental Quality	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by The Town of Fairview Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County.

The Collin County HMPT was assembled with representatives from participating planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. Table 2.2 provides a list of the primary representatives on the Fairview planning committee and the departments they represent.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
The Town of Fairview Town Council	Mayor	Input and Review
The Town of Fairview Town Administration	Town Manager	Input and Review
The Town of Fairview Emergency Management	Emergency Management Coordinator	Plan Leader
The Town of Fairview Fire Department	Fire Chief	Input and Review
The Town of Fairview Public Works	Town Engineer	Input and Review
The Town of Fairview Police Department	Police Chief	Input and Review

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Office to provide technical assistance and necessary data to the HMPT and planning committees.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning committee as coordinated by the Town of Fairview or

Collin County.

- Assisted the Town of Fairview and Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted the Town of Fairview and Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with the Town of Fairview and Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Baxter I.T. Consulting Services	Owner/Operator	Review of plan
Lincoln Property Company	COO/Senior Vice President	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were hosted by Collin County and included all participating jurisdictions:

- HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – November 11, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public

participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the Town of Fairview identified several natural hazards and man-made hazards that could affect the town. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016-2021 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the Town of Fairview and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for the Town of Fairview jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Town of Fairview HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in the Town of Fairview based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for the Town of Fairview, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaking down the value of each category is below.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3

35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the Town of Fairview

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	0	0.35
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	1	0.75
Hail	2	0	0	1	0.7
High Winds	1	0	0	1	0.4
Lightning	1	0	0	0	0.3
Tornado	2	1	1	1	1.3
Wildfire	1	0	0	1	0.4
Winter Storms	2	0	0	2	0.8

The conclusions drawn from the hazard profiling process for the Town of Fairview resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the Town of Fairview.

Table 3.3 Hazard Rankings for the Town of Fairview

High Risk (PRI 2.00-3.00)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Drought
Low Risk (PRI 0.50 – 1)	Extreme Heat Winter Storms Flooding Expansive Soils Hail
Negligible to No Risk (PRI 0-0.49)	Wildfire Earthquake High Winds Lightning Dam Failure

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the Town of Fairview faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure The Town of Fairview has three (3) dams or levees in its jurisdiction and we are unaware of any significant structures upstream from our jurisdiction which could potentially cause harm within our jurisdiction. This hazard was identified as having negligible to no risk to the jurisdiction, but as a participant in the county plan inundation studies will be considered.

Drought This hazard was identified as having moderate risk similar to the rest of the county and surrounding jurisdictions. Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of the Town of Fairview are vulnerable to this hazard. The agriculture industry is typically affected the hardest due to a lack of crops, water for livestock, and feed. The Town of Fairview has minimal agricultural crops and livestock in its jurisdiction. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the town and are vulnerable to drought. As a drought continues, many residents

who are on private wells as well as those served by the over taxed North Texas Municipal Water District begin to experience water shortages. The lack of water can also impact emergency responder capabilities in the form of firefighting efforts.

Earthquake Due to the risk being associated to a distant quake, earthquakes have the potential to affect the entire planning area. This hazard was identified as having negligible to no risk to the jurisdiction. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils While there are no documented significant occurrences of damage to structures in its jurisdiction, the Town of Fairview residents do from time-to-time experience foundation issues due to shifting soils. This hazard was identified as having low risk similar to the rest of the county and surrounding jurisdictions.

Extreme Heat This hazard was identified as having low risk similar to the rest of the county and surrounding jurisdictions. Extended extreme heat can cause a rapid and continual loss of moisture in vegetation leading to an escalation of wildfires. Most of the Town of Fairview jurisdiction is developed residential property with some areas of wild land interface in our ETJ. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable. The potential exists for extended heat emergencies to exceed capabilities of our local hospital and Emergency Medical System (in surrounding jurisdictions) due to a large elderly population (1144 units) in Heritage Ranch, an active adult community within the Town of Fairview.

Flooding Common flooding hazards within the planning area include flood hazards from flash flooding and from new development. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges. This hazard was identified as having low risk in the Town of Fairview's jurisdiction mainly due to limited areas in a flood plain and the potential for flash flooding in the extreme eastern portion of the Town of Fairview's and the ETJ.

Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. Hail has the potential to affect the entire planning area. This hazard was identified as having low risk similar to the rest of the county and surrounding jurisdictions. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Wind is defined as the motion of air relative to the earth's surface. The horizontal component of the three-dimensional flow and the near-surface wind phenomenon are the most significant aspects of the hazard. Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong

tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds may affect the entire planning area.

The Town of Fairview has the potential for power outages, fires, damage to roofs, cars, out buildings, and electrical utilities due to high winds. Areas affected may pose access challenges due to fallen trees on roadways. High winds can occur suddenly and without warning during severe weather. Outside of primary residential structures, there are few locations for the public to seek shelter during high winds. This hazard was identified as having negligible risk to the jurisdiction.

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A "bolt" or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes.

Bolts of lightning can reach temperatures approaching 50,000° Fahrenheit. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. The Federal Emergency Management Agency states that an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. All geographic areas, property, and populations in the Town of Fairview have the potential to be vulnerable to lightning. This hazard was identified as having negligible to no risk to the jurisdiction. Property without lightning protection and exposed populations are most vulnerable.

Tornado A tornado is a violently rotating column of air, in contact with the ground, both pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel. Tornadoes have the potential affect the entire planning area. This hazard was identified as having moderate risk similar to the rest of the county and surrounding jurisdictions. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire A wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildland fires are fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted. Wildland fires affect the entire planning area. For the purposes of this hazard analysis, wildland fires are assessed under what is known as the Wildland Urban Interface (WUI). The WUI is an area of development that is susceptible to wildland fires due to the number of structures located in an area with vegetation that can act a fuel for a wildland fire. 91% of the Town of Fairview is located in the WUI. The Texas A&M Forest Services' wildfire risk assessment report ranks the wildfire threat from low to moderate with the west side of the town located in the low threat area and the east side of town in the moderate threat area.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. Winter

storms affect the entire planning area. Cold snaps in which temperatures fall below the freezing point of 32° Fahrenheit do happen on an annual basis in the planning area and can lead to issues with infrastructure, especially frozen roads and bridges. For the Town of Fairview, this hazard was identified as having low risk similar to the rest of the county and surrounding jurisdictions. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time.

Identification of Assets and Vulnerability Assessment

An inventory of the Town of Fairview geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates and the Collin County Appraisal District, the total population of the Town of Fairview in 2020 was 9,770 people, with 3,601 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
Town of Fairview	9,770	.90%	1,045.35	4,582	1.20%	490.25

Source: 2020 NCTCOG Population Estimates Publication, US Census Bureau & Collin County Appraisal District
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for Town of Fairview).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Town of Fairview	7,248	9,520	9,610	90	.95%

Source: 2020 Census Data & 2020 NCTCOG Population Estimates Publication

Property

There are an estimated 4,547 parcels in the Town of Fairview, with an estimated $1,596,754,123 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Town of Fairview	4,547	1.30%	$1,596,754,123

Source: Collin County Appraisal District
[1] Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There are three (3) identified emergency facilities in the Town of Fairview, including two (2) fire stations, one (1) police station and zero (0) hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Town of Fairview	2	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are three (3) critical facilities, which are considered non-emergency in the Town of Fairview. The critical facilities include three (3) schools and zero (0) historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Town of Fairview	3	0

Source: Local jurisdictions

Critical Infrastructure

There are eight (8) identified critical infrastructure facilities in the Town of Fairview, including zero (0) airports, zero (0) natural gas facilities, zero (0) water treatment facilities, zero (0) wastewater treatment facility, zero (0) dams, and eight (8) railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Town of Fairview	0	0	0	0	3	7

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the Town of Fairview's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the Town of Fairview, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Fairview are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the Town of Fairview are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.

Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the Town of Fairview. The Town of Fairview and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is minor impact of extreme heat to developed areas and the improved property in the Town of Fairview is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is minor impact of extreme heat to buildings and the emergency facilities in the Town of Fairview are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is minor impact of extreme heat to buildings, and the critical facilities in the Town of Fairview are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is minor impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the Town of Fairview.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero fatalities and injuries per year. Approximately 7.38% of the population of the Town of Fairview is located within the 100-year floodplain.
Improved Property	Property losses in the Town of Fairview are expected to be $8,734.83 per year. No crop losses are expected or recorded county-wide. Approximately $7,594,973 of the total assessed value of improvements in the Town of Fairview is at risk from the 100-year storm event.
Emergency Facilities	There are zero (0) emergency facilities at imminent risk from the 100-year storm event.
Critical Facilities	There are zero (0) critical facilities located within the 100-year storm event.

Critical Infrastructure	0% of railways/highways and bridges, 0% of dams, 0% of water treatment works, and 0% waste water treatment facilities are at risk from the 100-year storm event. Many of these structures are designed to traverse or be located within the floodplain due to unavoidable circumstances. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Fairview are expected at $6,426.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the Town of Fairview indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the Town of Fairview are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the Town of Fairview are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the Town of Fairview are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the Town of Fairview is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Fairview are expected at $814.29 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the Town of Fairview.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the Town of Fairview are vulnerable to this hazard.

Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the Town of Fairview are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the Town of Fairview are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from lightning events in the Town of Fairview. All the population of the Town of Fairview is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Fairview are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the Town of Fairview are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the Town of Fairview are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the Town of Fairview are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the Town of Fairview. All the population of the Town of Fairview is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI) property losses in the Town of Fairview are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the Town of Fairview.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the Town of Fairview are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the Town of Fairview are exposed and vulnerable to this hazard.

Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the Town of Fairview are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 84.42% of the Town of Fairview is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the Town of Fairview are also unknown.
Emergency Facilities	Based on geographic information there are two (2) fire stations and one (1) police station at risk from wildfire events.
Critical Facilities	Based on geographic information there are three (3) schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are zero (0) bridges, zero (0) dams, zero (0) wastewater treatment facility, and zero (0) water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the Town of Fairview. All the population of the Town of Fairview is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Fairview are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the Town of Fairview.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the Town of Fairview are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the Town of Fairview are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the Town of Fairview are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Town of Fairview considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
Town of Fairview	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	**93%**
Average % Yes Capabilities – %															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	**Planner(s) or engineer(s) with knowledge of land development and land management**	**Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure**	**Planners or engineer(s) with an understanding of natural and/or human caused hazards**	**Floodplain manager**	**Surveyors**	**Staff with education or expertise to assess the community's vulnerability to hazards**	**Personnel skilled in GIS**	**Scientists familiar with the hazards of the community**	**Emergency manager**	**Grant writers**	**% Yes per Jurisdiction**
Town of Fairview	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	**90%**
Average % Yes Capabilities – %											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	**Community Development Block Grants (CDBG)**	**Capital improvements project funding**	**Authority to levy taxes for specific purposes**	**Fees for water, sewer, gas, or electric service**	**Impact fees for homebuyers or developers for new developments/homes**	**Incur debt through general obligation bonds**	**Incur debt through special tax bonds**	**Incur debt through private activity bonds**	**Withhold spending in hazard-prone areas**	**Other**	**% Yes per Jurisdiction**
Town of Fairview	N	Y	Y	Y	Y	Y	Y	N	Y	Y	**80%**
Average % Yes Capabilities – 80%											
Y- Yes N- No ?- Don't Know											

To quantify the Town of Fairview's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the town of Fairview has a moderate level of identified legal and regulatory capabilities, a strong level of identified administrative and technical capabilities, and strong level of identified fiscal capabilities per the rating categories.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Town of Fairview	Town Manager	The town council, including the mayor, mayor pro-tem, and council members, along with the town manager, address the budget; approve/pass ordinances, regulations, and codes; hire staff; approve plans; and determine the direction of the town overall. As the governing body, the ability to implement and approve mitigation actions, expand, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016-2021 HazMAP, the Town of Fairview Hazard Mitigation Planning Committee developed mitigation strategies for the Plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through encouragement of the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Work with stake holders to identify high hazard critical infrastructure for the possibility of rehabilitation or retrofit.
Objective 2-C Assess the need for enacting and/or enforcing regulatory measures that enforce hazard mitigation measures.
Objective 2-D Ensure the construction of new facilities take into account methods designed to mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Update hazard/vulnerability assessments of personal properties and structures located in flood zones within the Town of Fairview.
Objective 3-B Develop and execute new awareness programs which identify and reduce threats from natural hazards.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

Town of Fairview Action Items: Deferred from 2016 Plan

Town of Fairview Action Item	Implement all-hazards public education program, including hazard mitigation activities for each identified hazard
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	3-B, 4-A, 4-B, 4-C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public Education is extremely effective for low cost
Discussion	The Town of Fairview will implement an all-hazards comprehensive public education program based on the hazards identified in this annex and what actions can be taken to mitigate impacts. This program will use a variety of means for distributing information,

	including social media, printed literature, and via the Town of Fairview official website.
Status	Town began the implementation of this action item via online public education materials. Town plans to receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Town of Fairview Action Item	Implement tornado safe room education program
Hazard(s) Addressed	High Winds, Tornados
Goal/Objective	1-C
Priority	Medium
Estimated Cost	$500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-3 years
Effect on Old Buildings	Retrofit will be required on some structures
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Moderate to high depending on level of acceptance
Discussion	Residential safe room shelters potentially decrease the likelihood of personal injuries and death during severe weather, tornado or hail events.
Status	Will be included in 2021, however, some residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of Fairview Action Item	Implement and actively promote Nixle Notification alert system.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	1-A, 1-B, 3-B, 4-A, 4-B
Priority	Medium
Estimated Cost	$1,500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-3 years

Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warnings will assist in saving lives for no cost.
Discussion	Weather/all-hazards notifications are a proven means to alert and warn citizens about severe weather conditions and other emergency and hazard information.
Status	This action item was implemented and will continue to be promoted in order to increase subscribers. Continue – will be included in 2021.

Town of Fairview Action Item	Update and enforce water conservation measures and implement public education outreach
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C, 3-C
Priority	Medium/Low
Estimated Cost	$1000
Potential Funding Sources	Operating Budget
Potential Matching Sources	North Texas Municipal Water District
Lead Department	Public Works, Code Enforcement
Implementation Schedule	1-2 years
Effect on Old Buildings	Water conservations measures would stabilize soils, mitigating damage to existing structures.
Effect on New Buildings	Water conservations measures would stabilize soils, mitigating damage to new structures.
Cost Effectiveness	Low-cost effort for increasing awareness of water restrictions.
Discussion	Town of Fairview will review water conservation measures and update as necessary. These conservation efforts regulate water used for maintaining soil consistency. Updates will be communicated to the public.
Status	The Town has a Water Conservation Plan and a Drought Contingency and Water Emergency Response Plan it reviews and updates, if necessary. No updates were necessary in recent years. Continue – will be included in 2021.

Town of Fairview Action Item	Develop and implement regulations for the construction of town buildings deemed “critical infrastructure”.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	1-C, 2-A, 2-B, 2-C, 2-D, 2-E
Priority	Medium/Low

Estimated Cost	$5000
Potential Funding Sources	Operating Budget
Potential Matching Sources	NCTCOG/FEMA
Lead Department	Emergency Management
Implementation Schedule	2-3 years
Effect on Old Buildings	May involve cascading retrofits
Effect on New Buildings	Strengthening construction requirements for new critical infrastructure will result in greater resiliency to hazards
Cost Effectiveness	Moderate to High.
Discussion	Town will develop and implement construction design regulations for new Critical Infrastructure, as defined by the EMC. Regulations would include elevating structures, reinforcing doors and windows, using flame-retardant, hail and wind resistant external materials, roof bracing, installing higher grade insulation, stabilizing foundations, installing lightning rods, and using low-flow technology for all plumbing.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	Medium/Low
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Engineering/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management, Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

Town of Fairview Action Items: New

Town of Fairview Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	3-B, 4-A, 4-B, 4-C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

Town of Fairview Action Item	Implement tornado safe room education program
Hazard(s) Addressed	High Winds, Tornados
Goal/Objective	1-C
Priority	Medium
Estimated Cost	$500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-3 years
Effect on Old Buildings	Retrofit will be required on some structures
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Moderate to high depending on level of acceptance
Discussion	Residential safe room shelters potentially decrease the likelihood of personal injuries and death during severe weather, tornado or hail events.

Town of Fairview Action Item	Implement and actively promote Nixle Notification alert system.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning
Goal/Objective	1-A, 1-B, 3-B, 4-A, 4-B
Priority	High
Estimated Cost	$1,500
Potential Funding Sources	Operating Budget
Potential Matching Sources	Local Grants/FEMA
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warnings will assist in saving lives for no cost.
Discussion	Weather/all-hazards notifications are a proven means to alert and warn citizens about severe weather conditions as well as other emergency and hazard information.

Town of Fairview Action Item	Update and enforce water conservation measures and implement public education outreach
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C, 3-C
Priority	Medium/Low
Estimated Cost	$1000
Potential Funding Sources	Operating Budget
Potential Matching Sources	North Texas Municipal Water District
Lead Department	Public Works, Code Enforcement
Implementation Schedule	1-2 years
Effect on Old Buildings	Water conservations measures would stabilize soils, mitigating damage to existing structures.
Effect on New Buildings	Water conservations measures would stabilize soils, mitigating damage to new structures.
Cost Effectiveness	Low-cost effort for increasing awareness of water restrictions.
Discussion	Town of Fairview will review water conservation measures and update as necessary. These conservation efforts regulate water used for maintaining soil consistency. Updates will be communicated to the

	public. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

Town of Fairview Action Item	Develop and implement regulations for the construction of town buildings deemed “critical infrastructure”.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning
Goal/Objective	1-C, 2-A, 2-B, 2-C, 2-D, 2-E
Priority	Medium/Low
Estimated Cost	$5000
Potential Funding Sources	Operating Budget
Potential Matching Sources	NCTCOG/FEMA
Lead Department	Emergency Management
Implementation Schedule	2-3 years
Effect on Old Buildings	May involve cascading retrofits
Effect on New Buildings	Strengthening construction requirements for new critical infrastructure will result in greater resiliency to hazards
Cost Effectiveness	Moderate to High.
Discussion	Town will develop and implement construction design regulations for new Critical Infrastructure, as defined by the EMC. Regulations would include elevating structures, reinforcing doors and windows, using flame-retardant, hail and wind resistant external materials, roof bracing, installing higher grade insulation, stabilizing foundations, installing lightning rods, and using low-flow technology for all plumbing.

Town of Fairview Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes

Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

Town of Fairview Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management, Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

National Flood Insurance Program (NFIP) Compliance

The Town of Fairview is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481069#	FAIRVIEW, TOWN OF	COLLIN COUNTY	1/10/1975	11/1/1979	6/7/2017	11/1/1979	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Town of Fairview	Town Engineer	Review new development adjacent to floodplains and require 3 feet of freeboard (existing floodplain) or 2 feet of freeboard	Development plans are reviewed. If base flood elevations are known, then set minimum FF elevations on plats. If base flood elevations are unknown, developer must perform flood modeling to establish the BFE.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, the use of Flood Hazard zoning regulations, and compliance inspections pending approval. Failure to comply with the Town's flood damage prevention order shall result in fines up to $2000 per violation per day.
		Floodplain development permits	Permits are required for any new construction in a floodplain, including fill. Fairview prohibits structures that enclose people or animals in the flood plain.	
		Reduce flooding effects of upstream development on downstream properties in or near the flood plain	Fairview is having a drainage master plan prepared to lessen the effects of upstream development on downstream flooding including regional detention	
		Maintain a zero rise in the floodplain near sensitive properties	Fairview requires computer modeling and hydraulic calculations to demonstrate a zero rise in the 100 year flood plain near properties that are threatened	
		Future Mitigation Projects	Fairview has identified some property for floodplain mitigation and will work with developers to make improvements at the time of development	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Fairview has developed a plan maintenance process which is described in the following paragraphs. The Town of Fairview along with participating jurisdictions is responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the Town of Fairview, the county, and the city/town council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the Town of Fairview will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Emergency Management Coordinator	Monitoring Plan: Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Likewise, each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting same for approval by the state, FEMA and each local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Town of Fairview	Town Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	Town Council, Town Engineer	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, Town Council	Drought Contingency plans	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Town Engineer, Town Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Fairview Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Farmersville participated on the Collin County Hazard Mitigation Planning Team (HMPT). In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Farmersville. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Farmersville has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Collin County officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Farmersville Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating county jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. The efforts of the planning committees and the HMPT were led by the Collin County Assistant Emergency Management Coordinator. The table below provides a list of the primary representatives on the Farmersville planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City of Farmersville	Fire Chief	Plan Development
City of Farmersville	GIS Analyst	Plan Development
City of Farmersville	City Manager	Plan Development
City of Farmersville	City Secretary	Plan Development/Primary Point of Contact
City of Farmersville	Chief of Police	Plan Development
Collin County Homeland Security	Assistant Emergency Manager	Plan Assistance

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified

risks.

- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Farmers Insurance	Insurance Agent	Review of plan
State Farm Insurance	Insurance Agent	Review of plan
First Baptist Church, Farmersville	Disaster Response Coordinator	Review of plan
North Texas Municipal Water District	Representative for Farmersville	Review of plan
RE/MAX International	Realtor	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, the City of Farmersville organization is committed to accomplishing the following activities:

- Appoint members to a Coordinating Committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by the City of Farmersville:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – April 21, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022TBD

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee identified several natural hazards and man-made hazards that could affect Farmersville. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the City of Farmersville and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy. The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for City of Farmersville

The conclusions drawn from the hazard profiling process for the City of Farmerville resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Farmersville.

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	1	2	1	0	1.25
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	0	0.65
Hail	2	0	0	1	0.7
High Winds	2	1	0	1	1.05
Lightning	1	0	0	0	0.3
Tornado	2	1	1	1	1.3
Wildfire	1	2	0	1	1.1
Winter Storms	2	1	2	3	1.75

Table 3.3 Hazard Rankings City of Farmersville

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Winter Storm Dam Failure Tornado Drought Wildfire High Winds
Low Risk (PRI 0.50 – 1)	Expansive Soils Extreme Heat Hail Flooding
Negligible to No Risk (PRI 0 – 0.49)	Earthquake Lightning

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Farmersville faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations.

Development of the downstream areas necessitates the original low hazard classifications to be changed to higher hazard classifications because the dams are no longer adequate for the increased downstream risks. NRCS data shows that there are 6 dams in Collin County that are no longer adequate for increased downstream risks. This percentage could actually be higher because detailed current evaluations of NRCS dams have not been conducted due to resource limitations. In addition, many of these inadequate dams have not been updated because many of the legally responsible entities of these dams do not have sufficient mechanisms funding for updates, or even adequate maintenance, in some cases. Soil and Water Conservation Districts do not have any statutory funding capability of their own, and counties, especially those with small populations and multiple dams, are not able to generate the resources needed to sustain a consistent and comprehensive effort upgrade these structures. While no record could be found of any previous dam failures in Collin County, three things are clear:

- These dams are in desperate need of detailed evaluations and consistent maintenance
- Increased development downstream of the dams has put more people, property, and infrastructure at risk.

The City of Farmersville is responsible for 2 high hazard dams identified by the NRCS in both the City Limits of Farmersville due to the use of easements and the Emergency Operations Plans for those dam sites. While a dam failure event would affect jurisdictions not participating in the Collin County Local Mitigation Strategy, the HMT has chosen to include all High Hazard dams the City is responsible for in Emergency Planning for plan incorporation purposes.

Drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Farmersville are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork, and the Lake Chapman-Cooper reservoir system are water sources for the City of Farmersville and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations. The lack of water can also impact emergency responder capabilities (not facilities) in the form of firefighting efforts as Farmersville has one of the largest fire districts in Collin County.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics

holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuing seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Earthquakes have the potential to occur anywhere in the geographic planning area; therefore, all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity. This hazard was identified as having negligible or no risk to the City of Farmersville.

Expansive Soils Any soil that expands when wet and shrinks when dry is an expansive soil. Soils are tested using an accepted standard of measurement to determine swell potential. Expansive soils can exert pressures up to 15,000 lbs. per foot causing the breakdown of building foundations and structural integrity. Roadbeds may also be affected, and could lead to avalanche and collapse when cutting into mountains and hillsides. Problems often associated with expansive soils include foundation cracks, heaving and cracking of floor slabs and walls, jammed doors and windows, ruptured pipelines, having and cracking of sidewalks and roads, and damage to the upper floors of a building when motion in the structure is significant. Expansive soils are present throughout the world are known in every United States state. Every year they cause billions of dollars in damage. The entire Farmersville geographic planning area has the potential to be vulnerable to expansive soils.

Extreme Heat Severe summer heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable. Utilities can also be impacted due to rolling blackouts.

Flooding Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “25-year storm” and “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” most often refers to an area that is subject to inundation by a flood that has a one percent chance of occurring in any given year (commonly and incorrectly referred to as the 100-year floodplain). Common flooding hazards within the planning area include impacts from flash flooding and from new development.

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as new buildings, parking lots, and roads create less land that

can absorb excess precipitation from heavy rains, hurricanes, and tropical storms. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges.
The City of Farmersville has identified several low water crossings that are subject to periodic flash flooding. Affected areas differ with each storm as there are several different branches and tributaries of rivers and creeks subject to overflow, and also are dependent upon which area receives the rain. These areas are low water crossings mainly on improved city streets.

Hail Hail is an outgrowth of a severe thunderstorm in which balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The entire geographic planning area has the potential to be vulnerable to hail, exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Straight-line winds are often responsible for the wind damage associated with a thunderstorm. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds have the potential to affect the entire planning area, manufactured homes and exposed populations are most vulnerable.

High winds are a frequent occurrence with severe thunderstorms and they can affect all areas of Farmersville. These winds can occur suddenly and without warning during severe weather and may pose access challenges due to fallen trees on roadways. There have been several instances of damage occurring to business and commercial structures as a result of high winds. Outside of primary residential structures, there are few locations for the public to seek shelter during high winds.

Lightning Lightning damage results from four (4) effects of lightning strike: electrocution of humans and animals; vaporization of materials along the path of strike; fire caused by the high temperature produced by the strike; and a sudden power surge that can damage electrical and electronic utility substations and distribution lines. It is estimated that throughout the United States, a power outage caused by lightning occurs on 50 percent of the days throughout the year. Lightning has the potential to affect all populations and property in the City of Farmersville. Property without lightning protection and exposed populations are most vulnerable.

Tornado A violently rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel cloud. The entire Farmersville geographic planning area has the potential to be vulnerable to tornadoes. Manufactured homes and exposed populations are extremely vulnerable to tornadoes.

Wildfire Wildfires are any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildfires are fueled almost exclusively by natural vegetation. Interface or intermix fires are urban/wildfires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during

extreme weather and generally burn until conditions change or the available fuel is exhausted. 66.43% of the population is vulnerable to the WUI and the risk is identified as moderate by the Texas Forest Service. Automatic mutual aid between city fire departments is enacted to respond to wildfires, especially during times of drought, burn bans and high fire threat.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard, combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. The entire geographic planning area has the potential to be vulnerable to winter storms. Populations at greatest risk are the elderly, the homeless, and populations without access to heat. Critical facilities are also vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of unincorporated Collin County geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, and the Collin County Emergency Management Coordinator.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, and the Collin County Emergency Management Coordinator.

The following tables provide a breakdown of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates, the total population of the City of Farmersville in 2020 was 3,351 people, with 1,206 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Farmersville	3,351	0.31%	786.62	1,179	0.31%	276.98

Source: 2020 NCTCOG Population Estimate & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Farmersville).

Table 3.5 Population Predictions*

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Farmersville	3,301	3,330	3,340	10	.03%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 1,888 parcels in the City of Farmersville, with an estimated $217,208,478 in total assessed value of improvements. *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Farmersville	1,888	0.48%	$217,208,478

Source: Collin County Appraisal District

Emergency Facilities

There is one identified emergency facilities in Farmersville, including Public Safety Building which houses the fire station and police station. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Farmersville	1	1	0

Source: City/County Data

Critical Facilities

There is four critical facility, which is considered non-emergency in Farmersville. The critical facility is the Public Safety Building which will include schools. (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Farmersville	4	0

Source: Local jurisdictions

Critical Infrastructure

There are 7 identified critical infrastructure facilities in Farmersville, including one airport, a water treatment facility, a wastewater treatment facility, three dams, and one railway/highway bridges (*Table 3.9*). In addition to the information on the table Farmersville also has one electric city wide system.

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Farmersville	1	0	1	1	3	1

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Farmersville's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X

Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Farmersville are expected mostly during water shortages, financially unknown due to lack of accurate reporting .
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Farmersville. The City of Farmersville and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Farmersville is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Farmersville are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Farmersville are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI), the impact of extreme heat to critical infrastructure would be on the one city-wide electrical system.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 5.54% of the population of the City of Farmersville is located within the 100-year floodplain.
Improved Property	There have been three (3) recorded flood events in the City of Farmersville. Property losses are expected but unknown due to inaccurate reporting. No crop losses are expected or recorded county-wide.
Emergency Facilities	There are not emergency facilities at imminent risk from the 100-year storm event.
Critical Facilities	There are not critical facilities located within the 100-year storm event.
Critical Infrastructure	100% of railways/highways and bridges, 100% of dams, 100% of water treatment works, 100% waste water treatment facilities, and 100% electric system facilities are at risk from the 100-year storm event. Many of these structures are designed to traverse or be located within the floodplain due to unavoidable circumstances. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected at $871.43 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Farmersville indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Farmersville are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Farmersville are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Farmersville are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are three (3) recorded injuries and no recorded fatalities from high wind events. All the population of the City of Farmersville is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected at $16,642.86 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Farmersville.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Farmersville are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Farmersville are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Farmersville are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries the City of Farmersville. All the population of the City of Farmersville is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Farmersville are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Farmersville are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Farmersville are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Farmersville. All the population of the City of Farmersville is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected at $22,142.86 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Farmersville.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Farmersville are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Farmersville are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Farmersville are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 66.43%% of the City of Farmersville is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, property losses in the City of Farmersville are expected but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Farmersville are also unknown..
Emergency Facilities	Based on geographic information there is one fire station in City of Farmersville at risk from wildfire events.
Critical Facilities	Based on geographic information there are four schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are one bridge, three dams, one wastewater treatment facility, one water treatment facility, and one electric system at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Farmersville. All the population of the City of Farmersville is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Farmersville are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Farmersville.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Farmersville are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Farmersville are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Farmersville are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Farmersville considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
Farmersville	Y	Y	Y	Y	?	Y	Y	Y	Y	Y	Y	Y	N	N	**84%**
Average % Yes Capabilities – 84%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Farmersville	Y	Y	Y	Y	Y	Y	N	N	Y	Y	**80%**
Average % Yes Capabilities – 80%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Farmersville	Y	Y	Y	Y	Y	Y	Y	N	Y		**90%**
Average % Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

To quantify Farmersville's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, Farmersville has a strong level of identified legal and regulatory capabilities, a strong level of identified administrative and technical capabilities, and a strong level of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Farmersville	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions, expand, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Farmersville Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Farmersville Action Items: Deferred from 2016 Plan

City of Farmersville Action Item	Develop and Implement a Comprehensive Public Education Program to Mitigate the Impacts of Each Identified Hazard.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Farmersville will develop a program for educating the public on our hazards and effective mitigation activities for each. Program will combine distributed written literature and social media to educate residents on hazards, their dangers, and how to mitigate against them to protect life and property.

Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Farmersville Action Item	Develop and implement water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Farmersville will develop stringent regulations/codes for water conservation.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Develop and Implement an Extreme Temperature Program
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Developing heating and cooling shelters as part of an extreme temperature program would allow threatened residents to reduce their vulnerability to extreme temperature hazards.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C, 2-D
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	By implementing its own program separate of that run by the North Central Texas COG, Farmersville would be able to directly target its residents for storm shelter rebates, ensuring their lives and property are protected against High Winds, Tornado, and Hail
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Farmersville Action Item	Purchase and install outdoor warning sirens to increase coverage for new development areas.
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Lightning, Flooding
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000 per siren
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, user fees
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Could entail tower construction on existing buildings

Effect on New Buildings	None
Cost Effectiveness	High. Early warning is a key element in outdoor safety
Discussion	Installing sirens in areas of new development, Farmersville can ensure long-term reduction of vulnerability to life and personal property.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire

Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP would identify locations in Farmersville that are vulnerable to wildfire. These locations might include critical facilities, critical infrastructure, or other properties that are vital to the interests of Farmersville. By identifying these locations, targeted preparedness and response measures can be implemented.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds

Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Farmersville Action Items: New

City of Farmersville Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Farmersville Action Item	Develop and implement water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.

Discussion	Farmersville will develop stringent regulations/codes for water conservation. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Farmersville Action Item	Develop and Implement an Extreme Temperature Program
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Developing heating and cooling shelters as part of an extreme temperature program would allow threatened residents to reduce their vulnerability to extreme temperature hazards.

City of Farmersville Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C, 2-D
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures

Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	By implementing its own program separate of that run by the North Central Texas COG, Farmersville would be able to directly target its residents for storm shelter rebates, ensuring their lives and property are protected against High Winds, Tornado, and Hail

City of Farmersville Action Item	Purchase and install outdoor warning sirens to increase coverage for new development areas.
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Lightning, Flooding, Earthquake
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000 per siren
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, user fees
Lead Department	EMC
Implementation Schedule	1-3 years
Effect on Old Buildings	Could entail tower construction on existing buildings
Effect on New Buildings	None
Cost Effectiveness	High. Early warning is a key element in outdoor safety
Discussion	Installing sirens in areas of new development, Farmersville can ensure long-term reduction of vulnerability to life and personal property. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Farmersville Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones

Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Farmersville Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP would identify locations in Farmersville that are vulnerable to wildfire. These locations might include critical facilities, critical infrastructure, or other properties that are vital to the interests of Farmersville. By identifying these locations, targeted preparedness and response measures can be implemented.

City of Farmersville Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years

Effect on Old Buildings	Results would help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results would identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Farmersville Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Farmersville Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years

Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

National Flood Insurance Program (NFIP) Compliance

The City of Farmersville is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481627#	FARMERSVILLE, CITY OF	COLLIN COUNTY		4/2/1991	06/02/09(M)	4/2/1991	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Manager	NFIP Activity	Activity Description	Enforcement
City of Farmersville	City Secretary	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the City Secretary. The City of Farmersville requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special	The City of Farmersville participates in Risk Assessment, Mapping	

Jurisdiction	Community Floodplain Manager	NFIP Activity	Activity Description	Enforcement
		Flood Hazard Areas for future FIRM maps	and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	per violation plus court costs.
		Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	County Road Operations department installs signs at low water crossings that indicate "When flooded turn around don't drown".	
		Future Mitigation Projects	The City of Farmersville will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In compliance with requirement § 201.6(c)(4)(i), the City of Farmersville has developed a plan maintenance process which is described in the following paragraphs. The City of Farmersville, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Farmersville, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The City of Farmersville's Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Farmersville will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	What	Time
City Manager	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning committee members, changes to capabilities, plan integrations	Biannually
External Stakeholders and Planning Committee	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
City Council	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4)(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in

which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.
Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Farmersville	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan updates	Once every five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Farmersville Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

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Annex H: City of Frisco

1. Introduction

This annex was prepared in 2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. This plan updates the Frisco hazard mitigation plan submitted to FEMA as part of the 2016 Collin County plan. The City of Frisco participated on the Collin County Hazard Mitigation Team (HMPT) for this update. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Frisco. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Frisco has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped the City of Frisco officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and jurisdictional websites.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2012	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface analysis
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Frisco Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and the Collin County HMPT. Frisco planning committee representatives participated on the HMPT, with local efforts led by the City of Frisco Emergency Management Specialist.

The Planning Committee was assembled with representatives from participating planning committees, including city management, police and fire chiefs, engineers, public and private representatives. Collin County acted as the plan development consultant providing hazard mitigation planning services. The table below provides a list of the primary representatives on the Frisco planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City of Frisco	Deputy Emergency Management Coordinator	General Policy Guidance
City of Frisco	Emergency Management Analyst	Coordination / Information Gathering / Submittals
City of Frisco	Public Safety GIS	Information Support

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.

- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Frisco Independent School District	Director of Emergency Management	Review of plan
Centennial Medical Center	Director of Emergency Management	Review of plan
Baylor Medical Center of Frisco	Director of Emergency Management	Review of plan
American Red Cross	Collin County VOAD Member	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a Coordinating Committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the planning committee met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdictions' participation:

- Collin County Kickoff Meeting – August 12, 2020
- Collin County HazMAP Planning Meeting – Week of 11/05/2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring

communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Frisco identified several natural hazards and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Chapter 3 of this update. This was done after reviewing the 2016 Collin County HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the City of Frisco and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Frisco

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	1	0	0	0.35
Drought	2	0	0	3	0.9
Earthquake	0	1	0	1	0.45
Expansive Soils	3	0	0	2	1.1
Extreme Heat	2	0	0	3	0.9
Flooding	1	1	0	1	0.75
Hail	2	1	1	3	1.5
High Winds	2	1	1	3	1.5
Lightning	2	1	1	3	1.5
Tornado	2	1	1	3	1.5
Wildfire	1	0	0	0	0.3
Winter Storms	2	0	1	3	1.15

The conclusions drawn from the hazard profiling process for the City of Frisco, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Frisco.

Table 3.3 Hazard Rankings for the City of Frisco

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Hail High Winds Lightning Tornado Winter Storms Expansive Soils Earthquake
Low Risk (PRI 0.50 – 1)	Drought Extreme heat Flooding
Negligible to No Risk (PRI 0 – 0.49)	Dam Failure Wildfire

Changes in Development and Priorities (Requirement §201.6(d)(3))

Since 2011, the City of Frisco has seen tremendous growth both in population and development. The population in 2011 was 119,738; it is now 203,795. Frisco Independent School District grew from 37,300 students to over 60,000 students across 10 high school,17 middles schools and 42 elementary schools. Commercial permits issued each year continues to rise; in 2014 we issued 85 new permits and in 2020 we issued 82 permits. Housing permits are estimated to have increased 15% from 2019 with the city issuing 7,399 single family and multi family dwelling permits. The Fire Department has added an additional two stations within this timeframe. Frisco is home to five large capacity special event venues, which host a variety of sporting and special events including the NFL Dallas Cowboys Headquarters and Training facility, NCAA Division I Finals, Major League Soccer, Minor League Baseball, basketball, and hockey as well as a variety of concerts. Frisco will also be home to the Professional Golf Association (PGA) in the coming year. It is not uncommon to have events occurring simultaneously at all five venues, effectively bringing an additional 20,000 to 30,000 visitors into the city within a matter of hours. Yearly the City of Frisco hosts approximately 6.6 million visitors. These increases alter the city's vulnerabilities to natural hazards by not only adding more citizens, more visitors and more infrastructure but also major commercial development. The City of Frisco was a participating jurisdiction in the 2016 Collin County Hazard Mitigation Action Plan. Since then, Frisco has completed several of their original action items, in an effort to lower vulnerability on populations and property from natural hazards. The following actions, sorted by type of action, have had a direct impact on lowering vulnerability:

- Natural Systems Protection
  - Develop and implement system for ensuring maintenance of utility infrastructure in easement right-of-ways are clear of obstructions to include excessive tree/brush growth.
  - Establish water systems to handle increased rates and volumes of runoff from new developments.
- Local Rules and Regulations
  - Compliance with the NFIP through enforcement of local floodplain ordinances.
- Education and Awareness Projects
  - Expanding early warning sirens and local warning system to notify the public of impending severe weather and reduce the loss of life and mitigate the effects of the hazards.

The development and implementation of these projects have directly led to lower vulnerability for residents and property located in Frisco. It should be noted that, although these action items, have been completed, these action items may continue to be necessary to reduce vulnerability in the future.

New priorities are noted and ranked in each new action item, Section 6. Except for actions completes or cancelled, other priorities remain the same as in the previous version of this plan.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Frisco faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure This hazard was identified as having negligible to no risk to the City of Frisco, but as a participant in the county plan inundation studies will be considered.

Drought This hazard was identified as having low risk to the City of Frisco. Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Frisco are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Frisco and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake This hazard was identified as having moderate risk to the City of Frisco. All populations and property have the potential to be vulnerable to earthquake. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils The City of Frisco has building requirements for the design and engineering of foundations based on the soils. All populations and property have the potential to be vulnerable to expansive soils, especially those constructed under older building codes.

Extreme Heat This hazard was identified as having low risk to the City of Frisco. All geographic areas have the potential to be vulnerable to extreme heat. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding This hazard was identified as having low risk to the City of Frisco. Flood events often occur on neighborhood streets, and in one instance in 2007 the Collin County Health Department flooded.

Hail All geographic areas, property, and populations in the City of Frisco have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable. It is common for roofs of houses and vehicles to suffer damage from the occasional hail storm. Most citizens carry insurance that covers these damages.

High Winds All geographic areas in the City of Frisco have the potential to be vulnerable to high winds; however, manufactured homes and exposed populations are most vulnerable. It is common for fences and trees to suffer damage from the occasional high wind storm. Most citizens carry insurance that covers these damages. The city participates in public education and public alerting for high wind scenarios. High Winds also contribute to debris removal. The city has a storm management plan that addresses debris removal.

Lightning All geographic areas, property, and populations in the planning area have the potential to be vulnerable to lightning. This hazard was identified as having moderate risk to the City of Frisco. Property without lightning protection and exposed populations are most vulnerable.

Tornado The City of Frisco is within "tornado alley." Although the city has not experienced a devastating tornado, there is the potential for one. The City of Frisco has one manufactured home park in the center of the City that would be severely impacted by a tornado.

Wildland Fire This hazard was identified as having low to no risk to the City of Frisco. 32.75% of the population is vulnerable to the WUI.

Winter Storms The city has three major highways, State Hwy 121, US 380, and the Dallas North Tollway. All of these can be impacted during winter storms. These highways give access to and from our critical infrastructure including our receiving hospital and fire and police stations. Winter storms also contribute to debris removal. The City has a storm management plan that addresses debris removal. The homeless, elderly, and populations without access to heat are most vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of the City of Frisco's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County as delineated by U.S. Census 2010 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities

was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates and the US Census Bureau, the total population of Frisco in 2019 was 200,490 people, with 31,334 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4 Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
Frisco	200,490	19.38%	2,897.67	31,334	10.71%	452.87

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Frisco).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Frisco	116,989	171,960	182,580	10,620	6.18%

Source 2020 NCTCOG Population Estimate

Property

There are an estimated 40,956 parcels in the City of Frisco, making up $17,625,127,264 of the parcels in Collin County. *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Frisco (Collin County)	40,956	10.46%	$17,625,127,264
Frisco (Denton County)	27,676	7.35%	$10,008,823,511
Frisco Total	68,632		$27,633,950,775

Table 3.6 Parcel Counts and Improvements Value

Source: Collin County Appraisal District

[1]Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There are sixteen identified emergency facilities in the City of Frisco, including nine fire stations, one police station, and six hospitals.

Table 3.7 presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Frisco	9	1	6

Source: Local data

Critical Facilities

There are 157 critical facilities, which are considered non-emergency in the City of Frisco. The critical facilities include 95 schools and twenty-nine (29) historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Number
Frisco ISD	89 (includes other FISD facilities)
Private Schools	6
Senior Living, Assisted Living, Nursing Homes	30
Dialysis Centers	3
Historic Sites	29

Source: Local jurisdictions

Critical Infrastructure

There are forty-one (41) identified critical infrastructure facilities in the City of Frisco, including, two (2) wastewater treatment facilities, two (2) dams, and thirty-eight (38) railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Frisco	0	0	2	0	2	38

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Frisco's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Frisco, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.9* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			x
Drought	x		
Earthquake			x
Expansive Soils			x
Extreme Heat		x	
Flooding	x		
Hail	x		
High Winds		x	
Lightning		x	
Tornado		x	
Wildfire	x		
Winter Storms		x	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Frisco are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Frisco. The City of Frisco and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to developed areas and the improved property in the City of Frisco is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to buildings and the emergency facilities in the City of Frisco are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to buildings, and the critical facilities in the City of Frisco are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is zero (0) impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Frisco.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero fatalities and injuries per year. Approximately 1.56% of the population of the City of Frisco is located within the 100-year floodplain.
Improved Property	There have been three (3) recorded flood events in the City of Frisco. Property losses are at $16,666.67 per year. No crop losses are expected or recorded county-wide. Approximately 0% of the total assessed value of improvements in the City of Frisco is at risk from the 100-year floodplain.
Emergency Facilities	There are 0 emergency facilities located within the 100-year floodplain.
Critical Facilities	There are 0 critical facilities located within the 100-year floodplain.
Critical Infrastructure	0 railways/highways and bridges, 0 dams, 1 water treatment plant and 1 water storage tank are at risk from the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected at $89,914.28 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Frisco indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Frisco are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Frisco are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Frisco are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Frisco is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected at $4,200 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Frisco.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Frisco are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Frisco are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Frisco are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in the City of Frisco. All the population of the City of Frisco is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected at $25,916.67 per year however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Frisco are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Frisco are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Frisco are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Frisco. All the population of the City of Frisco is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Frisco are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Frisco are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Frisco are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 32.75% of the City of Frisco is vulnerable to wildfires, with the City of Frisco and the unincorporated areas contributing with the majority of the exposed population. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are expected but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Frisco are also unknown.
Emergency Facilities	Based on geographic information there are 0 fire stations in the City of Frisco at risk from wildfire events.
Critical Facilities	Based on geographic information there are 0 schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facilities, and 0 water treatment facilities at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Frisco. All the population of the City of Frisco is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Frisco are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Frisco County.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Frisco are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Frisco are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Frisco are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Frisco considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities														
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**% Yes per Jurisdiction**
City of Frisco	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	**93%**
Average % Yes Capabilities – 93%														
Y- Yes N- No ?- Don't Know														

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Frisco	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	**100%**
Average % Yes Capabilities – 100%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities										
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas Other	% Yes
City of Frisco	Y	Y	Y	Y	Y	Y	Y	Y	Y	**100%**
Average % Yes Capabilities – 100%										
Y- Yes N- No ?- Don't Know										

To quantify the city of Frisco's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the city of Frisco and its jurisdictions have 93% of identified legal and regulatory capabilities, 100% of identified administrative and technical capabilities, and 100% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Frisco	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions, expand, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Frisco Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within the City of Frisco.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Frisco Action Items: Deferred from 2016 Plan

City of Frisco Action Item	Expanding the Early Warning Sirens and Local Warning System to notify new populations of impending severe weather or imminent hazards to reduce the loss of life and mitigate the effects of the hazards.
Hazard(s) Addressed	Tornado, hail, high winds, lightning, wildfire
Goal/Objective	1-B
Priority	High
Estimated Cost	$40,000 - $50,000 each siren / total to be determined
Potential Funding Sources	City of Frisco annual budget, HMGP
Lead Department	Fire Department
Implementation Schedule	2-5 years
Effect on Old Buildings	Outdoor warning sirens do not have an impact on structures; they are designed to be heard outdoors only.
Effect on New Buildings	The outdoor warning sirens do not have an impact on structures; they are designed to be heard outdoors only.
Cost Effectiveness	The costs associated with maintaining an outdoor warning system are minimal and less expensive than total replacement of an outdoor warning system.
Discussion	The outdoor warning siren system is the most effective tool for outdoor notification, especially as relative to the fact that Frisco has many outdoor parks, trails, and nature areas that are used by citizens.

City of Frisco Action Item	Implement the Texas Individual Tornado Safe Room Rebate Program Locally

Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	Medium
Estimated Cost	50% of cost (up to) $3,000 per shelter. Number of shelters to be determined
Potential Funding Sources	County Budget, HMGP, PDM, Homeowner, Work-in-kind
Lead Department	Building Inspections Department, Emergency Management, HMC
Implementation Schedule	2-5 years
Effect on Old Buildings	This action will improve the safety of existing homes with either in-ground or in-house shelters.
Effect on New Buildings	This action will improve the safety of new homes with either in-ground or in-house shelters.
Cost Effectiveness	The cost of this project is low compared to the potential benefits of reduction in personal injuries and/or deaths.
Discussion	Residential safe room sheltering can decrease potential personal injuries or deaths in the event of a tornado.

City of Frisco Action Items: New

City of Frisco Action Item	Emergency power generators to provide life safety due to power outages caused by natural hazards.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$100,000- $1.2M each
Potential Funding Sources	Local funds, Federal grants, state grants
Potential Matching Sources	Local funds, donations, in kind
Lead Department	Emergency Management, Facilities, Public Works
Implementation Schedule	0-5 years
Effect on Old Buildings	Any old buildings would meet building construction standards.
Effect on New Buildings	New structures would have standards for construction
Cost Effectiveness	Medium-High, Relative
Discussion	Frisco will install, upgrade, and/or replace generators for critical facilities, including fire stations, City Hall, the Police Department, Public Works, water/wastewater pump and lift stations, shelter sites, and any facility that is essential to maintain city services.

City of Frisco Action Item	Harden existing critical facilities to protect against natural hazard damage.

Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$20,000- $150,000 each
Potential Funding Sources	Local funds, Federal grants, state grants
Potential Matching Sources	Local funds, donations, in kind
Lead Department	Engineering
Implementation Schedule	2-5 years
Effect on Old Buildings	Old buildings protected against damage from natural hazards
Effect on New Buildings	New structures would have standards for construction
Cost Effectiveness	Medium-High, Relative
Discussion	Frisco will harden critical infrastructure through mitigation by use of tornado, wind, fire, hail, ground movement, and impact resistant materials (windows, doors, roofing, construction, siding, roof bracings); dry-proofing buildings; upgrading to higher standard insulation; installing lightning rods and grounding systems; retrofitting for low-flow plumbing; replacing landscaping with drought and fire resistant plants; implementing higher standards for foundations. This includes hail-resistant covered parking for city facilities.

City of Frisco Action Item	Identify and implement building standards to reduce or avert expansive-soils damages and losses to structures and infrastructure, with emphasis on critical facilities and utilities.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000 - $15,000
Potential Funding Sources	Private
Potential Matching Sources	None
Lead Department	Engineering
Implementation Schedule	2-5 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	New standards for constructing buildings to defend against expansive soils
Cost Effectiveness	Relative

Discussion	Building standards will keep buildings from being built in expansive soil troubled areas.

City of Frisco Action Item	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B
Priority	High
Estimated Cost	$5,000 - $10,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Frisco Action Item	Add all-directional sirens and solar panels to the outdoor warning system to notify the public of impending severe weather.
Hazard(s) Addressed	Tornado, High Winds, Hail, Lightning, Flooding
Goal/Objective	1-A, 1-B, 2-D
Priority	High
Estimated Cost	$200,000 - $300,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Cost is minimal compared to possibility of injury

Discussion	All directional sirens would multiply the area of effect for the outdoor warning system. Solar panels would add a level of resiliency by protecting the sirens against power outages that can accompany severe weather. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Frisco Action Item	Implement seasonal trimming/removal of trees along utility and road corridors, preventing potential winter storm damage.
Hazard(s) Addressed	Winter Storms
Goal/Objective	3-C
Priority	High
Estimated Cost	$10,000 - $15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Public Works
Implementation Schedule	2-5 years
Effect on Old Buildings	Reduce potential for debris/limb damages during severe weather
Effect on New Buildings	Reduce potential for debris/limb damages during severe weather
Cost Effectiveness	Cost is minimal compared to possibility of injury
Discussion	Separate from regular maintenance, this program would identify high-hazard areas adjacent to roadways or utility areas and target those locations for abatement measures, including, but not limited to, tree trimming and/or removal.

City of Frisco Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones

Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Frisco Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Frisco Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.

Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Frisco Action Item	Update Frisco's Drought Contingency & Water Emergency Response Plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds; in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify needs for retrofits, such as low flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing
Cost Effectiveness	Low cost for effective means of preserving water resources
Discussion	Develop a plan for conversing water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

National Flood Insurance Program (NFIP) Compliance

Frisco is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

Collin County							
Communities Participating in the National Flood Program							
CID	**Community Name**	**County**	**Initial FHBM Identified**	**Initial FIRM Identified**	**Curr Eff Map Date**	**Reg-Emer Date**	**Tribal**
480134#	FRISCO, CITY OF	DENTON COUNTY/COLLIN COUNTY	1/24/1975	6/18/1980	4/18/2011	6/18/1980	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Community Floodplain Administrator	NFIP Activities	Activity Description	Enforcement
Senior Stormwater Engineer	Require permits for all proposed construction or other development in the community.	Permits are issued through the Development Services or Engineering Department.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval.
	Review proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law.		
	Review all permit applications to determine whether proposed buildings site will be reasonably safe from flooding.		
	Review subdivision proposals and other proposed developments to determine whether such proposals will be reasonably safe from flooding.		

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the City of Frisco has developed a plan maintenance process which is described in the following paragraphs. The City of Frisco, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Frisco, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The City of Frisco Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Frisco will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Emergency Management Analyst	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdictions, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

2011 Plan Incorporation: Collin County's 2011 mitigation plan was incorporated into Frisco's fire codes and building codes through code updates (2012), as appropriate and planned in the 2011 HazMAP.

2016 Plan Incorporation: The vulnerability and capabilities assessments for each jurisdiction were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into existing local planning strategies and mechanisms. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Frisco	Emergency Management Analyst	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
		Emergency Operations Plan updates	Triennially	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Frisco Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex I: City of Josephine

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Josephine participated in the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the City of Josephine. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Josephine. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Josephine has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Josephine officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
Nationals Centers of Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Josephine Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating county jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. The efforts of the planning committees and the HMPT were led by the Collin County Assistant Emergency Management Coordinator. The table below provides a list of the primary representatives on the Josephine planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Josephine City Council	Mayor	Plan Development
Josephine Police Department	Police Chief	Plan Development
Josephine Fire Department	Assistant Fire Chief	Plan Development Coordinator
Engineering	City Engineer	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.

- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Josephine Economic Development Committee	Committee Secretary	Review of plan
Josephine Food Bank	Food Bank Coordinator	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Collin County Kickoff Meeting – August 12, 2020
- Collin County HazMAP Planning Meeting – Week of 11/05/2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022TBD at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Josephine identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the city of Josephine and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%		Minor	Very few injuries, if at all none	0

	Life Impact	Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Josephine

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	0	0.65
Hail	2	0	0	1	0.7
High Winds	1	0	1	1	0.65
Lightning	1	0	0	0	0.3
Tornado	2	1	1	2	1.4
Wildfire	1	2	0	1	1.1

Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for the City of Josephine, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Josephine.

Table 3.3 Hazard Ranking for the City of Josephine

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Winter Storms Drought Wildfire
Low Risk (PRI 0.50 – 1)	Extreme Heat Expansive Soils Hail High Winds
Negligible to No Risk (PRI 0 – 0.49)	Earthquake Flooding Lightning Dam Failure

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Josephine faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation in this plan.

Dam and Levee Failure This hazard was identified as having negligible to no risk to the city of Josephine because there are no dams within the city Limits. There are dams to the north west of the city, therefore as a participant in the county plan inundation studies will be considered.

Drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Josephine are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma,

Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Josephine and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils Although expansive soils are prevalent throughout Collin County, this hazard is considered a low risk to the City of Josephine. All property has the potential to be vulnerable to expansive soils, especially those constructed under older building codes.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding There is a history of minor flooding at FM 1777 and FM6 that obstructs the roadway. Flooding around city hall occurs during heavy rainfall events, roughly an estimated 1-2 times per year. Roadway at Main and Swanson is obstructed from minor flooding.

Hail All geographic areas, property, and populations in Josephine have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds All geographic areas of Josephine have the potential to be vulnerable to high winds; however, due to Josephine's geography (flat, open area), manufactured homes and exposed populations are most vulnerable.

Lightning All geographic areas, property, and populations in Josephine have the potential to be vulnerable to lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado Residents on the northwest side of Josephine are most vulnerable to tornados. Many of the houses are manufactured homes whose residents, due to the secluded nature of the area, may be unable to reach shelter quickly.

Wildland Fire 51.41% of the city is in the WUI; therefore, most, if not all, areas, property, and population of Josephine are vulnerable to wildfire.

Winter Storms Winter storms are a significant threat to the City of Josephine. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. Josephine residents live a distance from stores and may be unable to buy supplies in the event of a prolonged storm.

Identification of Assets and Vulnerability Assessment

An inventory of the City of Josephine geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
  Critical infrastructure: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates, the total population of the City of Josephine in 2020 was 1,966 people, with 695 households. The count breakdown by is provided in *Table 3.4.*

Table 3.4. The City of Josephine Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
Josephine	1,966	0.18%	1127.68	702	0.24%	397.07

Source: 2020 NCTCOG Population Estimate & Collin County Appraisal District
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Josephine).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Josephine	812	1450	1550	100	6.89%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 993 parcels in the City of Josephine, with an estimated $102,041,382 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Josephine	993	0.20%	$102,041,382

Source: Collin County Appraisal District
[1]Includes public buildings (residential, commercial, industrial, agricultural, religion, government, education)

Emergency Facilities

There are 2 identified emergency facilities in the City of Josephine, including 1 fire station, 1 police station, and 0 hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Josephine	1	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are six critical facilities, which are considered non-emergency in the City of Josephine. The critical facilities include 0 schools and six historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Josephine	0	6

Source: Local jurisdictions

Critical Infrastructure

There are 5 identified critical infrastructure facilities in the City of Josephine, including 0 airports, 0 natural gas facilities, 1 water treatment facilities, 0 wastewater treatment facilities, 0 dams, and 4 railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Josephine	0	0	0	1	0	4

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Josephine's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Josephine, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	

Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Josephine are expected mostly during water shortages, financially unknown due to lack of accurate reporting .
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were four (4) county-wide fatalities recorded due to extreme heat, none from the City of Josephine. The City of Josephine and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Josephine is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Josephine are not vulnerable to this hazard.

Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Josephine are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Josephine.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 92 residential parcels in the City of Josephine are located within the 100-year floodplain.
Improved Property	There have been zero (0) recorded flood events in the City of Josephine. Property losses are expected but unknown due to inaccurate reporting. No crop losses are expected or recorded county-wide. Approximately $4,467,551 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but unknown due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Josephine indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Josephine are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Josephine are vulnerable to this hazard.

Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Josephine are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population in the City of Josephine are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but unknown due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Josephine.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Josephine are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Josephine are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Josephine are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in the City of Josephine. All the population in the City of Josephine are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Josephine are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Josephine are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Josephine are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Josephine. All the population of Josephine is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Josephine.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Josephine are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Josephine are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Josephine are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 51.41% of the City of Josephine is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Josephine are also unknown.
Emergency Facilities	Based on geographic information there are 0 fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facilities, and 0 water treatment facilities at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Josephine. All the population of the City of Josephine are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Josephine are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Josephine.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Josephine are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Josephine are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Josephine are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Josephine considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
City of Josephine	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	N	Y	N	61%
Average % Yes Capabilities – 61%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes per Jurisdiction
City of Josephine	Y	Y	Y	Y	Y	Y	N	N	N	N	60%
Average % Yes Capabilities – %											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
City of Josephine	Y	Y	Y	Y	Y	Y	Y	Y	N	N	90%
Average % Yes Capabilities – %											
Y- Yes N- No ?- Don't Know											

To quantify Josephine's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, Josephine has 61% of identified legal and regulatory capabilities, 60% of identified administrative and technical capabilities, and 90% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Josephine	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Josephine Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within City of Josephine.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Josephine Action Items: Deferred from 2016 Plan

City of Josephine Action Item	Develop and implement a comprehensive public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Winter Storm, Drought, Extreme Heat, Flooding, Wildfire, Expansive Soils, Hail, Earthquake, High Winds, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Josephine identified. The program would use a combination of distributed literature, social media, and civic

	presentations to educate residents on natural hazards and promote hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Josephine Action Item	Identify and establish heating and cooling centers for vulnerable populations
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Establishing heat and cooling shelters would allow special populations to reduce their vulnerability to extreme heat and cold
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.

Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Josephine Action Item	Increase outdoor warning siren coverage for new development areas
Hazard(s) Addressed	Dam Failure, High Winds, Tornado, Wildfire, Hail, Flooding, Lightning
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren. Number of sirens TBD.
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, donations
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand Josephine's siren coverage to new areas of development not currently protect by sirens.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones

Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP will Identify all structures and infrastructures that would be impacted by a potential wildfire, and identify potential targeted mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Develop, adopt, and enforce water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing

Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	City of Josephine will develop, adopt, and enforce water conservation ordinances, codes, and other regulatory measures to conserve water during times of drought.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.

Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Josephine Action Items: New

City of Josephine Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium

Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Josephine Action Item	Identify and establish heating and cooling centers for vulnerable populations
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Establishing heat and cooling shelters would allow special populations to reduce their vulnerability to extreme heat and cold

City of Josephine Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter

Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.

City of Josephine Action Item	Increase outdoor warning siren coverage for new development areas
Hazard(s) Addressed	High Winds, Tornado, Wildfire, Hail, Flooding, Lightning
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren. Number of sirens TBD.
Potential Funding Sources	General Fund, HMGP, PDM
Potential Matching Sources	Local funds, in-kind, donations
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand Josephine's siren coverage to new areas of development not currently protect by sirens. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Josephine Action Item	Develop and implement a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants

Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	A CWPP will Identify all structures and infrastructures that would be impacted by a potential wildfire, and identify potential targeted mitigation projects.

City of Josephine Action Item	Develop, adopt, and enforce water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	City of Josephine will develop, adopt, and enforce water conservation ordinances, codes, and other regulatory measures to conserve water during times of drought. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Josephine Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake

Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Josephine Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Josephine Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Drought, Earthquake, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High

Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as other emergency and hazard information

National Flood Insurance Program (NFIP) Compliance

Josephine is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480756#	JOSEPHINE, CITY OF	HUNT COUNTY/COLLIN COUNTY	05/28/76	01/02/80	01/06/12	12/15/95	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Manager	NFIP Activity	Activity Description	Enforcement
City of Josephine	City Secretary	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through City Hall. City of Josephine requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Any person who violates this article or fails to comply with any of its requirements shall upon conviction thereof be fined in accordance with the general penalty found in section 1.01.009 of this code per violation, and in addition shall pay all costs and expenses involved in the case. Each day a
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Future Mitigation Projects	City of Josephine will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

				violation occurs is a separate offense.

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Josephine, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Josephine will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Time
Police Chief	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation

action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Josephine	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Police Chief	Emergency Action Plan updates	Annually	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
	Planning Director, City Council	Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Josephine Hazard Mitigation Planning Team considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex J: City of Lavon



1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. This plan updates the Lavon hazard mitigation plan submitted to FEMA as part of the 2016 Collin County plan. The City of Lavon participated on the Collin County Hazard Mitigation Planning Team (HMPT) for this update. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Lavon. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Lavon has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Lavon officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Lavon Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT. The efforts of the planning committee were coordinated with the HMPT by the Collin County Assistant Emergency Management Coordinator; the City of Lavon acted as the plan development consultant providing hazard mitigation planning services.

The Collin County HMPT was assembled in 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. The table below provides a list of the primary representatives on the Lavon planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Fire Department	Fire Chief	Plan Development
City Council	Councilmember	Plan Development
City Council	Mayor	Plan Development
Police Department	Police Chief	Plan Development
Public Works	Director of Public Works	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.

- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Community ISD	School Board Member	Review of plan
North Texas Municipal Water District	Board Member	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The City of Lavon was provided the plan for update on 8/18/2020 and provided input and updates on April 30, 2021. The city provided updates that included information from multiple departments within the city including council and the fire department.

The following meetings were held by Collin County:

- Collin County Kickoff Meeting – August 12, 2020
- Collin County HazMAP Planning Meeting – Week of 11/05/2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Lavon identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the city of Lavon and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Lavon

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	1	0	0.25
Drought	2	0	0	3	0.9
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	2	1	0	2	1.15
Flooding	1	1	0	1	0.75
Hail	2	0	0	1	0.7
High Winds	2	0	0	2	0.8
Lightning	1	0	0	0	0.3
Tornado	2	2	2	2	2
Wildfire	2	1	2	2	1.65
Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for the City of Lavon, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Lavon.

Table 3.3 Hazard Rankings for City of Lavon

High Risk (PRI 2 - 3)	Tornado
Moderate Risk (PRI 1.01 -1.9)	Wildfire Winter Storms Extreme Heat
Low Risk (PRI 0.50 – 1)	High Winds Flooding Expansive Soils Hail Drought
Negligible to No Risk (PRI 0 – 0.49)	Earthquake Lightning Dam Failure

Changes in Development and Priorities (Requirement §201.6(d)(3))

In terms of physical development for the City of Lavon, based on 2020 Census estimates the population of Lavon increased 100%, from 2,219 to 4,469. Housing units increased from approximately 775 to 1500.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Lavon faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation in this plan.

Dam and Levee Failure The City of Lavon is not subject to dam failure because no Dams are located inside the city limits and the city is not vulnerable to a Dam failure that might occur outside the city limits, but as a participant in the county plan inundation studies will be considered.

Drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Lavon are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Lavon and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity. However, this hazard was identified as having negligible or no risk to the City of Lavon.

Expansive Soils All property has the potential to be affected by expansive soils, especially those constructed under older building codes.

Extreme Heat The entire population has the potential to be vulnerable to extreme heat. The homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding There are several undersized culverts that need to be upgraded. This makes the City of Lavon at risk for flooding.

Hail The entire geographic planning area, properties, and populations have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds The entire geographic planning area has the potential to be vulnerable to high winds. Significant vegetative debris generated during high wind events requires removal to keep roads passable. Manufactured homes and exposed populations are most vulnerable.

Lightning All geographic areas, property, and populations in Josephine have the potential to be vulnerable to lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. The

City of Lavon is at low risk for lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado The entire geographic planning area has the potential to be vulnerable to tornadoes, with manufactured home populations being most vulnerable.

Wildland Fire All geographic areas in Lavon are susceptible to wildfire, with the most vulnerable structures and populations located in the WUI. 52.46% of the city's population lives in the Wildland Urban Interface, and this area is at a high level of risk according to the Texas Forest Service Wildfire Risk Assessment Summary.

Winter Storms The entire geographic area of Lavon has the potential to be vulnerable to winter storms, with the homeless, elderly, and populations without access to heat being most vulnerable. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time.

Identification of Assets and Vulnerability Assessment

An inventory of the City of Lavon geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Predictions, the total population of the City of Lavon in 2020 was 4,102 people, with 1,610 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Lavon	4,210	0.38%	1354.24	1,500	0.38%	454.55

Source: 2020 NCTCOG Population Estimate & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Lavon).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Lavon	2,219	3,750	4,090	340	9.07%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 2,458 parcels in the City of Lavon, with an estimated $362,865,134 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Lavon	2,458	0.26%	$362,865,134

Source: Collin County Appraisal District 7-2021

Emergency Facilities

There is one identified emergency facility in the City of Lavon, including one fire station, one police station, and no hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Number of Fire Stations	Number of Police Stations	Number of Hospitals
City of Lavon	1	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There is one critical facility, which are considered non-emergency in the City of Lavon. The critical facilities include one school and two historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Lavon	1	2

Source: Local jurisdictions

Critical Infrastructure

There are 4 identified critical infrastructure facilities in the City of Lavon, including no airports, no natural gas facilities, no water treatment facilities, one wastewater treatment facilities, no dams, and 3 railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Lavon	0	0	1	0	0	3

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Lavon's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Lavon, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding

these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Lavon are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.

Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Lavon. The City of Lavon and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is little impact of extreme heat to developed areas and the improved property in City of Lavon is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is little impact of extreme heat to buildings and the emergency facilities in City of Lavon are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is little impact of extreme heat to buildings, and the critical facilities in City of Lavon are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is little impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in City of Lavon

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 14 residential parcels in the City of Lavon are located within the 100-year floodplain.
Improved Property	There have been four (4) recorded flood events in the City of Lavon. Property losses are expected but unknown due to inaccurate reporting. No crop losses are expected or recorded county-wide. Approximately $259,195 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be at risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be at risk in the 100-year storm event.

Critical Infrastructure	Critical Infrastructure have the potential to be at risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected at $7,142.86 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for City of Lavon indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in City of Lavon are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in City of Lavon are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in City of Lavon are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are one (1) recorded injury and no recorded fatalities from high wind events. All the population of City of Lavon is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected at $628.57 per year however these values are underestimated due to lack of accurate reporting. No in crop losses resulted from this hazard in City of Lavon.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in City of Lavon are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in City of Lavon are vulnerable to this hazard.

Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in City of Lavon are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in City of Lavon. All the population of City of Lavon is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected at $2,083.33 per year however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in City of Lavon are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in City of Lavon are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in City of Lavon are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in City of Lavon. All the population of City of Lavon is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in City of Lavon are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in City of Lavon are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in City of Lavon are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 52.46% of City of Lavon is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Lavon are also unknown.
Emergency Facilities	Based on geographic information there are 1 fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facility, and 0 water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Lavon. All the population of City of Lavon exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lavon are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in City of Lavon.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in City of Lavon are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in City of Lavon are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in City of Lavon are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, Lavon considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities														
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
City of Lavon	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	?	**76%**
Average % Yes Capabilities – 76%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Lavon	Y	Y	Y	Y	N	N	N	N	Y	Y	**60%**
Average % Yes Capabilities – 60%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
City of Lavon	Y	Y	Y	Y	Y	Y	Y	N	N	?	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify Lavon's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, Lavon has 76% of identified legal and regulatory capabilities, 60% of identified administrative and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Lavon	Mayor	The city council, including the mayor, mayor pro-tem, and council members, along with the department heads, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2021 HazMAP, the City of Lavon Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Expand adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Lavon.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Lavon Action Items: Modified from 2016 Plan

Lavon Action Item	Employ an automated alert system to broadcast weather conditions, hazards and road closures. Also will allow for broadcast of watches, warnings, evacuation routes, shelter information, and mitigation information.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$3,000
Potential Funding Sources	City Budget
Lead Department	City Manager's Office
Implementation Schedule	Done
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	This project's cost effectiveness is in the lives it saves by alerting citizens to take shelter during extreme weather conditions.
Discussion	The automated alert system will reduce the threats to the citizens by alerting them to impending severe weather and warn citizens to seek appropriate shelter inside.
Status	Completed

Lavon Action Item	Reduce the impact of Severe Heat by utilizing Green Landscaping Roofing on all new city construction.

Hazard(s) Addressed	Extreme Heat
Goal/Objective	2-B, 2-D
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	Local funding, HMGP
Lead Department	Public Works
Implementation Schedule	1-5 years
Effect on Old Buildings	No effect
Effect on New Buildings	The green landscaping will reduce overall effect of extreme heat on buildings, making cooling more efficient and reducing the use of electricity as well as reducing the effects of extreme summer heat on the citizens.
Cost Effectiveness	This project is cost effective in the reduction of hazards to citizens as well as the reduced power and electricity requirements for cooling buildings in summer heat.
Discussion	By utilizing landscaping on the roofs several significant benefits will be utilized. Including, insulation in the facility reducing the need for electricity, reducing the impact of extreme heat on the residents.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Develop and implement a Master Storm Water Drainage Plan for the City.
Hazard(s) Addressed	Flooding
Goal/Objective	2-E
Priority	High
Estimated Cost	$50,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	1-5 years
Effect on Old Buildings	Improved planning reduces potential flooding impacts
Effect on New Buildings	Mitigates flooding impacts
Cost Effectiveness	This project is extremely cost effective when compared to the property and agriculture/crop damage that will be avoided once the Master Storm Drainage plan enactment begins.
Discussion	There is a Storm Sewer Map currently, but no Master Storm Drainage Plan. By preparing and implementing this plan, it will reduce the occurrence of flash flooding and sudden inundation of areas. It will improve transportation during severe weather. Reduce vulnerabilities to those homeowners who are located in areas outside of flood zones but vulnerable to overflow flooding. And eliminate the rerouting of storm water to unattended areas.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Implement Building Codes requiring New Commercial Facilities to utilize Hail Resistant Roofing Materials to the extent allowed by State law..
Hazard(s) Addressed	Hail
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$5,000-$10,000
Potential Funding Sources	HMGP, Local budget
Lead Department	Emergency Management
Implementation Schedule	1-5 years
Effect on Old Buildings	Hail resistant roofing and window coverings will significantly mitigate the potential hazards of property damage as well as possible personal injury due to severe storm and hail.
Effect on New Buildings	Reduce impacts of hail on new structures
Cost Effectiveness	The cost effectiveness of the project will be the reduction of damage to property as well as reducing the need for debris disposal after a storm.
Discussion	The City of Lavon will enact codes for new development and city construction by requiring developers to install hail resistant roofing and window coverings, thus reducing the effect of severe weather and damage.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Retrofit an existing structure or construct a new City Hall built to withstand an EF2 Tornado.
Hazard(s) Addressed	Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	$5,000,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	5-10 years
Effect on Old Buildings	No effect on existing buildings unless retrofit
Effect on New Buildings	This would affect the new City Hall building, making it able to withstand an EF2 tornado, mitigating the loss of such critical infrastructure.
Cost Effectiveness	This project is cost effective because the current City Hall building is a renovated historic structure and will not withstand an EF2 tornado. City Hall houses many functions, documents, and records, and the potential loss of those greatly outweighs the cost of a new hardened structure.
Discussion	The current City Hall houses Administration and Finance, Development Services, Building Inspection and Permitting, , Municipal Court and City

	Council Chambers, PW, community meeting rooms, gymnasium and all the records are housed. The City Hall facility is a historic structure. The construction or retrofit of the new City Hall should include a hardened infrastructure to withstand known hazard extent levels.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Retrofit an existing structure or construct a new Public Works office and shop built to withstand a EF2 Tornado
Hazard(s) Addressed	Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	$1,000,000
Potential Funding Sources	City Budget, Grant Programs
Lead Department	Department of Public Works
Implementation Schedule	2-4 years
Effect on Old Buildings	No effect on existing buildings unless retrofit
Effect on New Buildings	This would affect the new Public Works office and shop buildings, making them able to withstand an EF2 tornado, mitigating the loss of such critical infrastructure and protecting critical equipment.
Cost Effectiveness	This project is cost effective because the current Public Works building will not withstand an EF2 tornado. The building houses many functions, documents, operations equipment, heavy equipment, and records, and the potential loss of those greatly outweighs the cost of a new hardened structure.
Discussion	The current Public Works building contain operations and heavy equipment. The building would not withstand an EF2 tornado. In order to mitigate the effects of that hazard, the retrofit or construction of the new Public Works office and shop should include a hardened infrastructure to withstand known hazard extent levels.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Implement a program to inspect and clear excessive brush along high-voltage power lines and surrounding land, reducing the vulnerability to citizens located in potential wildland fire areas.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	2-C
Priority	High
Estimated Cost	$500,000/year
Potential Funding Sources	Local funding, HMGP
Lead Department	Public Works, Fire Department
Implementation Schedule	1-2 years

Effect on Old Buildings	This would mitigate the effects of wildland fire encroaching upon built up areas for existing construction.
Effect on New Buildings	This would mitigate the effects of wildland fire encroaching upon built up areas for new structures.
Cost Effectiveness	This project's cost effectiveness is seen in the management of wildland fire fuels to significantly reduce the damage or loss of buildings, structures, agriculture products, or homes to wildland fire.
Discussion	Currently the City of Lavon is susceptible to wildland fires due to the large amounts of family owned and un-maintained land along with the large farming industry. With the clearing of brush around high power voltage lines and surrounding land, this will create a fire break, greatly reducing the hazard and risks associated with possible ignition sources of wildland fire.
Status	Deferred – included in 2021 Action Items

Lavon Action Item	Develop and implement a community awareness program utilizing the City's existing communication outlets including the website, social media, and newsletter in order to mitigate the effects of wildland fire.
Hazard(s) Addressed	Wildland Fire
Goal/Objective	4-A, 4-B
Priority	High
Estimated Cost	$7,000-$10,000
Potential Funding Sources	City Budget
Lead Department	Development Services
Implementation Schedule	1-5 years
Effect on Old Buildings	This will greatly mitigate the effect of wildland fire on all buildings by increasing mitigation actions through public awareness and education campaigns, especially during periods of low rain and high heat.
Effect on New Buildings	This will greatly mitigate the effect of wildland fire on all buildings by increasing mitigation actions through public awareness and education campaigns, especially during periods of low rain and high heat.
Cost Effectiveness	This project is cost effective when compared to property damage, crop consumption, and potential loss of life that can be attributed to the hazards of wildland fire.
Discussion	The City of Lavon is highly susceptible to the dangers posed by wildland fire. By educating the public, they will be more aware of conditions, hazard assessment, and any applicable codes or burn ban enforcements applied by the city. This will mitigate the hazards associated with wildland fire.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

City of Lavon Action Items: New

City of Lavon Action Item	Implement Hazard Mitigation Education Series to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation

City of Lavon Action Item	Develop and implement an extreme temperature program that establishes heating and cooling centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2-D, 3-C
Priority	High
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

City of Lavon Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Program would give rebates to residents who purchase and install safe rooms for their homes or properties.

City of Lavon Action Item	Continue to increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	High. Cost to implement small compared to benefits
Discussion	Early warning is a key element in keeping citizens that are outdoors notified of hazards. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Lavon Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Watershed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Lavon Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A, 3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	1-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire and measures to mitigate vulnerability.

City of Lavon Action Item	Adopt and enforce water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Adopt and enforce water restriction ordinances to limit water consumption to mitigate against drought. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Lavon Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Lavon Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Lavon Action Item	Hardening of critical public buildings to include installation of generators and other measures necessary to ensure continuous operation.
Hazard(s) Addressed	Flood, Winter Storm, Thunderstorm, Wind, Earthquake
Goal/Objective	
Priority	High
Estimated Cost	$2,000,000
Potential Funding Sources	FEMA, HMGP, GLO
Potential Matching Sources	Local funds
Lead Department	City Administration, Approved Contractor
Implementation Schedule	1-2 years
Effect on Old Buildings	Significant protection for City Hall, Police Department, Fire Department and other critical public buildings throughout the City.
Effect on New Buildings	Improve effectiveness of new structures and infrastructure.
Cost Effectiveness	High. This reduces the risk to existing and future structures and interruption of critical services.

Discussion	Ensure continuous operation of critical facilities to reduce environmental impacts due to failure to function, reduce threat to public health and safety.

City of Lavon Action Item	Develop Cybersecurity and Response Plan
Hazard(s) Addressed	Critical information systems for emergency and public safety services, traffic signals, sanitary sewer operations
Goal/Objective	
Priority	High
Estimated Cost	$20,000
Potential Funding Sources	General Fund
Potential Matching Sources	Local funds
Lead Department	City Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	NA.
Effect on New Buildings	NA
Cost Effectiveness	High. This Plan would provide additional training and resources to prevent cybersecurity incidents
Discussion	Plan would be used to identify vulnerabilities and improvements.

National Flood Insurance Program (NFIP) Compliance

Lavon is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481313#	LAVON, CITY OF	COLLIN COUNTY	5/23/1978	4/2/1991	06/02/09(M)	5/13/1991	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Lavon	City Engineer	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the City Services office. The City of Lavon requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Ordinance.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	The City of Lavon participates in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	
		Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	City public works department installs signs at low water crossings.	
		Future Mitigation Projects	The City of Lavon will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating, and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the City of Lavon has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions, is ultimately responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Lavon, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Lavon will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
City Administrator	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
Fire Chief	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Likewise, each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting same for approval by the state, FEMA and each local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms (In compliance with 201.6(c)(4)(ii))

2016 Plan Incorporation: The vulnerability and capabilities assessments for each jurisdiction were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into existing local planning strategies and mechanisms. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Lavon	City Council	Budget.	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Fire Chief	Emergency Action Plan	Triennially	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, City Administrator	Capital Improvement Plan	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency Plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	As needed	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Lavon Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.



Annex K: City of Lowry Crossing

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Lowry Crossing participated on the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the main plan; this annex serves as a complete hazard mitigation planning tool for the City of Lowry Crossing. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex is explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Lowry Crossing has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Lowry Crossing officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and onlne.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences

Source	Data
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Lowry Crossing Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services; the efforts of the planning committee were led by the Lowry Crossing Emergency Management Coordinator. The table below provides a list of the primary representatives on the Lowry Crossing planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Lowry Crossing City Council	Mayor Pro Tem	Plan Development
City of Lowry Crossing	City Secretary	Plan Development
Lowry Crossing Fire Dept.	Chief	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified

risks.

- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders emailed and involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Milligan Water Supply	General Manager	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the planning committee met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Mitigation Plan sent to Lowry Crossing for update – August 18, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2021 at 9AM

The City provided input back to the County after internal review an updates on March 23, 2020.

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring

communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Lowry Crossing identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Lowry Crossing and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%		Minor	Very few injuries, if at all none	0

	Life Impact	Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for Lowry Crossing

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	2	1.05
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	1	1	0.95
Extreme Heat	2	0	0	0	0.6
Flooding	1	0	1	0	0.55
Hail	2	0	0	1	0.7
High Winds	2	0	1	1	0.95
Lightning	1	0	0	0	0.3
Tornado	2	1	1	2	1.4
Wildfire	2	0	0	1	0.7
Winter Storms	2	0	2	2	1.3

The conclusions drawn from the hazard profiling process for Collin County jurisdictions, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Lowry Crossing.

Table 3.3 Hazard Rankings for the City of Lowry Crossing

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Drought Tornado Winter Storm
Low Risk (PRI 0.50 – 1)	High Winds Expansive Soils Flooding Hail Wildfire Extreme Heat
Negligible to No Risk (PRI 0 – 0.49)	Dam Failure Earthquake Lightning

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability Lowry Crossing faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included in this plan.

Dam Failure the City of Lowry Crossing is not known to be subject to dam failure, but as a participant in the county plan inundation studies will be considered.

Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Lowry Crossing are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Lowry Crossing and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake While there are no known reports of seismic activity in Lowry Crossing, there is always the possibility that it could happen. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soil Lowry Crossing is extremely vulnerable to the effects of expansive soil. Road failures are a common occurrence from this hazard. This can create driving conditions that may be dangerous for an experienced driver, let alone a new driver.

Extreme Heat Extreme Heat is a definite threat throughout all of Collin County, including Lowry Crossing. We have experienced rolling blackouts due to extreme heat through the years. Extreme heat generally affects the entire population, but it is especially dangerous to the homeless, elderly, the very young, those without air conditioning, and those who require refrigerated medications.

Flooding The City of Lowry Crossing has experienced some flash flooding in the past, specifically on Bridgefarmer Road in the 2200 block and the 1700 block area. FM 546 also has issues will flooding from Lake Lavon.

Hail As all other areas, populations and properties in Lowry Crossing have the potential to be vulnerable to hail and hail damage. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Lowry Crossing usually has at least one high wind event with damage each year. Most of these are roof and fence damage events with debris

Lightning is a threat to everyone. Lowry Crossing relies on the volunteer fire department to respond to any situation created by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. Property without lightning protection and exposed populations are most vulnerable.

Tornadoes The City of Lowry Crossing has several areas that are vulnerable to tornadoes. The City does not have storm sirens at this time. A few citizens have storm shelters or safe rooms. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildfires According to the Texas Forest Service Lowry Crossing is moderate risk for wildfires with 93.39% of the population in the WUI area. While we are primarily a bedroom community, there are still many open areas and borders Corps of Engineer land along the East Fork of the Trinity River. During times of drought, burn bans, and high fire threat, automatic mutual aid between the cities is enacted. The Lowry Crossing Volunteer Fire Department has a brush truck. They have supplied mutual aid to nearby cities and county areas for grass fires. We provide fire-wise education to the citizens on a regular basis.

Winter Storms Lowry Crossing has experienced winter storms and the winter of 2013 provided power outages for multiple days for many of our citizens. Travel was treacherous. Vulnerable populations include the elderly, homeless, and those without heat.

Identification of Assets and Vulnerability Assessment

An inventory of Lowry Crossing's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG population estimates, the total population of the City of Lowry Crossing in 20202 was 1,756 people, with 607 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Lowry Crossing	1,756	0.16%	683.27	618	0.16%	240.59

Source: 2020 NCTCOG Population Estimate

Table 3.5 summarizes population counts and population chance (absolute and percent predications for Lowry Crossing).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Lowry Crossing	1,711	1,710	1,710	0	0%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 855 parcels in Lowry Crossing, with an estimated $127,734,063 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Lowry Crossing	855	0.10%	$127,734,063

Source: County Data and Regional Hazard Assessment Tool

Emergency Facilities

There is one identified emergency facilities in Lowry Crossing, a volunteer fire station located at 1407 S. Bridgefarmer Road. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Lowry Crossing	1	0	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are no critical facilities, which are considered non-emergency in Lowry Crossing.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Lowry Crossing	0	0

Source: Local jurisdictions

Critical Infrastructure

There is one identified critical infrastructure facilities in Lowry Crossing, including one helipad, there are no natural gas facilities, no water treatment facilities, no wastewater treatment facilities, no dams, or railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Lowry Crossing	1	0	0	0	0	1

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, Lowry Crossing's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Lowry Crossing, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. Table 3.10 summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	

Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerability Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lowry Crossing are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Lowry Crossing are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Lowry Crossing. The City of Lowry Crossing and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to developed areas and the improved property in the City of Lowry Crossing is not vulnerable to this hazard.

Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to buildings and the emergency facilities in City of Lowry Crossing are not vulnerable to this hazard.
Critical Facilities	According to National Climatic Data Center (NCDC), there is zero (0) impact of extreme heat to buildings, and the critical facilities in City of Lowry Crossing are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is zero (0) impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in City of Lowry Crossing .

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 19.70% of the population of City of Lowry Crossing is located within the 100-year floodplain.
Improved Property	There have been zero (0) recorded flood events in the City of Lowry Crossing. Property losses are expected but unknown due to inaccurate reporting however county-wide property loss is estimated at $15,166.67 per year. No crop losses are expected or recorded county-wide. Approximately $213,547,769 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	There are zero (0) emergency facilities at imminent risk from the 100-year storm event.
Critical Facilities	There are zero (0) critical facilities located within the 100-year storm event.
Critical Infrastructure	10% of railways/highways and bridges, 0% of dams, 0% of water treatment works, and 0% waste water treatment facilities are at risk from the 100-year storm event. Many of these structures are designed to traverse or be located within the floodplain due to unavoidable circumstances. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lowry Crossing are expected but unknown due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards,

	available historical data for Lowry Crossing indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Lowry Crossing are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Lowry Crossing is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lowry Crossing are expected but unknown due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Lowry Crossing.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Lowry Crossing are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in Lowry Crossing. All the population of the City of Lowry Crossing is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lowry Crossing are expected but unknown due to lack of accurate reporting.

Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Lowry Crossing are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Lowry Crossing are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Lowry Crossing. All the population of Lowry Crossing is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI) property losses in the City of Lowry Crossing are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Lowry Crossing.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Lowry Crossing are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Lowry Crossing are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Lowry Crossing are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 93.39% of Lowry Crossing is vulnerable to wildfires, with the City of Lowry Crossing and the unincorporated areas contributing with the majority of the exposed population. There have been one (1) recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, property losses in the City of Lowry Crossing are expected but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Lowry Crossing are also unknown.

Emergency Facilities	Based on geographic information there are one fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are zero schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are one helipad, one bridge, zero dams, zero wastewater treatment facility, and zero water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Lowry Crossing. All the population of the City of Lowry Crossing are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lowry Crossing are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Lowry Crossing.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Lowry Crossing are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Lowry Crossing are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Lowry Crossing are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, Lowry Crossing considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
Lowry Crossing	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	N	N	N	**75%**
Average % Yes Capabilities – 75%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Lowry Crossing	Y	Y	Y	Y	N	Y	N	N	Y	Y	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Lowry Crossing	N	N	N	N	N	Y	N	N	N	N	**10%**
Average % Yes Capabilities – 10%											
Y- Yes N- No ?- Don't Know											

To quantify Collin County's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-

70%), and strong (70-100%). Questionnaire responses indicated that on average, Collin County and its jurisdictions have 70% of identified legal and regulatory capabilities, 10% of identified administrative and technical capabilities, and 10% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Lowry Crossing	Mayor	The city council, including the mayor, mayor pro-tem, and council members, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Town of Lowry Crossing Hazard Mitigation Planning Team developed mitigation strategies for the Plan update. The goals are similar to the goals identified in Section 6 by the Collin County Hazard Mitigation Action Plan Working Group.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Lowry Crossing Action Items: Deferred from 2016 Plan

Lowry Crossing Action Item	Implement Hazard Mitigation Education Series to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	2A, 2B, 2C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	FEMA
Potential Matching Sources	N/A
Lead Department	City Administration
Implementation Schedule	0 – 24 Months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Will be instrumental in planning and correction.
Discussion	In FY2022 Lowry Crossing is partnering with NCTCOG on a flood study of 17 miles of tributary within the city.
Status	Continue - Received supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Lowry Crossing Action Item	Implement Storm Shelter/Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1B
Priority	High
Estimated Cost	$3000/safe room
Potential Funding Sources	Federal Grants
Potential Matching Sources	NCTCOG
Lead Department	City Administration
Implementation Schedule	1-3 years
Effect on Old Buildings	Existing construction could have safe room added
Effect on New Buildings	New building could be constructed with safe rooms
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind.
Discussion	Develop list of storm shelter and safe rooms for emergency personnel to check safety of inhabitants.
Status	Continue - Will be included in 2021, however, some residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Lowry Crossing Action Item	Develop and adopt a drought contingency plan.
Hazard(s) Addressed	Drought
Goal/Objective	3A, 3B, 3C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Local Funds
Potential Matching Sources	
Lead Department	City Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Very low cost to ensure benefit of saving water for future generations.
Discussion	Drought contingency plan will limit water usage based on drought conditions.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Develop and implement an extreme temperature program that establishes heating and cooling centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	Protect existing and new properties from the effects of all natural hazards.
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	12-18 Months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 months – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.

Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

Lowry Crossing Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Lowry Crossing Action Items: New Items

Lowry Crossing Action Item	Encourage all residents to use weather alert apps on smart phones
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Earthquake
Goal/Objective	1A
Priority	High
Estimated Cost	0
Potential Funding Sources	N/A
Potential Matching Sources	N/A
Lead Department	Department of City Administration
Implementation Schedule	12 – 36 months

Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	
Discussion	Lowry Crossing would encourage residents to utilize severe weather alerts on smart phones to warn about impending natural hazard events.

Lowry Crossing Action Item	Implement Hazard Mitigation Education Series to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning
Goal/Objective	2A, 2B, 2C
Priority	High
Estimated Cost	$75,000 (city portion)
Potential Funding Sources	FEMA
Potential Matching Sources	N/A
Lead Department	Department of City Administration
Implementation Schedule	0 – 24 Months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Will be instrumental in planning and correction.
Discussion	In FY2022 Lowry Crossing is partnering with NCTCOG on a flood study of 17 miles of tributary within the city.

Lowry Crossing Action Item	Implement Storm Shelter/Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1B
Priority	High
Estimated Cost	$3000/safe room
Potential Funding Sources	Federal Grants
Potential Matching Sources	NCTCOG
Lead Department	Department of City Administration
Implementation Schedule	1-3 years
Effect on Old Buildings	Existing construction could have safe room added
Effect on New Buildings	New building could be constructed with safe rooms

Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind.
Discussion	Develop list of storm shelter and safe rooms for emergency personnel to check safety of inhabitants.

Lowry Crossing Action Item	Develop and adopt a drought contingency plan.
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3A, 3B, 3C
Priority	High
Estimated Cost	$5,000
Potential Funding Sources	Local Funds
Potential Matching Sources	
Lead Department	Department of City Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Very low cost to ensure benefit of saving water for future generations.
Discussion	Drought contingency plan will limit water usage based on drought conditions. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

Lowry Crossing Action Item	Develop and implement an extreme temperature program that establishes heating and cooling centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

Lowry Crossing Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 months – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

Lowry Crossing Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	4-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Department of City Administration
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.

Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Lowry Crossing Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Department of City Administration
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information

Lowry Crossing Action Item	Generator on City Hall
Hazard(s) Addressed	Winter Weather, Tornado, Severe Storms, Earthquake
Goal/Objective	2-B, 1-A
Priority	High
Estimated Cost	TBD
Potential Funding Sources	General Funds
Potential Matching Sources	General Funds
Lead Department	Department of City Administration
Implementation Schedule	FY 2022
Effect on Old Buildings	Provides backup power to current City Hall in the event of power loss from an all-hazards event
Effect on New Buildings	N/A (RetroFit)
Cost Effectiveness	Low

Discussion	This will provide backup power to the City Hall. This space could be used for multiple functions in the City in the event of power outages. It also would allow for City Functions to continue following a power outage.

National Flood Insurance Program (NFIP) Compliance

Lowry Crossing is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481631#	LOWRY CROSSING, CITY OF	COLLIN COUNTY	12/6/1977	3/16/1981	6/2/2009	8/22/1991	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Lowry Crossing	City Secretary	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the office of the City Secretary. Lowry Crossing requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $2000 per violation plus court costs.
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	Lowry Crossing works with Collin County in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Lowry Crossing, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Lowry Crossing will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or

magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
City Secretary	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Lowry Crossing	City Secretary, City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
		Emergency Action Plan updates	Triennially	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
		Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
		Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
		Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
		Natural Resource Conservation Plan	Annually	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Lowry Crossing Hazard Mitigation Planning Team considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex L: City of Lucas



1. Introduction

This annex was updated in 2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. This plan updates the Lucas Hazard Mitigation Plan submitted to FEMA as part of the 2021 Collin County HazMAP. The City of Lucas participated on the Collin County Hazard Mitigation Planning Team (HMPT) for this update. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Lucas. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Lucas has historically implemented measures to reduce vulnerability to hazards, passage of the DMA 2000 helped city officials to recognize the benefits of a long-term approach to hazard mitigation, which seeks to achieve a gradual decrease of hazard impacts through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts and collaboration of all participating jurisdictions, the public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for members of the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and the local newspaper.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
2020 Collin County Appraisal District; U.S. Census Bureau – QuickFacts: City of Lucas, TX; North Central Texas Council of Governments (NCTCOG) Regional Data Center	Population and demographics

Source	Data
Regional Hazard Assessment Tool; National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service – Texas Wildfire Risk Assessment Summary Report	Wildfire threat and Wildland Urban Interface data
National Inventory of Dams	Dam information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Lucas Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdictions' planning committees. Representatives included mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. The efforts of the planning committees and the HMPT were led by the Collin County Assistant Emergency Management Coordinator. The table below provides a list of the primary representatives on the City of Lucas Hazard Mitigation Planning Committee.

Table 2.2 City of Lucas Hazard Mitigation Planning Committee – Primary Representatives

Representing	Position	Role
Fire-Rescue/Emergency Management	Assistant Fire Chief/EMC	Plan Development and Update
Fire-Rescue/Emergency Management	Division Chief/Assistant EMC	Plan Development and Update
Emergency Management	Emergency Management Intern	Plan Development and Update
Fire-Rescue	Fire Chief	Plan Development and Update
Development Services	Development Services Director	Plan Feedback
Engineering/Public Works	City Engineer/Public Work Director	Plan Feedback
Public Works	Public Works Supervisor	Plan Feedback

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing, and formatting.

- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the City of Lucas Annex:

PlanTable 2.3 External Stakeholders

Representing	Position	Role
Love Joy ISD	Facilities Supervisor	Plan review/comment

After State of Texas and FEMA approval of the plan, each organization is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and the City of Lucas:

- Collin County 2021 Kickoff Meeting – August 12, 2020
- Collin County Hazard Mitigation Committee Meeting – November 5, 2020
- City of Lucas Hazard Mitigation Committee Meeting – January 10, 2021
- City of Lucas HazMAP Discussion and Update – February 10, 2021 and May 24, 2021

- Collin County 2021 HazMAP Update Meeting 2 – June 10, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

As there were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties, no feedback was incorporated.
Public meetings provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Lucas identified several natural and technological (man-made) hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources from federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Lucas and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the PRI allows for the prioritization of identified high hazard risks for mitigation planning purposes and, more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but, rather, is meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in the City of Lucas based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were determined by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%) in decimal form. These values may be adjusted during future updates to this plan. In order to evaluate the risk of each hazard, the assigned Index Value for each category is multiplied by the Weighing Factor. Then, the PRI value for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for City of Lucas

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.70
Extreme Heat	2	1	0	2	1.15
Flooding	2	1	1	0	1.2
Hail	2	0	1	1	0.95
High Winds	1	0	0	1	0.4
Lightning	3	0	2	0	1.40
Tornado	2	1	2	1	1.55
Wildfire	2	1	0	1	1.05
Winter Storms	2	0	2	3	1.40

The conclusions drawn from the hazard profiling process for the City of Lucas resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For classification purposes, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Collin County.

Table 3.3 Hazard Rankings for City of Lucas

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Drought Tornado Winter Storm Extreme Heat Wildfire Lightning Flooding
Low Risk (PRI 0.50 – 1)	Expansive Soils Hail
Negligible to No Risk (PRI 0 – 0.49)	Earthquake High Winds Dam Failure

Changes in Development and Priorities (Requirement §201.6(d)(3))

The City of Lucas was a participating jurisdiction in the 2011 and 2016 Collin County Hazard Mitigation Action Plans (HazMAP) and this 2021 Collin County HazMAP update and will participate in future HazMAP updates.

According to U.S. Census and the North Central Texas Council of Governments (NCTCOG) data, projections estimate that the population of Lucas has grown from 5,166 (2010) to approximately 8,110 (2020), an increase of 67%. According to Collin County Appraisal District data, new housing developments have been established, increasing housing units from approximately 1,641 to 2,227. Structural and economic development (including Walmart, Wendy's, Starbucks, Chipotle, other fast food restaurants, Bank of America, 10 small business buildings, and several shopping centers) has taken place, with several other business buildings currently in development.

No new developments were built within a floodplain. To help mitigate the impacts of a disaster, Lucas has adopted storm water run-off regulations/ordinances and a design manual for retention ponds. To further mitigate impact of disaster, Lucas is committed to staying a certified Storm Ready and Firewise community.

New priorities are noted and ranked in each new action item, Section 6. Except for actions completed or cancelled, other priorities remain the same as in the previous version of this plan.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Lucas faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation in this plan.

Dam and Levee Failure – This hazard was identified as having negligible to no risk to the City of Lucas, but as a participant in the county plan inundation studies will be considered.

Drought – Drought is considered a moderate risk in Lucas. Drought has the potential to impact the entire planning area equally. All improved property, emergency facilities, critical facilities, and the entire population of Lucas are vulnerable to this hazard. Foundations of all buildings are vulnerable, however, older structures and those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapma-Cooper reservoir system are water sources for City of Lucas and are vulnerable to drought. In turn, the city's population, wildlife, and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake – This hazard was identified as having negligible to no risk to the City of Lucas. Although considered negligible risk using the PRI, the hazard can occur anywhere in the geographic planning area. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils – Although expansive soils are prevalent throughout Collin County, this hazard is considered a low risk to the City of Lucas based on the PRI. Structures with unmitigated foundations are at highest risk.

Extreme Heat – Extreme heat generally affects the entire population, but the homeless, children, elderly, and populations without air conditioning are most vulnerable. Extreme heat is considered a moderate risk in the City according to the PRI.

Flooding – The City of Lucas has two bridges that are occasionally affected by flash flooding and five roadways that are seldom affected by flash flooding, but are still a concern. These two bridges mentioned below are within the 1% (100-year) flood zone. As the City utilizes culverts instead of storm drains, multiple days of heavy rain can overwhelm culverts and cause flooding in residential areas. Flooding is considered a moderate risk in the City, according to the PRI.

The primary areas of flash flooding concern are the following bridges:

- The bridge at Stinson Road at Muddy Creek
- The bridge at Snider Lane at White Rock

During heavy rain events and when roadways are flooded, City staff from City of Lucas Fire-Rescue and City of Lucas Public Works barricade the roads to prevent vehicles from attempting to cross the flooded area. Access to the area is still available from other directions at both sites, however, direct access is temporarily disrupted. This temporary disruption could be averted if larger drainage structures could be built to manage storm water flow and retention. While the roadway is flooded, vehicles must drive three or four miles more in another direction to access the other roads into the area, therefore increasing the distance for emergency access into the area.

There are five other roadways that are seldom affected by flooding, but are still considered a concern by the City when flooding does occur. Those locations are:

- Winningkoff Road, ¼ mile south of Snider Lane
- Winningkoff Road, ¼ mile north of FM 3286
- Rock Ridge Road, ¼ mile north of FM 2170
- Rock Ridge Road, ¼ mile south of FM 1378
- The intersection of FM 1378 and FM 3286

Hail – All geographic areas of the City of Lucas are potentially vulnerable to hail. Based on the PRI, however, hail is considered a low risk in Lucas. Exposed populations, manufactured homes, and older properties are most vulnerable to hail.

High Winds – All geographic areas of the City of Lucas have the potential to be vulnerable to high winds. Based on the PRI, however, this hazard is rated as negligible to no risk in the City. Manufactured homes and exposed populations are most vulnerable.

Lightning – All geographic areas of the City of Lucas have the potential to be vulnerable to lightning. Based on the PRI, this hazard is rated as moderate risk in the City. Property without lightning protection and exposed populations are most vulnerable. A majority of the recent building fires in the City have been caused by lightning strikes, increasing the risk that lightning poses to the City.

Tornado – All geographic areas and populations of the City of Lucas have the potential to be vulnerable to tornadoes. Based on the PRI, tornadoes are rated as moderate risk in the City. Exposed populations, manufactured homes, and older properties are most vulnerable to damage from the high winds.

Wildfire – The City of Lucas is a diverse area of 12.6 square miles that is comprised of many small farms, ranch estates, and subdivisions. This creates a localized wildland fire issue. With so many existing farmhouses, ranch estates, and housing subdivisions intermixed and near each other, there are large open areas with a large number of houses and barns that are exposed to wildland fires. U.S. Army Corps of Engineers' property runs adjacent to parts of the City of Lucas. This puts the city within the Wildland Urban Interface. This area is an additional concern to the City as drought impacts Lake Lavon and the surrounding Corps property. There is currently no fuel management program or agreement with the Corps to manage fuel and this issue has been addressed in Chapter 4. However, the City of Lucas Fire-Rescue department is only responsible for response if wildfire were to occur in this area. There are no identified City of Lucas improved property, critical facilities, or critical infrastructure on the property. Lucas sits on the West side of Lake Lavon where there are vast areas of open spaces where campers and boaters use campfires for outdoor enjoyment and recreation. This has been the cause of a great majority of the wildland fires within the Lucas Fire District. There is a significant risk of wildland fire during the hot dry summers and dry winter conditions in Texas. Wildland fire is considered a moderate risk in the City according to the PRI.

Lucas Fire-Rescue currently has one (1) Type III Wildland Engine, funded by a cost-share from the Texas A&M Forest Service Emergency Services Grant. Lucas Fire-Rescue also has one (1) Type VI Wildland Engine. The long range plan for Lucas Fire-Rescue is to sustain Wildland Urban Interface (WUI) firefighting capability equipment, training, and response. This plan also provides for Lucas to answer on first alarms for any wildland fires in the southern part of Collin County. This project will support all other fire departments in Collin County through Collin County Mutual Aid. Lucas Fire-Rescue will also continue to be a part of the Texas Infrastructure Fire Mutual Aid System (TIFMAS), thus offering resources for the entire State of Texas.

Lucas is an NFPA Recognized Firewise USA Community and has been since 2012. Lucas holds an annual Firewise Educational Outreach program. Lucas, in cooperation with the Texas A&M Forest Service, will be conducting a Firewise Home Assessment training in the future to teach City residents how to do home assessments. To maintain Firewise status, residents of Lucas are encouraged to submit their volunteer hours for mitigation work they do around their homes and properties.

Additionally, in order to mitigate wildland fire affecting structures, updated building codes have been enacted requiring all new residential and new commercial structures to have fire suppression systems in the structures.

Lucas Fire-Rescue currently has 18 (out of 28 total) firefighters that have completed National Wildfire Coordinating Group (NWCG) training S130 and 190.

Lucas Fire-Rescue actively reports fires on the TFS Fire Reporting website and TXFIRS/NFIRS.

Winter Storms – Winter storms are considered a moderate risk threat to the City of Lucas according to the PRI. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic utility services, such as water and electricity, for an extended period of time. The most vulnerable populations to this hazard are the homeless, the elderly, and those without access to heat. Structures at risk include critical facilities and emergency facilities.

Identification of Assets and Vulnerability Assessment

An inventory of Lucas geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates and the US Census Bureau, the total population of Lucas in 2020 was 8,553 people, with 2,227 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Lucas Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Lucas	8,553	0.61%	509.10	2,855	0.74%	179.26

Source: US Census Bureau, Collin County Appraisal District, NCTCOG Regional Data Center
***Includes totals from incorporated jurisdictions not participating in the plan*

Table 3.5 summarizes population counts and population chance (absolute and percent predications for City of Lucas).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2019 Estimate	Population 2020 Estimate	Absolute Change 2019-2020	Percent (%) Change 2019-2020
City of Lucas	5,166	7,960	8,110	150	1.88%

Source: NCTCOG Regional Data Center

Improved Property

There are an estimated 3,446 parcels in Collin County, with an estimated $1,172,028,807 in total assessed value of building improvements. *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Lucas	3,446	0.96%	$1,172,028,807

Source: Collin County Appraisal District
[1] Includes public buildings (residential, commercial, industrial, agricultural, religious, government, education)

Emergency Facilities

There are three identified emergency facilities in the City of Lucas: City of Lucas Fire-Rescue station, City of Lucas City Hall, and City of Lucas Public Works building. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals	Government Buildings
City of Lucas	1	0	0	2

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are eight critical facilities, which are considered non-emergency in the City of Lucas. The critical facilities include six schools, two water pump stations, two water towers, and one sewer lift station. (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Water Pump Station	Water Tower	Sewer Lift Station
City of Lucas	6	2	2	1

Source: City of Lucas

Critical Infrastructure

There are two identified critical infrastructure facilities in City of Lucas. Two bridges are used for access to residential areas. The bridges are especially important should residents ever need to make a hasty evacuation of the area. There are no other critical infrastructure facilities in the City. There are no airports, no natural gas facilities, no water treatment facilities, zero wastewater treatment facilities, and zero dams. (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Lucas	0	0	0	0	0	2

Source: City of Lucas

Methodology

Based on the type of information available for analysis, the City of Lucas' vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Lucas, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X

Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to the National Centers for Environmental Information (NCEI), zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected, but financially unknown due to the lack of accurate reporting. Historical data indicates that crop losses in the City of Lucas are expected mostly during water shortages, but this is financially unknown due to the lack of accurate reporting.
Emergency Facilities	Foundation issues could occur to emergency facilities due to drought events.
Critical Facilities	Foundation issues could occur to critical facilities due to drought events.
Critical Infrastructure	Foundation issues and road degradation could occur to critical infrastructure due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to the National Centers for Environmental Information (NCEI), there are no fatalities recorded due to extreme heat in the City of Lucas. The City of Lucas and its population are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas. The improved property in the City of Lucas is not vulnerable to this hazard.
Emergency Facilities	According to the National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings. The emergency facilities in the City of Lucas are not vulnerable to this hazard.
Critical Facilities	According to the National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings. The critical facilities in the City of Lucas are not vulnerable to this hazard.
Critical Infrastructure	According to the National Centers for Environmental Information (NCEI), there is no impact of extreme heat to critical infrastructure. Vulnerability to this hazard is considered minimal in the City of Lucas.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 335 residential parcels in the City of Lucas are located within the 100-year (1% annual chance) floodplain.
Improved Property	There have been zero (0) recorded flood events in the City of Lucas. Property losses are expected but unknown due to inaccurate reporting. No crop losses are expected or recorded county-wide. Approximately $521,154,047 of the total assessed value is at risk from a 100-year (1% annual chance) storm event. As the City utilizes culverts instead of storm drains, multiple days of heavy rain can overwhelm the culverts and result in flooding in residential areas.
Emergency Facilities	Emergency facilities are potentially at risk during a 100-year (1% annual chance) storm event.
Critical Facilities	Critical facilities are potentially at risk during a 100-year (1% annual chance) storm event.
Critical Infrastructure	Critical infrastructure are potentially at risk during a 100-year (1% annual chance) storm event.

Summary Table 3.14

Hail	
Population	According to the National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected to be $9,428.57 per year from hail, however, these values are potentially underestimated due to the lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops can be damaged by hail events, available historical data for the City of Lucas indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictable geographical nature of hailstorms, all emergency facilities in the City of Lucas are vulnerable to this hazard.
Critical Facilities	Because of the unpredictable geographical nature of hailstorms, all critical facilities in the City of Lucas are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictable geographical nature of hailstorms, all critical infrastructure in the City of Lucas are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to the National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. The entire population of the City of Lucas is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected at $14.28 per year due to high wind events, however, these values are potentially underestimated due to the lack of accurate reporting. No crop losses have resulted from this hazard in Collin County.
Emergency Facilities	Because of the extensive geographical nature of high wind events, all emergency facilities in the City of Lucas are vulnerable to this hazard.
Critical Facilities	Because of the extensive geographical nature of high wind events, all critical facilities in the City of Lucas are vulnerable to this hazard.
Critical Infrastructure	Because of the extensive geographical nature of high wind events, all critical infrastructure in the City of Lucas are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to the National Centers for Environmental Information (NCEI), lightning events are not expected to cause any deaths or injuries in Collin County. However, the entire population of the City of Lucas is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected at $16,875 per year however these values are underestimated due to lack of accurate reporting. A majority of recent building fires in the City have been started by lightning. This has elevated the risk that lightning poses to the City.
Emergency Facilities	Because of the extensive geographical nature of lightning, all emergency facilities in the City of Lucas are vulnerable to this hazard.
Critical Facilities	Because of the extensive geographical nature of lightning, all critical facilities in the City of Lucas are vulnerable to this hazard.
Critical Infrastructure	Because of the extensive geographical nature of lightning, all critical infrastructures in the City of Lucas are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Lucas. The entire population of the City of Lucas is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected but unknown due to the lack of accurate reporting. No crop losses are expected from this hazard in the City of Lucas.
Emergency Facilities	Because of the unpredictable geographical impact of tornados, all emergency facilities in the City of Lucas are exposed and vulnerable to this hazard.
Critical Facilities	Because of the unpredictable geographical impact of tornados, all critical facilities in the City of Lucas are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of unpredictable geographical impact of tornados, all critical infrastructure in the City of Lucas are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 75.27% of the City of Lucas is vulnerable to wildfires. This includes both the City proper as well as the unincorporated areas that the City of Lucas Fire-Rescue services. There are no recorded injuries or fatalities due to wildfires in the City.
Improved Property	Annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting. Because of this, the percentage of the overall property improvement values impacted by wildfire across the City of Lucas are also unknown.
Emergency Facilities	Based on geographic location, there is one (1) fire station at risk from wildfire events.
Critical Facilities	Based on geographic location, there are four (4) schools at risk from wildfire events.
Critical Infrastructure	Based on geographic location, there are two (2) bridges, zero (0) dams, zero (0) wastewater treatment facilities, and zero (0) water treatment facilities at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to the National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms. It was not from the City of Lucas. The entire population of the City of Lucas is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Lucas are expected but unknown due to the lack of reporting. However, data indicates that county-wide property loss is expected to be $116,250 per year from this hazard. No crop losses are expected from this hazard in the City of Lucas.
Emergency Facilities	Because of the extensive geographical nature of winter storms, all emergency facilities in the City of Lucas are exposed and vulnerable to this hazard.
Critical Facilities	Because of the extensive geographical nature of winter storms, all critical facilities in the City of Lucas are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of extensive geographical nature of winter storms, all critical infrastructure in the City of Lucas are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Lucas considered the level of hazard risk as well as the City's existing capabilities that can be used to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
City of Lucas	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	?	?	**64.3%**
Average % Yes Capabilities – 64.29%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Lucas	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	**90%**
Average % Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
City of Lucas	N	Y	Y	Y	Y	Y	Y	?	N	?	**60%**
Average % Yes Capabilities – 22.2%											
Y- Yes N- No ?- Don't Know											

To quantify Collin County's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%),

and strong (70-100%). Questionnaire responses indicated that on average, Lucas has 62.49% of identified legal and regulatory capabilities, 90% of identified administrative and technical capabilities, and 60% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Lucas	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions, expand, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, the Collin County Hazard Mitigation Planning Team developed a mitigation strategy for the Plan update, utilizing the results of both assessments as well as reviewing the goals and objectives that were included in the 2009 HazMAP. These strategies were similar to the goals identified in Section 6 by the Collin County Hazard Mitigation Action Plan Working Group.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within Lucas.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic, and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Lucas: Action Items Deferred from 2016 Plan

City of Lucas Action Item	Develop a Community Wildfire Protection Plan (CWPP).
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$20,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, donations, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from Collin County and the Texas A&M Forest Service.
Implementation Schedule	18-36 Months
Effect on Old Buildings	Will reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Will reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show officials where to focus their efforts in preventing wildfire. Saving lives and protecting property is cost effective in the long-run.
Discussion	This project will become needed as the population in the Wildland Urban Interface area increases. This plan will protect life and property.
Status	Not yet started.

City of Lucas Action Item	Develop a wildfire and drought education program for residents.
Hazard(s) Addressed	Wildfire, Drought

Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$5,000.00
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from the Texas A&M Forest Service
Implementation Schedule	0-12 months
Effect on Old Buildings	Will reduce vulnerability of existing buildings to wildfire and drought through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to wildfire and drought through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from wildfire and drought. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop an extreme heat education program for residents.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to extreme heat through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to extreme heat through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from extreme heat. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop a winter weather/storm education program for residents.
Hazard(s) Addressed	Winter Storms
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HGMP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to winter weather/storms through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to winter weather/storms through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from winter weather/storms. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program
Status	Not yet started. The City will request supplies and materials from the NCTCOG when a plan for education and distribution has been determined.

City of Lucas Action Item	Develop a Large Animal Rescue Plan and educate residents on actions to mitigate impact to large animals from severe weather and natural disasters.
Hazard(s) Addressed	Flood, Tornado, Winter Storm, Wildfire
Goal/Objective	4-B
Priority	Medium
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue
Implementation Schedule	18-36 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	This project will help Lucas Fire-Rescue educate owners of large animals about how to mitigate impact to their large animals from severe weather and natural disasters. This plan will also give Lucas Fire-Rescue the

	plans and directions on rescuing large animals around the City during disaster.
Status	Not yet started.

City of Lucas Action Item	Implement stricter building codes and standards to mitigate the impacts of hazards to buildings around the City.
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, High Winds, Lightning, Tornado, Wildfire, Winter Storm
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000 - $15,000
Potential Funding Sources	Local
Potential Matching Sources	None
Lead Department	Planning and Zoning, Code Enforcement, Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Old buildings would be retrofitted to meet current or updated building code standards.
Effect on New Buildings	New buildings would be constructed to meet current or updated building code standards.
Cost Effectiveness	This is cost effective because it will protect life and property from future disasters.
Discussion	Updated and current building code standards will be continuously implemented in the City through retrofits to old buildings and initial construction to new buildings.
Status	The City of Lucas has adopted current building code and will continue to adopt the most current building codes. This action item will be included in future HazMAP updates.

City of Lucas Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	Earthquake
Goal/Objective	2-A
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years

Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce the vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low.
Discussion	Study results will identify information to determine mitigation projects
Status	No longer a relevant action item to the City of Lucas. This item will not be included as a 2021 Action Item.

City of Lucas Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants and/or state grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management, Public Works, Planning and Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils. This soil analysis will protect life and property.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Not yet started.

City of Lucas Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Emergency Management, Planning and Zoning

Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	No longer a relevant action item to the City of Lucas. This item will not be included as a 2021 Action Item.

City of Lucas: 2021 Action Items

City of Lucas Action Item	Develop a Community Wildfire Protection Plan (CWPP).
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$20,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, donations, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from Collin County and the Texas A&M Forest Service.
Implementation Schedule	18-36 Months
Effect on Old Buildings	Will reduce vulnerability of existing structures to damages or loss from wildfire.
Effect on New Buildings	Will reduce vulnerability of new structures to damages or loss from wildfire.
Cost Effectiveness	CWPPs show officials where to focus their efforts in preventing wildfire. Saving lives and protecting property is cost effective in the long-run.
Discussion	This project will become needed as the population in the Wildland Urban Interface area increases. This plan will protect life and property.

City of Lucas Action Item	Develop a wildfire and drought education program for residents.
Hazard(s) Addressed	Wildfire, Drought, Expansive Soils
Goal/Objective	4-A, $-B
Priority	Medium
Estimated Cost	$5,000.00
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants

Lead Department	Fire-Rescue and Emergency Management with assistance from the Texas A&M Forest Service
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to wildfire and drought through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to wildfire and drought through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from wildfire and drought. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Lucas Action Item	Develop an extreme heat education program for residents.
Hazard(s) Addressed	Extreme Heat
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to extreme heat through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to extreme heat through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from extreme heat. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.

City of Lucas Action Item	Develop a winter weather/storm education program for residents.
Hazard(s) Addressed	Winter Storms
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$5,000

Potential Funding Sources	HGMP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to winter weather/storms through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to winter weather/storms through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from winter weather/storms. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program

City of Lucas Action Item	Develop a Large Animal Rescue Plan and educate residents on actions to mitigate impact to large animals from severe weather and natural disasters.
Hazard(s) Addressed	Flood, Tornado, Winter Storm, Wildfire
Goal/Objective	4-B
Priority	Medium
Estimated Cost	$25,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue
Implementation Schedule	18-36 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	This project will help Lucas Fire-Rescue educate owners of large animals about how to mitigate impact to their large animals from severe weather and natural disasters. This plan will also give Lucas Fire-Rescue the plans and directions on rescuing large animals around the City during disaster.

City of Lucas Action Item	Implement stricter building codes and standards to mitigate the impacts of hazards to buildings around the City.
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, High Winds, Lightning, Tornado, Wildfire, Winter Storm
Goal/Objective	2-C
Priority	Medium

Estimated Cost	$10,000 - $15,000
Potential Funding Sources	Local
Potential Matching Sources	None
Lead Department	Planning and Zoning, Code Enforcement, Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Old buildings would be retrofitted to meet current or updated building code standards.
Effect on New Buildings	New buildings would be constructed to meet current or updated building code standards.
Cost Effectiveness	This is cost effective because it will protect life and property from future disasters.
Discussion	Updated and current building code standards will be continuously implemented in the City through retrofits to old buildings and initial construction to new buildings.

City of Lucas Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils, Drought
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants and/or state grants
Potential Matching Sources	Local funds
Lead Department	Emergency Management, Public Works, Planning and Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils. This soil analysis will protect life and property.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Lucas Action Item	Develop a tornado education program for residents.
Hazard(s) Addressed	Tornado
Goal/Objective	4-A, 4-B
Priority	Medium
Estimated Cost	$5,000

Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to tornados through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to tornados through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from tornados. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.

City of Lucas Action Item	Develop a Debris Management Plan
Hazard(s) Addressed	High Winds, Tornado, Wildfire, Flooding
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$20,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, donations, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management with assistance from Collin County, the Texas A&M Forest Service, and a private consulting firm.
Implementation Schedule	18-36 Months
Effect on Old Buildings	Will ensure that debris from older buildings and neighborhoods is properly managed and cleared before and after disaster.
Effect on New Buildings	Will ensure that debris from newer buildings and neighborhoods is properly managed and cleared before and after disaster.
Cost Effectiveness	Debris management is cost effective if done right. A Debris Management Plan will guide the City's debris management before and after disaster.
Discussion	This project is needed to ensure that the City has a clear plan for keeping debris minimal before disaster and cleaning/clearing debris effectively after disaster.

City of Lucas Action Item	Develop a flood education program for residents.
Hazard(s) Addressed	Flooding
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	HMGP, PDM, and/or General Fund

Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Fire-Rescue and Emergency Management
Implementation Schedule	2 years
Effect on Old Buildings	Will reduce vulnerability of existing buildings to floods through resident education and behavior.
Effect on New Buildings	Will reduce vulnerability of new buildings to floods through resident education and behavior.
Cost Effectiveness	Public education is extremely effective with a low cost.
Discussion	Residents will be educated on mitigation actions to protect their lives and property from floods. Residents will be provided with supplies and materials from the NCTCOG KnoWhat2Do Program.

City of Lucas Action Item	Build three carports: one at Fire-Rescue station for personal vehicles and two at City Hall, one for personal vehicles and one for City vehicles.
Hazard(s) Addressed	Hail
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$35,000
Potential Funding Sources	HMGP, PDM, and/or General Fund
Potential Matching Sources	Local funds, in-kind, and/or grants
Lead Department	Engineering and Development Services
Implementation Schedule	2 years
Effect on Old Buildings	No effect on existing buildings.
Effect on New Buildings	No effect on new buildings.
Cost Effectiveness	Protecting both employee and City vehicles from hail damage will save the City money in the long run.
Discussion	Carports will protect both City employees' personal vehicles as well as City vehicles from hail damage.

City of Lucas Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Drought, Earthquakes, Hail, Winds, Expansive Soils, and Lightning
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind

Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.be taken to reduce impacts on people and property.

National Flood Insurance Program (NFIP) Compliance

The City of Lucas is participating in the National Flood Insurance Program and has identified areas vulnerable to flooding. This is incorporated into all current and future planning for flood mitigation measures.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
481545#	LUCAS, CITY OF	COLLIN COUNTY	07/25/75	04/02/91	06/02/09	07/03/79	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to create and maintain a list of properties that hold a policy with NFIP along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Enforcement
City of Lucas	City Manager	Restrict or prohibit uses that are dangerous to health, safety or property in times of flooding, or cause excessive increases in flooding heights or velocities	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval.
		Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction	
		Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters	
		Control filling, grading, dredging and other development which may increase flood damage	
		Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions, are responsible for monitoring implementation of their plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Lucas, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Lucas will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Emergency Management Coordinator, Emergency Management Intern	Monitoring Plan: Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations.	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval and then presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising, and updating their respective plans and submitting them for approval. The plans will be updated every five (5) years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

2016 Plan Incorporation: The vulnerability and capabilities assessments for each jurisdiction were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into existing local planning strategies and mechanisms, as appropriate. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Lucas	City Council	Budget	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Fire Chief, Emergency Management Coordinator	Emergency Action Plan	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Planning Director	Capital Improvement Plan	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency Plan	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Lucas Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex M: City of Melissa



1. Introduction

This annex was prepared in 2020 as part of an update to the City of Melissa County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Melissa participated on the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the City of Melissa. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Melissa. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodologyand process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Melissa has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped City of Melissa officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. City of Melissa's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 the City of Melissa developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten the City of Melissa and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Melissa Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT. The efforts of the planning committee were led by the City of Melissa Emergency Management Coordinator.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. The City of Melissa acted as the plan development consultant providing hazard mitigation planning services. The table below provides a list of the primary representatives on the Melissa planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Fire Department	Fire Chief	Plan Development
Police Department	Police Chief	Plan Development
City Administration	City Manager	Plan Development
City Council	Councilmember	Plan Development
City Council	Mayor	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the county's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

Subsequent to the State of Texas and FEMA approval of the plan, each organization is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Collin County	Assistant EMC	Review of plan

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by City of Melissa and included all jurisdiction's participation:

- Melissa was provided with the Plan on August 12, 2020
- Meeting with Melissa and Collin County 8/24/2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Melissa identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Melissa and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Melissa jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Melissa HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Melissa based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Melissa, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
		Minor	Very few injuries, if at all none	0

35%	Life Impact	Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for City of Melissa

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	1	0	0.25
Drought	1	2	1	0	1.25
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	0	0.65
Hail	2	0	0	1	0.7

High Winds	1	0	0	1	0.4
Lightning	1	0	0	0	0.3
Tornado	2	1	1	1	1.3
Wildfire	1	2	0	1	1.1
Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for Collin County Jurisdictions, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Melissa.

Table 3.3 Hazard Rankings for the City of Melissa

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Winter Storms Wildfire Drought
Low Risk (PRI 0.50 – 1)	Extreme Heat Expansive Soils Hail Flooding
Negligible to No Risk (PRI 0 – 0.49)	Earthquake High Winds Lightning Dam Failure

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Melissa faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure At this time City of Melissa does not appear to be vulnerable to a dam failure,but as a participant in the county plan inundation studies will be considered.

Drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Melissa are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for City of Melissa and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations. Likewise the extent to how and when water is used from water sources does have a potential effect on revenues for the City of Melissa.

Earthquake Although the City of Melissa does not sit directly on a fault zone it located near the BalconesFault. Should an earthquake of medium/high magnitude occur along this fault, the City of Melissa would see damage to roadways, water/sewer lines, gas lines, buildings, and critical infrastructure. All propertiesand populations have the potential to be vulnerable to earthquakes.

Expansive Soils The City of Melissa has expansive soils in its jurisdiction. While great care is and has been taken to prevent the effects of soil expansion, should drought occur or periods of low rainfall occur residents, commercial, and industrial properties could see adverse effects to the structural integrity of their respective buildings. Expansive soils also have an effect on infrastructure causing pipes to crack andbreak. All properties and populations have the potential to be vulnerable to expansive soils.

Extreme Heat The City of Melissa can be subject to high or extreme heat from late April to early October.The highest recorded temperature in the Dallas/Ft. Worth area was 113 F. While most of the time city is not exposed to temperatures above 110 it is still possible. Temperatures of 95 F or above coupled with high humidity can have detrimental effects to not only the residential population, but also commercial andindustrial operations. High heat can cause roving black outs, drying out of vegetation in undeveloped areas (increasing fire risk), and the need for cooling centers for residents. High heat also has an effect on public works and public safety due to working in these temperatures and the damage to infrastructure.

Equipment in the water pump house often malfunctions during times of extreme heat. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding The City of Melissa could be subject to flooding due to the various infrastructure and development projects which are currently taking place. Highways and roadways are currently under development which could cause water to be inadvertently channeled to an unanticipated located. These same effects could occur as areas of the city are developed

Hail Severe thunderstorms are frequent in the Metroplex area, of which the City of Melissa is included. Severe thunderstorms have the potential to spawn tornados, high winds, hail, flooding, and lightning. All of these can result in damage to residential, commercial, and industrial properties. Damage to power lines and vegetation can occur as well. Roadways can be blocked due to low visibility and debris. Public Works and Public Safety departments are often taxed due to the calls for service. All properties and populations have the potential to be vulnerable to hail

High Winds Severe thunderstorms are frequent in the Metroplex area, of which the City of Melissa is included. Severe thunderstorms have the potential to spawn tornados, high winds, hail, flooding, and lightning. All of these can result in damage to residential, commercial, and industrial properties. Damage to power lines and vegetation can occur as well. Power outages are frequent and it may take anywhere from 30 minutes to 30 days to restore power. Roadways can be blocked due to low visibility and debris.

Public Works and Public Safety departments are often taxed due to the calls for service. All properties and populations have the potential to be vulnerable to high winds.

Lightning Severe thunderstorms are frequent in the Metroplex area, of which the City of Melissa is included. Severe thunderstorms have the potential to spawn tornados, high winds, hail, flooding, and lightning. All of these can result in damage to residential, commercial, and industrial properties. Damage to power lines and vegetation can occur as well. Power outages are frequent and it may take anywhere from 30 minutes to 30 days to restore power. Roadways can be blocked due to low visibility and debris. Public Works and Public Safety departments are often taxed due to the calls for service. Lightning also has the potential to start fires in structures as well as in open pastures. All properties and populations have the potential to be vulnerable to lightning.

Tornado Severe thunderstorms are frequent in the Metroplex area, of which the City of Melissa is included. Severe thunderstorms have the potential to spawn tornados. These can result in damage to residential, commercial, and industrial properties. Damage to power lines and vegetation can occur as well. Power outages are frequent and it may take anywhere from 30 minutes to 30 days to restore power. Roadways can be blocked due to low visibility and debris. Public Works and Public Safety departments are often taxed due to the calls for service. Tornados also have the capacity to leave many homeless and injured. It may take days, weeks, months, or even years to return to normal operations should a tornado occur in the City of Melissa. All properties and populations have the potential to be vulnerable.

Wildland Fire The City of Melissa is in the middle of the Wildland Urban Interface (WUI). The WUI has the potential to not only effect crops but also residential structures as fire swiftly burns across vegetation.Large wildfires have the potential to restrict traffic through roadways due to low visibility and the need to use all lanes for evacuation. At greatest risk are structures and populations located within the WUI. According to the Texas Forest Service, 60.25% of the population of Melissa lives within in the Wildland/Urban Interface.

Winter Storms The City of Melissa is subject to winter storms. Ice and snow can accumulate on roadways trapping drivers on the road and increasing the likelihood of accidents. Residents can be ill prepared for storms and may even be in their homes without electricity, heat, or running water.

Commercial and industrial business see adverse effects as potential customers remain in doors and workers are unable to report for their jobs. All of which negative impacts on the City of Melissa economy.All properties and populations have the potential to be vulnerable to winter storms.

Identification of Assets and Vulnerability Assessment

An inventory of Melissa geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by the 2020 NCTCOG population estimates.
- **Improved property**: Includes all developed properties according to local parcel data from the Melissa. The information has been expressed in terms of the total assessed value of improvements

that may be exposed to the identified hazards.

- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Melissa Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, and Melissa. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Melissa Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates and the US Census Bureau, the total population of Melissa in 2020 was 12,381 people, with 4,589 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Melissa	19,161	1.13%	1,044.81	5,813	1.13%	367.89

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for Melissa).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Melissa	4,695	11,927	13,980	2,053	12.94%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 6,466 parcels in Melissa, with an estimated $1,014,828,346 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Melissa	6,466	1.34%	$1,014,828,346

Source: Collin County Appraisal District

Emergency Facilities

There are 2 identified emergency facilities in the City of Melissa, including 1 fire station and 1 police station, and zero hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographiccoordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Melissa	1	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are 5 critical facilities, which are considered non-emergency in Melissa. The critical facilities include five schools and zero historical property sites. *Table 3.8*. Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Melissa	6	3

Source: Local jurisdictions

Critical Infrastructure

There are 30 identified critical infrastructure facilities in Melissa, including 0 airports, 2 natural gas facilities, no water treatment facilities, 0 wastewater treatment facilities, 0 dams, and 28 railway/highway bridges. (*Table 3.9*).

Table 3.8 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Melissa	0	2	0	0	1	28

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Melissa vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Melissa, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	

Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Melissa are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were one (1) fatality recorded due to extreme heat from the City of Melissa. All of the City of Melissa and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Melissa is not vulnerable to this hazard.

Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Melissa are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Melissa are not vulnerable to this hazard.
Critical Infrastructure	Extreme heat has had an impact on equipment at the water pump house causing it to malfunction and become inoperable. However, overall vulnerability to this hazard is considered minimal in the City of Melissa.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 54 residential parcels in the City of Melissa are located within the 100-year floodplain.
Improved Property	There have been five (5) recorded flood events in the City of Melissa. Property losses are expected at $7,400 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $6,742,366 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected at $342.86 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Melissa indicates that there are no expected crop losses from this event.

Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Melissa are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Melissa are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Melissa are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Melissa is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected at $3,514.29 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Melissa.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Melissa are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Melissa are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Melissa are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no deaths or injuries in the City of Melissa. All the population of the City of Melissa is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected but unknown due to lack of accurate reporting

Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Melissa are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Melissa are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Melissa are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Melissa. All the population of the City of Melissa is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Melissa.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Melissa are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Melissa are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Melissa are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 60.25% of Melissa is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Melissa are also unknown.
Emergency Facilities	Based on geographic information there is 1 fire station and 1 police station at risk from wildfire events.
Critical Facilities	Based on geographic information there are 6 schools at risk from wildfire events.

Critical Infrastructure	Based on geographic information there are 4 natural gas facilities and 28 railway/highway bridges at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Melissa. All the population of the City of Melissa are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Melissa are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Melissa.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Melissa are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Melissa are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Melissa are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, Melissa considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
City of Melissa	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	?	**92%**
Average % Yes Capabilities – 92.86%															
Y- Yes N- No ?- Don't Know															

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Melissar	Y	Y	Y	Y	Y	Y	N	N	Y	N	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

Fiscal Capabilities											
Jurisdiction	**Community Development Block Grants (CDBG)**	**Capital improvements project funding**	**Authority to levy taxes for specific purposes**	**Fees for water, sewer, gas, or electric service**	**Impact fees for homebuyers or developers for new developments/homes**	**Incur debt through general obligation bonds**	**Incur debt through special tax bonds**	**Incur debt through private activity bonds**	**Withhold spending in hazard-prone areas**	**Other**	**% Yes per Jurisdiction**
City of Melissa	Y	Y	Y	Y	Y	Y	Y	N	Y	?	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify Mellissa's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire response indicated that Melissa has 92.86% of identified legal and regulatory capabilities, 70% of identified administrative and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Melissa	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the City of Melissa Hazard Mitigation Planning Committee developed mitigation strategies for the Plan update.

Goal 1 Reduce or eliminate loss of life, injuries and property damage resulting from severeweather events.

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.

Objective 1-B Expand and coordinate Early Warning Systems currently in use.

Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 Protect existing and new properties from the effects of all natural hazards.

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.

Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.

Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.

Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 Reduce losses and repetitive damages for chronic hazard events.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within the City of Melissa.

Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.

Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 Develop public education campaigns to disseminate information about actions to mitigatepotential loss of life, injuries and property damage resulting from natural hazards.

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.

Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Melissa Action Items: Deferred from 2016 Plan

City of Melissa Action Item	Adopt and promote public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages

Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Program will include information on hazard mitigation and what actions can be taken to reduce impacts on people and property.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Melissa Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in the safety of citizens who are outdoors
Discussion	Outdoor warning sirens help prevent loss of life during severe storms.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Develop and implement an extreme temperature program that identifiesboth safe locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind

Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	May require retrofit
Effect on New Buildings	None
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	12 to 24 months
Effect on Old Buildings	Retrofit will increase life safety
Effect on New Buildings	Will add additional protection to reduce injury and loss of life
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Residential safe room programs help prevent loss of life during tornado or severe storm.
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Melissa Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms

Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens andprovide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones

Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfireinterface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works

Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with localwater supplies to increase public education on drought. Develop and implement mandatory water restrictions for water conservation.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Melissa Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low

Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	

City of Melissa Action Items: New

City of Melissa Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety

Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.be taken to reduce impacts on people and property.

City of Melissa Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	High
Estimated Cost	$25,000
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in the safety of citizens who are outdoors
Discussion	Outdoor warning sirens help prevent loss of life during severe storms. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Melissa Action Item	Develop and implement an extreme temperature program that identifiesboth safe locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A
Priority	Medium
Estimated Cost	Current staffing project time/resources
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	H.R. Dept.
Implementation Schedule	12 months
Effect on Old Buildings	May require retrofit

Effect on New Buildings	None
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

City of Melissa Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	12 to 24 months
Effect on Old Buildings	Retrofit will increase life safety
Effect on New Buildings	Will add additional protection to reduce injury and loss of life
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Residential safe room programs help prevent loss of life during tornado or severe storm.

City of Melissa Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management

Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information

City of Melissa Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Melissa Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	3-A
Priority	Medium

Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventingwildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.

City of Melissa Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with localwater supplies to increase public education on drought. Develop and implement mandatory water restrictions for water conservation. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Melissa Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Melissa Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.

Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

National Flood Insurance Program (NFIP) Compliance

Melissa is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481626#	MELISSA, CITY OF	COLLIN COUNTY	-	4/2/1991	06/02/09(M)	4/9/2009	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions

.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Melissa	City Engineer	Complete and maintain FEMA elevation certificates for pre-FIRM and orpost-FIRM buildings	Permits are issued through the City Engineer. The City of Melissa requires 2 feet of freeboard above the base flood elevation forthe top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of theFlood Damage Prevention Order	NFIP complianceis implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval.
		Floodplain developmentpermits	Permits are required forany new construction ina floodplain.	
		Future Mitigation Projects	The City of Melissa willcontinue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Melissa, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the City of Melissa will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Fire Chief	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner’s Court and the respective

councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Melissa	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Fire Chief	Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education

	Planning Director, City Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Melissa Hazard Mitigation Planning Team considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex N: City of Murphy

1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Murphy participated on the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the City of Murphy. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Murphy. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Murphy has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Murphy officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Resource Conservation Services	Dam information
National Inventory of Dams	Dam information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Murphy Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. The City of Murphy acted as the plan development consultant providing hazard mitigation planning services; the efforts of the planning committees and the HMPT were led by the Collin County Assistant Emergency Management Coordinator. The table below provides a list of the primary representatives on the Murphy planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Murphy Fire Rescue	Fire Chief/Emergency Management Coordinator	Facilitator/Plan Development
Murphy Fire Rescue	Fire Marshal/Emergency Management Specialist	Plan Development/Data Research
Murphy City Management	City Manager	Provided Data/Mapping
Murphy Public Works	Public Works Director	Provide Data/Flood Plain
Murphy Police Department	Police Chief	Plan Development
Murphy Community Development	Building Official	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.

- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Community ISD	School Board Member	Review of plan
North Texas Municipal Water District	Board Member	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each jurisdiction also is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – November 5, 2020
- Collin County Planning Meeting – June 12, 2021
- Murphy and Collin Planning Meeting/Discussion – July 21, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committees provided opportunities, announced through public communication means, for public

participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.
This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Team Committee for the City of Murphy identified several natural hazards and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the City of Murphy and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Murphy

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	2	1	0	2	1.15
Flooding	1	1	0	2	0.85
Hail	1	0	0	2	0.5
High Winds	1	0	1	2	0.75
Lightning	2	0	2	1	1.2
Tornado	1	0	0	1	0.4
Wildfire	1	0	0	1	0.4
Winter Storms	2	0	1.5	3	1.28

The conclusions drawn from the hazard profiling process for the City of Murphy, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Murphy.

Table 3.3 Hazard Ranking for the City of Murphy

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Extreme Heat Drought Winter Storms Lightning
Low Risk (PRI 0.50 – 1)	Expansive Soils Flooding Hail High Winds
Negligible to No Risk (PRI 0 – 0.49)	Wildfire Earthquake Dam Failure Tornado

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

The natural hazards identified that were rated of negligible to no risk were not included in this plan. This annex therefore focuses on specific areas of vulnerability the City of Murphy faces with each hazard. The hazards identified earlier in the plan are all addressed in this annex.

Dam and Levee Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations. The City of Murphy is not subject to dam failure because no Dams are located inside the city limits and the city is not vulnerable to a dam failure that might occur outside the city limits. As a participant in the county plan inundation studies will be considered.

Drought The City of Murphy is a moderate risk for drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Murphy are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. The City of Murphy receives its water supply from the North Texas Municipal Water District (NTMWD). Restrictions sanctioned on the City of Murphy by the NTMWD caused by a drought affect local revenues significantly. The lack of water can also impact emergency responder capabilities in the form of firefighting efforts (not facilities). Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuing seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Due to the risk being associated to a distant quake, earthquakes may affect the entire planning area equally. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

There is no history of earthquakes occurring within the City of Murphy; however, there have been six (6) earthquake activity events between1997 – 2008. Those ranged from 27.3 miles to 96.7 miles away from the city center. There have also been hundreds of small earthquakes recently in North Texas possibly from the gas and oil industry drilling and disposal known as fracking. Venture companies continue to look for new drill sites in this general area.

The City of Murphy is a low risk for an earthquake. The most likely risk to a significant earthquake event is associated to either a distant larger quake which might occur in Missouri, Tennessee, or Oklahoma, though these earthquakes are probable to occur only once every 500 years.

Expansive Soils Expansive soils contain minerals such as “smectite” clays that are capable of absorbing water. When they absorb water they increase in volume. The more water they absorb the more their volume increases. Expansions of ten percent or more are not uncommon. This change in volume can exert enough force on a building or other structure to cause damage. Expansive soils will also shrink when they dry out. This shrinkage can remove support from buildings or other structures and result in damaging foundations. Fissures in the soil can also develop. These fissures can facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures, especially those constructed under older building codes. The City of Murphy is a low risk for expansive soils.

Extreme Heat Extreme heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat can also be a factor that drastically impacts drought conditions as high temperatures lead to an increased rate of evaporation. Extreme heat can also lead to heat stroke and even death in vulnerable populations such as the homeless, elderly, very young, and populations without air conditioning if exposed to the high temperatures for an extended period of time. Extreme heat may affect the entire population equally.

The City of Murphy is a moderate risk of extreme heat. The City of Murphy has the potential during heat emergencies to exceed capabilities of our local hospitals and Emergency Medical System. Extreme heat happens regularly and often for extended periods of time during the June through September timeframe.

Flooding Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “25-year storm” and “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” most often refers to an area that is subject to inundation by a flood that has a one percent chance of occurring in any given year (commonly and incorrectly referred to as the 100-year floodplain). Common flooding hazards within the planning area include flood hazards from flash flooding and from new development.

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the

collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains, hurricanes, and tropical storms. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges.

The City of Murphy is a low risk for flooding. There are a few homes currently lying within a flood plain within the City of Murphy. A large creek system dissects the city basically in half and abuts approximately 30% of all neighborhood subdivisions. The city only houses one fire station. Emergency responses may be severely impacted when attempting to respond to the other side of the creek with flooding present.

Hail Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. Hail may affect the entire planning area equally. Exposed populations, manufactured homes, and older properties are most vulnerable.

The City of Murphy is a low risk for hail. The City of Murphy covers a small area with a higher population ratio than the more rural areas in Collin County. All areas of the city are susceptible to hail damage. Damage in the city due to hail could result in a much higher loss due to density.

High Winds Wind is defined as the motion of air relative to the earth's surface. The horizontal component of the three-dimensional flow and the near-surface wind phenomenon are the most significant aspects of the hazard. Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds may affect the entire planning area equally.

The City of Murphy typically has power outages, fires, damage to roofs, cars, out buildings, and electrical utilities due to high winds. These events create significant planning and recovery issues. The City of Murphy is a low risk for high winds. The City of Murphy has and encourages a high density of trees with the city limits. High winds create a lot of power outages due to tree limbs compromising such power lines and also creates a Significant vegetative debris is generated during high wind events that requires removal to keep roads passable.

Lightning Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A "bolt" or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes.

Bolts of lightning can reach temperatures approaching 50,000° Fahrenheit. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. Federal Emergency Management Agency states that an average of 300 people are injured

and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. Property without lightning protection and exposed populations are most vulnerable. The City of Murphy is a low risk for lightning.

Tornado A tornado is a violently rotating column of air, in contact with the ground, both pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel. Tornadoes may affect the entire planning area equally, manufactured homes and exposed populations are most vulnerable.

The City of Murphy is a low risk for tornado activity. Tornados are likely to occur within the City of Murphy as they are within any other area in Collin County. Special issues concerning a tornado incident within the City are due to a population density of 3,596 per square mile. An additional concern is the vast numbers of large trees in the residential areas that could impact power lines and the restriction into areas needing assistance due to trees and limbs blocking roadways.

Wildland Fire Wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildland fires are fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted. Wildland fires affect the entire planning area equally. For the purposes of this hazard analysis, wildland fires are assessed under what is known as the Wildland Urban Interface (WUI). The WUI is an area of development that is susceptible to wildland fires due to the amount of structures located in an area with vegetation that can act a fuel for a wildland fire.

The City of Murphy is a low to moderate risk for wildland fire. 47.54% of Murphy's population lives in the Wildland Urban Interface which is predominately in the north and east sides of the city, according to the Texas Forest Service Wildfire Risk Assessment Summary.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. Winter storms affect the entire planning area equally. Cold snaps in which temperatures fall below the freezing point of 32° Fahrenheit do happen on an annual basis in the planning area and can lead to issues with infrastructure, especially frozen roads and bridges.

Winter storms affect the entire City of Murphy when they occur and have multiple impacts including, but not limited to travel, power, and exposure for the homeless, elderly, and populations without access to heat. With the potential for freezing precipitation, icing of roadways are of an utmost concern. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. The city has two state highways, FM 544 and FM 2551 that can be impacted during winter storms. Areas impacted include local commerce, exceeding the capabilities of our local hospital, over

extending local capabilities to shelter stranded motorist. The City of Murphy serves as a cross connection point between IH 30 and US Highway 75 and is a major thoroughfare. The vehicle count for FM 544 alone is approximately 50,000 cars per day. With a very high tree population within the city; public works, fire and police departments are overwhelmed with the impacts caused by the loss of limbs associated with severe weather.

Identification of Assets and Vulnerability Assessment

An inventory of the City of Murphy geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by the 2020 NCTCOG Population Estimates.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates, the total population of the City of Murphy in 2020 was 20,500 people, with 6,179 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4 Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Murphy	20,500	1.98%	3,605.63	7,211	1.88%	1,269.59

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Murphy).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2013-2014	Percent (%) Change 2013-2014
City of Murphy	17,708	20,060	20,080	20	0.09%

Source: 2020 North Central Texas Council of Governments Population Estimate

Property

There are an estimated 7,077 parcels in the City of Murphy, with an estimated $2,065,761,767 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Murphy	7,077	1.68%	$2,065,761,767

Source: Collin County Appraisal District

Emergency Facilities

There are three identified emergency facilities in the City of Murphy, including one fire station, one police station, and no hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Murphy	1	1	1

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are five critical facilities, which are considered non-emergency in the City of Murphy. The critical facilities include five schools and zero historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Murphy	5	0

Source: Local jurisdictions

Critical Infrastructure

There are five identified critical infrastructure facilities in the City of Murphy, including no airports, no natural gas facilities, no water treatment facilities, no wastewater treatment facilities, no dams, and five railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Murphy	0	0	0	0	0	5

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Murphy's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Murphy, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	

Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Murphy are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Murphy are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Murphy. The City of Murphy and its population are vulnerable to this hazard.

Improved Property	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to developed areas and the improved property in the City of Murphy; predominantly a residential community, is vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is zero (0) impact of extreme heat to emergency facilities; however, there are two standalone emergency room facilities, one fire station, one police station and one animal shelter in the City of Murphy which are vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there are zero (0) critical facilities; however, there are five school facilities in the City of Murphy which are vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is zero (0) impact of extreme heat to critical infrastructure, and exposure; however, there are four bridges within the City of Murphy and the risk is considered minimal..

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 185 residential parcels in the City of Murphy are located within the 100-year floodplain.
Improved Property	There have been six (6) recorded flood events in the City of Murphy. Property losses are expected at $23,573.70 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $65,866,390 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Murphy are expected at $2,028.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although

	some crops are susceptible to hail hazards, available historical data for the City of Murphy indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Murphy are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Murphy are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Murphy are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Murphy is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Murphy are expected at $785.71 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Murphy.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Murphy are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Murphy are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Murphy are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no fatalities or injuries in City of Murphy. All the population of the City of Murphy is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Murphy are expected at $14,791.67 per year

	however these values are underestimated due to lack of accurate reporting. Murphy is exposed to this hazard.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Murphy are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Murphy are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Murphy are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Murphy. All the population of the City of Murphy is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the City of Murphy are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the City of Murphy.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Murphy are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Murphy are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Murphy are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 47.54% of the City of Murphy is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Murphy are also unknown.

Emergency Facilities	Based on geographic information there are 0 fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facility, and 0 water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Murphy. All the population of the City of Murphy is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Allen are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Murphy. With significant ice storms for this area the City of Murphy is exposed and vulnerable to this hazard.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Murphy are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Murphy are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Murphy are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Murphy considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
City of Murphy	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	**64%**
Average % Yes Capabilities – 64%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Murphy	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	90%
Average % Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
City of Murphy	N	Y	Y	Y	Y	Y	Y	N	N	N	**60%**
Average % Yes Capabilities – 60%											
Y- Yes N- No ?- Don't Know											

To quantify Collin County's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the City of Murphy has 64% of identified legal and regulatory capabilities, 90% of identified administrative and technical capabilities, and 60% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Murphy	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2021 HazMAP, the City of Murphy Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.
Objective 1-D Reduce or eliminate loss of life and property damage from tornado, ice events, power outages and high winds through tree pruning practices.
Objective 1-E Reduce or eliminate loss of life and property damage from drought through urban interface practice due to wildfires.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.
Objective 2-F Provide ample supply of fuel for all city vehicles and public safety vehicles for emergency responses.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within the City of Murphy.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.

Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Murphy Deferred Items from 2016 Plan

City of Murphy Action Item	Increase the percentage of population covered by Outdoor Warning Sirens by relocating one siren and purchasing and installing an additional siren.
Hazard(s) Addressed	Tornado, High Winds, Hail
Goal/Objective	1-B
Priority	High
Estimated Cost	$38,000
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Fire/OEM
Implementation Schedule	6-18 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The city has four tower sites currently, but has a gap in coverage in some areas. Relocating an existing site and adding one site would allow full coverage for the city and its residents.

Status	100% Complete

City of Murphy Action Item	Obtain portable generators to ensure continuity of operations at critical facilities.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Hail, Earthquake, Lightning, Dam Failure
Goal/Objective	1-E
Priority	High
Estimated Cost	$7,500 each
Potential Funding Sources	HGMP, HMA, General Fund
Potential Matching Sources	Local, In-kind
Lead Department	Fire
Implementation Schedule	3-6 Months
Effect on Old Buildings	Would require retrofit for generator hookups
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective
Discussion	Natural hazards can create power outages for extended periods of time.
Status	Not started and no longer a viable action item. Will be removed from Plan

City of Murphy Action Item	Purchase and Install CASA-WX Weather Radar
Hazard(s) Addressed	Tornado, High Winds, Hail
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$2.5 Million
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Fire/OEM
Implementation Schedule	3-6 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The more accurate data will

	also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.
Status	No longer a viable project for Murphy, will be removed from Plan in 2021

City of Murphy Action Item	Implement the Residential Safe Room Rebate Program locally
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1-C
Priority	Medium
Estimated Cost	$3,000 per safe room
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	City Council – City Manager
Implementation Schedule	1-3 years
Effect on Old Buildings	Some buildings may be modified for shelter retrofit
Effect on New Buildings	New home construction would result in safer houses
Cost Effectiveness	Moderate: Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornados or high winds events.
Discussion	Support the existing active FEMA 320 safe room rebate program for North Central Texas by helping offset the cost to the resident.
Status	With the ending of the NCTCOG Saferoom Rebate Program this program is no longer a viable action item. Will be removed from Plan.

City of Murphy Action Item	Develop and implement seasonal program for identifying and removing tree limbs that threaten infrastructure.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, High Winds, Lightning
Goal/Objective	1-D
Priority	Medium
Estimated Cost	$25,000
Potential Funding Sources	HGMP, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Parks
Implementation Schedule	3-6 Months

Effect on Old Buildings	Reduce potential for power line/debris/limb damage to existing buildings during extreme weather
Effect on New Buildings	Reduce potential for power line/debris/limb damage to new construction during extreme weather
Cost Effectiveness	Very cost effective in mitigating tree limbs prior to severe weather events.
Discussion	Severe storms, winter storms, and wildfires damage tree limbs and power lines that damage homes, buildings, vehicles and create power outages when they fall. Roads become impassable due to the obstructions created by the falling limbs and charged power lines as well. The ability to mitigate these overgrowth items and strategically located limbs will lessen the effects of the hazards.
Status	Completed

City of Murphy Action Item	Retrofit the existing Emergency Operations Center to harden it against multiple hazards
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	2-B
Priority	High
Estimated Cost	$30,000-$150,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, In-kind, Bond
Lead Department	Public Works
Implementation Schedule	12 – 24 months
Effect on Old Buildings	Existing building would be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	N/A
Cost Effectiveness	Low cost effectiveness for construction, but very cost effective for ‘command structure’ to remain intact to operate through emergency events
Discussion	Dry floodproofing ground floor; reinforcing doors and windows; installing flame-retardant, hail and wind resistant external materials (window coatings, roofing); roof bracing; higher grade insulation; foundations stabilizers; lightning rods; soil stabilizing plants, and low-flow plumbing.
Status	Partially completed and will continue to perform enhancements. Will be included in 2021 Plan.

City of Murphy Action Item	Replace undersized culverts at five locations.

Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$620,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained
Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 5 separate projects that have been identified as insufficient.
Status	Mostly completed and will be included in 2021 Update

City of Murphy Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages

Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	No longer a viable project for Murphy, will be removed from Plan in 2021

City of Murphy Action Item	Drainage channel improvements and additions.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$3.11 Million
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	12 – 18 Months
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained
Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 4 separate projects that have been identified as insufficient.
Status	Mostly completed and will be included in 2021 Update

City of Murphy Action Item	Purchase and install lightning detection equipment for city parks
Hazard(s) Addressed	Lightning
Goal/Objective	1-A
Priority	Moderate
Estimated Cost	$10,000
Potential Funding Sources	HGMP, PDM, General Fund
Potential Matching Sources	Local, in-kind
Lead Department	Public works
Implementation Schedule	12 months

Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very cost effective. Quantifying the value of a human life is extremely difficult at best.
Discussion	The city has two major parks with outdoor sporting event capabilities, pavilions and an amphitheater where multiple events are held throughout the year. Providing a secondary source of severe weather information such as lightning indication could prevent injury or death to one or more of our citizens or guests
Status	No longer a viable project. Will not be included in the 2021 Plan

City of Murphy Action Item	Develop and implement a water conservation plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and protection of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation and work with local water supplies to increase mitigation measures for drought. Develop and implement mandatory water restrictions/codes for water conservation measures that address soil stabilization.
Status	100% Completed

City of Murphy New 2021 Action Items

City of Murphy Action Item	Retrofit the existing Emergency Operations Center to harden it against multiple hazards
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning
Goal/Objective	2-B
Priority	High

Estimated Cost	$30,000-$150,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, In-kind, Bond
Lead Department	Public Works
Implementation Schedule	12 – 24 months
Effect on Old Buildings	Existing building would be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	N/A
Cost Effectiveness	Low cost effectiveness for construction, but very cost effective for 'command structure' to remain intact to operate through emergency events
Discussion	Dry floodproofing ground floor; reinforcing doors and windows; installing flame-retardant, hail and wind resistant external materials (window coatings, roofing); roof bracing; higher grade insulation; foundations stabilizers; lightning rods; soil stabilizing plants, and low-flow plumbing.

City of Murphy Action Item	Replace undersized culverts at five locations.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$620,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	1-2 years
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained
Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 5 separate projects that have been identified as insufficient.

City of Murphy Action Item	Drainage channel improvements and additions.
Hazard(s) Addressed	Flooding
Goal/Objective	2-A, 2-E
Priority	Moderate
Estimated Cost	$2.91 Million
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind, Bonds
Lead Department	Engineering
Implementation Schedule	12 – 18 Months
Effect on Old Buildings	Reduce flooding for existing structures in area
Effect on New Buildings	Reduce flooding for planned construction in area
Cost Effectiveness	Very effective for the long term results gained
Discussion	Providing proper water flow and drainage during times of excessive rains is imperative. Improper water flow results in damage to roads, bridges and property; which may lead to injuries and deaths. These replacements will be for 4 separate projects that have been identified as insufficient.
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation and work with local water supplies to increase mitigation measures for drought. Develop and implement mandatory water restrictions/codes for water conservation measures that address soil stabilization.

City of Murphy Action Item	Obtain fixed emergency building generators and complete the electrical wiring to retrofit the existing buildings for critical infrastructure buildings
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning
Goal/Objective	2-B, 2-D
Priority	High
Estimated Cost	$20,000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, in-kind
Lead Department	Public Works
Implementation Schedule	12-18 months
Effect on Old Buildings	Existing building would be retrofitted to prevent shutdown of building
Effect on New Buildings	N/A
Cost Effectiveness	Moderate
Discussion	Tornados, High winds, extreme heat and ice (winter storm) create power outages for extended periods of time. People become trapped in their

	homes without power for heating and cooling needs and other necessities for extended periods of time. These elements will provide electricity to the buildings and it will allow the critical components of the building to still operate. These structures would allow for them to serve as warming and cooling shelters

City of Murphy Action Item	Install fuel tanks, fuel pumps, roadway, and all appurtenances for city vehicle refueling needs during emergency responses.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Hail, Drought, Earthquake, Lightning
Goal/Objective	2-F
Priority	Moderate
Estimated Cost	$1.75 Million
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local, In-kind, Bond
Lead Department	Public Works
Implementation Schedule	12 – 24 months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Very effective for the long-term results gained
Discussion	When fuel shortages result from local, state, or national events, we lose our may lose our ability to quickly respond to events. This would include not just traditional first responders, but also Public Works and others. Ensuring we maintain our own fuel and ability to fill up vehicles will help ensure we can mitigation events here in Murphy due to us having the ability to respond at all times.

City of Murphy Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	TBD
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local funds, in-kind, citizen cost share
Lead Department	Economic Development, Public Works
Implementation Schedule	2-4 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage

Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage
Cost Effectiveness	Moderate. This study could lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout the jurisdiction.

City of Murphy Action Item	Research and develop an urban interface wildfire program for residents
Hazard(s) Addressed	Drought
Goal/Objective	1-E
Priority	Moderate
Estimated Cost	$1000 - $5000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local funds, in-kind, citizen cost share
Lead Department	Parks & Fire Department
Implementation Schedule	1-2 years
Effect on Old Buildings	Reduce property damage due to increased wildfire risk
Effect on New Buildings	Reduce property damage due to increased wildfire risk
Cost Effectiveness	Low-moderate cost for effective means to reduce wildfire risk
Discussion	Drought in general leads to an increased chance of wildfire. With most wildfire loss occurring in open undeveloped wildlands there is still a moderate chance of wildfire in smaller areas of developed urban areas of high population. Specific clearing of underbrush and debris near homes and businesses will reduce the property damages due to wildfire.

City of Murphy Action Item	Implement all-hazards community education program, including information on mitigation activities.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning
Goal/Objective	4A- 4B
Priority	High
Estimated Cost	$1000 - $5000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Emergency Management
Implementation Schedule	2-4 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing buildings safer, stronger, and less vulnerable to damages by providing a qualitative understanding of hazards and how to mitigate them.
Effect on New Buildings	Depending on mitigation actions taken for structures, can make existing buildings safer, stronger, and less vulnerable to damages by

	providing a qualitative understanding of hazards and how to mitigate them.
Cost Effectiveness	Low-cost effectiveness for providing information to citizens to make good sound decisions based on current practices for mitigation.
Discussion	Community education is important for reducing loss of life and property.

City of Murphy Action Item	Continue to enhance mandatory water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-A
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with localwater supplies to increase public education on drought. Develop and implement mandatory water restrictions for water conservation. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

National Flood Insurance Program (NFIP) Compliance

The City of Murphy is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480137#	MURPHY, CITY OF	COLLIN COUNTY	12/7/1973	4/1/1980	6/2/2009	4/1/1980	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Murphy	City Manager	Maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the City Manager's Office. City of Murphy requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
		Floodplain development permits	Permits are required for any construction in a floodplain.	
		Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	City of Murphy Street Department distributes barricades during times of flooding events.	
		Future Mitigation Projects	City of Murphy will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Murphy, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, The City of Murphy will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Jurisdiction	Personnel	Activity	Time
City of Murphy	Fire Marshal	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
		Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
		Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will

undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Murphy	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Specialist	Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Murphy Hazard Mitigation Planning Team considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex O: Town of New Hope

1. Introduction

This annex was prepared in 2020-2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The Town of New Hope participated on the Collin County Hazard Mitigation Planning Team (HMPT). The New Hope annex contains information specific to the town, including capability assessment information, vulnerability assessments, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the Town of New Hope has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped New Hope officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and the local newspaper.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), the Town of New Hope developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface

National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Town of New Hope Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT. The efforts of the Planning Committee were led by the Mayor.

The Collin County HMPT was assembled in June 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services. The efforts of the planning committee were led by the mayor of New Hope. The table below provides a list of the primary representatives on the New Hope planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Town Council	Mayor	Plan Development
Town Council	Council Members	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.

- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Collin County	Assistant Emergency Management Coordinator	General Assistance

Subsequent to the State of Texas and FEMA approval of the plan, each jurisdiction also is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County:

- Collin County HazMAP Kickoff Meeting – November 5, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption. This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the Town of New Hope identified several hazards that could affect the town. The committee decided to focus on the natural hazards identified on pages O-9 through O-10 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the Town of New Hope and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the Town of New Hope

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	1	0	0	0.35
Drought	1	0	0	0	0.3
Earthquake	0	0	0	2	0.2
Expansive Soils	1	0	0	1	0.4
Extreme Heat	2	1	0	2	1.15
Flooding	1	0	0	1	0.4
Hail	2	1	0	2	1.15
High Winds	2	0	0	1	0.7
Lightning	2	0	0	0	0.6
Tornado	2	2	2	1	1.9
Wildfire	1	1	1	1	1
Winter Storms	2	1	2	3	1.75

The conclusions drawn from the hazard profiling process for Collin County jurisdictions, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Collin County.

Table 3.3 Hazard Rankings for the Town of New Hope

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Winter Storms Extreme Heat Hail
Low Risk (PRI 0.50 – 1)	High Winds Lightning Wildfire
Negligible to No Risk (PRI 0 – 0.49)	Earthquake Dam Failure Drought Expansive Soils Flooding

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the Town of New Hope faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure As a participant in the county plan inundation studies will be considered. There are currently no dams in or immediately surrounding New Hope.

Drought Droughts have the potential to impact the entire planning area equally: all improved property and the entire population of New Hope are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. North Texas Municipal Water District (NTMWD) is the source of water for the Town of New Hope, and NTMWD's water sources and reservoirs are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils All the geographic areas and properties in the Town of New Hope have the potential to be vulnerable to expansive soils, especially properties constructed under older building codes. Expansive soils are not a prevalent hazard in New Hope.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding Geographic areas, properties, and populations in the Town of New Hope have the potential to be vulnerable to flooding. Areas around Big Branch Creek are vulnerable to flooding and roadways with poor drainage are vulnerable to flash flooding.

Hail All the geographic areas, properties, and populations in the Town of New Hope have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds High winds have the potential to damage trees in the Town of New Hope. Because roads and houses in New Hope are surrounded by large trees, high winds have the potential to block roads and damage houses. Manufactured homes and exposed populations are most vulnerable.

Lightning All the geographic areas, properties, and populations in the Town of New Hope have the potential to be vulnerable to lightning. Buildings without lightning protection and exposed populations are most vulnerable.

Tornado All the geographic areas, properties, and populations in the Town of New Hope have the potential to be vulnerable to tornados. Manufactured homes and exposed populations are most vulnerable.

Wildland Fire 91.43% of the population of the Town of New Hope lives in the Wildland/Urban Interface. Both the east and west side of New Hope are vulnerable to wildland fires because of their WUI and because of their distance from a main highway (Hwy 380).

Winter Storms Winter storms are a significant threat to the Town of New Hope. These winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. New Hope residents live a distance from major stores and may be unable to buy supplies in the event of a prolonged storm or power outage.

Identification of Assets and Vulnerability Assessment

An inventory of unincorporated Collin County geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census Bureau Annual Estimates of the Resident Population for Incorporated Places: April 1, 2010 to July 1, 2019.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools, Town Halls, and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population. The New Hope Town Hall could act as an Emergency Operations Center (EOC) in the event of a major emergency or disaster.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical infrastructure was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the *US Census Bureau Annual Estimates of the Resident Population for Incorporated Places: April 1, 2010 to July 1, 2019*, the total population of the Town of New Hope in 2019 was 628 people, with 276 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. New Hope Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Town of New Hope	628	0.06	436.11	276	0.09	191.67

Source: 2020 NCTCOG Population Estimate and US Census Bureau Annual Estimates of the Resident Population for Incorporated Places: April 1, 2010 to July 1, 2019 & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the Town of New Hope).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Town of New Hope	614	633	628	-5	-0.79%

Source: 2010 Census Data & US Census Bureau Annual Estimates of the Resident Population for Incorporated Places: April 1, 2010 to July 1, 2019

Property

There are an estimated 380 parcels in the Town of New Hope, with an estimated $55,290,291 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
Town of New Hope	380	0.10%	$55,290,291

Source: Collin County Appraisal District

Emergency Facilities

There are zero identified emergency facilities in the Town of New Hope*(Table 3.*7).

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Town of New Hope	0	0	0

Source: FEMA Resilience and Planning Tool

Critical Facilities

There is one identified critical facility in the Town of New Hope *(Table 3.8)*.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Town Hall	Historical Property
Town of New Hope	0	1	0

Source: FEMA Resilience and Planning Tool & Local jurisdictions

Critical Infrastructure

There are zero identified critical infrastructure facilities in the Town of New Hope (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Town of New Hope	0	0	0	0	0	0

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the Town of New Hope's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the Town of New Hope, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. Table 3.10 summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the Town of New Hope are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.

Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities, but foundation issues could occur due to drought events.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the Town of New Hope. The Town of New Hope and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the Town of New Hope is not vulnerable to this hazard.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	According to the National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the Town of New Hope are not vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Portions of two (2) residential parcels in the Town of New Hope are located within the 100-year floodplain.
Improved Property	Property losses in the Town of New Hope are expected but financially unknown due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $194,858 of the total assessed value is at risk from the 100-year storm event
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Critical facilities have the potential to be at risk in a 100 year storm event.

Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but unknown due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data indicates that there are no expected crop losses from this event.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the Town of New Hope are vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events county-wide. All the population of the Town of New Hope is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but unknown due to lack of accurate reporting. Minimal crop losses resulted from this hazard county-wide with none reported from the Town of New Hope.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the Town of New Hope are vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no fatalities or injuries. All the population of the Town of New Hope is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but unknown due to lack of reporting. No crop losses resulted from this hazard county-wide with none reported from the Town of New Hope.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the Town of New Hope are vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the Town of New Hope. All the population of the Town of New Hope is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but financially unknown due to lack of reporting. No crop losses resulted from this hazard county-wide with none reported from the Town of New Hope.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornadoes, all critical facilities in the Town of New Hope are exposed and vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.18

Wildfire	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from wildfires in the Town of New Hope. Based on geographical data, approximately 91.43% of New Hope is vulnerable to wildfires.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but financially unknown due to lack of reporting. No crop loss reported from the Town of New Hope. Therefore, percentage of the overall property improvement values across the Town of New Hope are also unknown.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk.
Critical Facilities	Based on geographic information, there is one critical facility at risk from wildfire events.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the Town of New Hope. All the population of the Town of New Hope are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of New Hope are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the Town of New Hope.
Emergency Facilities	There are no emergency facilities located within the Town of New Hope. Therefore, no emergency facilities are at risk
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the Town of New Hope are exposed and vulnerable to this hazard.
Critical Infrastructure	There is no critical infrastructure located within the Town of New Hope. Therefore, no critical infrastructure is at risk.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, New Hope considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
Town of New Hope	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	?	**50%**
Average % Yes Capabilities – 50%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Town of New Hope	N	N	N	N	N	N	N	N	N	Y	**10%**
Average % Yes Capabilities – 20%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Town of New Hope	N	N	Y	N	N	N	N	N	N	?	**10%**
Average % Yes Capabilities – 10%											
Y- Yes N- No ?- Don't Know											

To quantify New Hope's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, New Hope's and its jurisdictions have 50% of identified legal and regulatory capabilities, 10% of identified administrative and technical capabilities, and 10% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Town of New Hope	Mayor	The Town Council, including the Mayor, Mayor Pro-Tem, and Town Council members, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the overall direction of the Town.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2011 HazMAP, the Town of New Hope Hazard Mitigation Planning Committee developed mitigation strategies for the Plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones within New Hope.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

Town of New Hope Deferred Items from 2016 Plan

Town of New Hope Action Item	Adopt and promote public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds General fund
Lead Department	Town Council
Implementation Schedule	Yearly effort
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	The utilization of social media will be key in this program. Program will include educational information about hazard awareness and mitigation.

Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan

Town of New Hope Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornado/High Winds
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Residents receiving grant
Lead Department	N/A
Implementation Schedule	1-3 Years
Effect on Old Buildings	Enhance Safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelter potentially decrease personal injuries and death during severe weather, tornados, or high wind events
Discussion	
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of New Hope Action Item	Develop and Implement an extreme temperature program that identifies both locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2D
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General fund
Lead Department	Town Council
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources, including but not limited to emergency generators.
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.

Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	Low
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Partial payment by receiving party
Potential Matching Sources	Local funds, General Fund, citizen cost-share
Lead Department	Town Council
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios could be especially useful to provide information about severe weather as well as provide other emergency and hazard information to residents without use of their cell phones or access to Internet.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	Medium
Estimated Cost	$25,000 per siren
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General Fund, Developer cost
Lead Department	Town Council

Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens notified of hazards.
Discussion	Obtaining grants will be key to implementation of outdoor warning siren coverage due to high costs and New Hope's ow fiscal capability assessment scores.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the County.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2-A, 3-A
Priority	Low
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Identify all structures and infrastructures that would be impacted by a potential dam failure. There are currently no dams located in or immediately surrounding New Hope.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	HMGP, PDM

Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show town officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	With assistance from Collin County Fire Marshall, identify mitigation strategies for all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought
Goal/Objective	3-C, 4-B
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on North Collin Special Utility District recommendations. Use of social media will be key in implementing this plan.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	4-B
Goal/Objective	Earthquake

Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A,
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Funds
Lead Department	Town Council
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction. Expansive soils are not prevalent in New Hope.
Status	Deferred – will be included in 2021 Plan

Town of New Hope Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds General fund
Lead Department	Town Council
Implementation Schedule	Yearly effort
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	The utilization of social media will be key in this program. Program will include educational information about hazard awareness and mitigation.

Town of New Hope New 2021 Action Items

Town of New Hope Action Item	Develop and implement storm water management
Hazard(s) Addressed	Flooding
Goal/Objective	2-D, 2-E,3-C
Priority	Low
Estimated Cost	$75,000
Potential Funding Sources	HMGP PDM
Potential Matching Sources	Local Grants, General Fund
Lead Department	Town Council
Implementation Schedule	1-3 years
Effect on Old Buildings	May prevent flooding of existing structures
Effect on New Buildings	May prevent flooding of new development.
Cost Effectiveness	Low compared to life safety events.
Discussion	Project would prevent erosion

Town of New Hope Action Item	Develop and Implement an extreme temperature program that identifies both locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2D
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General fund
Lead Department	Town Council
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources, including but not limited to emergency generators.
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

Town of New Hope Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMPG, Partial payment by receiving party
Potential Matching Sources	Local funds, General Fund, citizen cost-share
Lead Department	Town Council
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.

Discussion	Weather Alert Radios could be especially useful to provide information about severe weather as well as provide other emergency and hazard information to residents without use of their cell phones or access to Internet.

Town of New Hope Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A
Priority	Medium
Estimated Cost	$25,000 per siren
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds, General Fund, Developer cost
Lead Department	Town Council
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens notified of hazards. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.
Discussion	Obtaining grants will be key to implementation of outdoor warning siren coverage due to high costs and New Hope's ow fiscal capability assessment scores.

Town of New Hope Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the County.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2-A, 3-A
Priority	Low
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones

Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Identify all structures and infrastructures that would be impacted by a potential dam failure. There are currently no dams located in or immediately surrounding New Hope.

Town of New Hope Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	18 – 36 months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show town officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	With assistance from Collin County Fire Marshall, identify mitigation strategies for all structures and infrastructures that would be impacted by a potential wildfire.

Town of New Hope Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C, 4-B
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	12 - 18 months

Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on North Collin Special Utility District recommendations. Use of social media will be key in implementing this plan. Ensuring residents have sufficient water to keep their foundations at a consistent saturation rate will mitigate droughts and drying soils which is a result of expansive soils of our region.

Town of New Hope Action Item	Develop and implement debris management program targeting buildup of debris and materials at bridges built over metal culverts that could result in flooding and damage to roadways.
Hazard(s) Addressed	2-E, 3-C
Goal/Objective	Flooding
Priority	Low
Estimated Cost	$500,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local, General Fund
Lead Department	Town Council
Implementation Schedule	12 months – 18 months
Effect on Old Buildings	Could prevent flooding and disruption to transportation
Effect on New Buildings	Could prevent flooding and disruption to transportation
Cost Effectiveness	Low compared to benefits
Discussion	The Town of New Hope needs to ensure clear pathways for the flow of stormwater to prevent buildup of debris and materials that could cause flooding and possible damage to roadways and bridges.

Town of New Hope Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils.
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A,
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	HMGP

Potential Matching Sources	Local, General Funds
Lead Department	Town Council
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction. Expansive soils are not prevalent in New Hope.

Town of New Hope Action Item	Implement all-hazards community education program, including information on mitigation activities.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4A- 4B
Priority	High
Estimated Cost	$1000 - $5000
Potential Funding Sources	HGMP, PDM, HMA, General Fund
Potential Matching Sources	Local funds, in-kind
Lead Department	Emergency Management
Implementation Schedule	2-4 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing buildings safer, stronger, and less vulnerable to damages by providing a qualitative understanding of hazards and how to mitigate them.
Effect on New Buildings	Depending on mitigation actions taken for structures, can make existing buildings safer, stronger, and less vulnerable to damages by providing a qualitative understanding of hazards and how to mitigate them.
Cost Effectiveness	Low-cost effectiveness for providing information to citizens to make good sound decisions based on current practices for mitigation.
Discussion	Community education is important for reducing loss of life and property.

National Flood Insurance Program (NFIP) Compliance

New Hope is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480138#	NEW HOPE, TOWN OF	COLLIN COUNTY	-	1/19/1996	06/02/09(M)	4/19/1996	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Town of New Hope	Town Secretary	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the Town Hall. New Hope requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Ordinance	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with Town's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	New Hope participates in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	
		Future Mitigation Projects	New Hope will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the Collin County HMPT has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the Town of New Hope, the county, and the city/town council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) will be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the Town of New Hope will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Jurisdiction	Personnel	Activity	Schedule
New Hope	Mayor	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
		Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
		Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information and analyses and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented to the Collin County Commissioner's Court and councils for the incorporated municipalities included in the Collin County plan for approval. Likewise, each participating jurisdiction will undergo the same process for reviewing, revising and updating their respective plans and submitting same for state, federal and each jurisdiction's local governing body approval. The plan will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Town of New Hope	Town Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
		Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
		Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
		Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the New Hope Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex P: City of Parker

This annex was prepared in 2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Parker participated on the Collin County Hazard Mitigation Planning Team (HMPT). In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Parker. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

1. Introduction

The City of Parker is a residential community generally located at the northeast area of Dallas; we pride ourselves on large lots and open spaces. Parker is located at latitude 33°03'17N and longitude 96°37'17"W, and sits in the southern end of Collin County, with Allen to its North, Plano to the West, Murphy to the south, and Wylie to the east. The City of Parker was incorporated in 1969, and the home of the infamous Southfork Ranch. According to the North Central Texas Council of Governments (NCTCOG), the population of Parker is estimated to be about 5,000. The city has a total area of 10.1 square miles of land area. Parker is a "Type A" general law city which operates under a system of local government called Council - Manager, wherein all powers of the city are vested in the city council.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 (DMA 2000) implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Parker has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped City of Parker officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and jurisdictional websites.

In accordance with Part 201.6(c)(5) of the DMA 2000, Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. Data was gathered through numerous sources, and includes GIS, statistical and qualitative data. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface analysis
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Parker Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services; the efforts of the planning committee were led by the City of Parker Emergency Management Specialist. The table below provides a list of the primary representatives on the Parker planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City of Parker	Mayor	Plan Development
City of Parker	Mayor Pro-Tem	Plan Development
City of Parker	City Administrator	Plan Development
City of Parker	Police Chief	Plan Development
City of Parker	Fire Chief	Plan Development
City of Parker	Councilmember	Plan Development
City of Parker	City Attorney	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of

the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

Subsequent to the State of Texas and FEMA approval of the plan, each organization above is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
NCTCOG	Emergency Preparedness Prog. Asst.	Review of plan
Collin County	Homeland Security Dept. Coordinator	Review of plan

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdictions' participation:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – November 2, 2020

- Collin County Planning Meeting – November 5, 2020
- Collin County Kickoff Meeting – August 12, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Assessment and Risk Assessment

The Hazard Mitigation Planning Team Committee for the City of Parker identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this Update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards identified are provided in the City of Parker Hazard Identification and Risk Assessment (HIRA) as provided in Appendix A-1 of this annex.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Parker

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	3	0	1	3	1.45
Earthquake	0	0	0	0	0
Expansive Soils	2	0	1	1	0.95
Extreme Heat	2	0	0	0	0.6
Flooding	2	0	1	1	0.95
Hail	2	0	0	3	0.9
High Winds	3	0	1	1	1.25
Lightning	3	0	1	1	1.25
Tornado	3	1	1	1	1.6
Wildfire	1	0	1	1	0.65
Winter Storms	1	1	0	1	0.75

The conclusions drawn from the hazard profiling process for the City of Parker resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the City of Parker.

Table 3.3 Hazard Rankings for the City of Parker

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Drought
Low Risk (PRI 0.50 – 1)	Hail Expansive Soils High Winds Tornado Lightning Flooding Extreme Heat Wildfire
Negligible to No Risk (PRI 0 – 0.49)	Dam Failure Winter Storms Earthquake

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Parker faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure This hazard was identified as having negligible to no risk to the City of Parker. As a participant in the county plan inundation studies will be considered.

Drought Drought can have a significant impact on the City of Parker because of the large farming community. Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, agricultural community and the entire population of Parker are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for City of Parker and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. This hazard was identified as having negligible to no risk to the City of Parker. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils All geographic areas and properties have the potential to be vulnerable to expansive soils, especially facilities constructed under older building codes.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding The City of Parker can be affected by two types of floods though in limited areas. These include:

- Riverine Flood
  - Occurs in the floodplain of a river or stream when the amount of water and the rate at which the moving increases. This type generally can be forecast in advance, and proper precautions taken to save lives.
- Flash Flood
  - A type of Riverine flood that occurs after a heavy storm, when the ground cannot absorb the high amount of precipitation. This can occur when heavy precipitation falls on already-saturated soils. Flash Floods occur rapidly with little warning.
- Locations: Below are the descriptions of the areas in the City of Parker that are affected by flooding:

- The City of Parker has two major tributaries that run through or along the city and drains to Lake Ray Hubbard.
- The two are Maxwell Creek and Cottonwood Creek. Major flash floods may occur during heavy rains when the ground is saturated which would affect creeks and roadways.

Hail All geographic areas, properties and populations have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds All geographic areas, properties and populations have the potential to be vulnerable to high winds, manufactured homes and exposed populations are most vulnerable.

Lightning All geographic areas, properties and populations have the potential to be vulnerable to lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado All geographic areas, properties and populations have the potential to be vulnerable to tornadoes. Exposed populations, manufactured homes, and older properties are most vulnerable.

Wildland Fire According to the Texas A&M Forest Service, 64.66% of the population of the City of Parker live in the Wildland/Urban Interface. Additionally, due to the large amounts of farmland, the city is at elevated risk of wildfires.

Winter Storms All geographic areas, properties, and populations have the potential to be vulnerable to winter storms. Winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. The homeless, elderly, and populations without access to heat are most vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of Parker's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in the Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.

- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the US Census Bureau, the total population of the City of Parker in 2020 was 5,177 people, with 1,665 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total**	Household Density (Sq. Mile)
City of Parker	5,177	0.43%	557.01	1,665	0.43%	196.13

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for City of Parker).

Table 3.5 Population Predictions

County	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Parker	3,811	4,600	4,840	240	5.21%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 2,111 parcels in the City of Parker, with an estimated $465,566,442 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Parker	2,111	0.96%	$839,789,857

Source: Collin County Appraisal District

Emergency Facilities

There is two identified emergency facilities in the City of Parker, including one fire station, and one police station. *(Figure 3.18). Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Parker	1	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are one critical facilities, which are considered non-emergency in the City of Parker, *(Figure 3.19).* The critical facilities include no schools and one historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
City of Parker	1	1

Source: Local jurisdictions

Critical Infrastructure

There are one identified critical infrastructure facilities in the City of Parker, including no airports, no natural gas facilities, no water treatment facilities, no wastewater treatment facilities, no dams, and one railway/highway bridge (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Parker	0	0	0	0	0	1

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the City of Parker's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the City of Parker, four were analyzed using a Geographic Information System-based analysis, five using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. Table 3.10 summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Parker are expected mostly during water shortages, financially unknown due to lack of accurate reporting.

Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Parker. The City of Parker and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Parker is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is minimal impact of extreme heat to buildings and the emergency facilities in the City of Parker. The City of Parker is somewhat vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Parker are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is minimal impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Parker.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. About 230 residential parcels in the City of Parker are located within the 100-year floodplain.
Improved Property	There have been thirteen (13) recorded flood events in the City of Parker. Property losses are expected annually however these reported values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded county-wide.
Emergency Facilities	There are no emergency facilities at imminent risk from the 100-year storm event.

Critical Facilities	There are no critical facilities located within the 100-year storm event.
Critical Infrastructure	No % of railways/highways and bridges, no % of dams, no % of water treatment works, and no % waste water treatment facilities are at risk from the 100-year storm event. Many of these structures are designed to traverse or be located within the floodplain due to unavoidable circumstances. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected at $2,887,157.14 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Parker indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Parker are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Parker are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Parker are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All populations in the City of Parker are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected but unknown due to lack of accurate reporting. Unknown crop losses resulted from this hazard in the City of Parker.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Parker are vulnerable to this hazard.

Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Parker are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Parker are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from lightning events. All populations in the City of Parker are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected at $20,833.33 however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Parker are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Parker are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Parker are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in City of Parker. All populations in the City of Parker are exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in City of Parker.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Parker are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Parker are exposed and vulnerable to this hazard.

Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Parker are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data from Texas A&M Forest Service, a majority of the City of Parker is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting.
Emergency Facilities	Based on geographic information there is one fire station at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are no bridges, no dams, no wastewater treatment facility, and no water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Parker. All populations in the City of Parker are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Parker are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Parker.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Parker are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Parker are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Parker are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Parker considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
City of Parker	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	?	**85.7%**
Average % Yes Capabilities – 85.7%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
City of Parker	Y	Y	Y	Y	N	Y	Y	?	Y	N	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
City of Parker	N	Y	Y	Y	N	Y	N	N	N	N	**40%**
Average % Yes Capabilities – 40%											
Y- Yes N- No ?- Don't Know											

To quantify the City of Parker's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the City of Parker has strong identified legal and regulatory capabilities, strong identified administrative and technical capabilities, and moderate identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Parker	City Administrator	The city council, including the mayor, mayor pro-tem, and council members, along with the city administrator, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Parker Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate communication.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events**.

Objective 3-A Conduct a hazard/vulnerability assessment of properties and structures located in flood zones.
Objective 3-B Develop a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Parker Action Items: Deferred from 2016 Plan

City of Parker Action Item	Develop and implement a comprehensive public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	-
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	This public education program would be based on the hazards that the City of Parker identified as being vulnerable to. The program would use a combination of distributed literature, social media, and

	civic presentations to educate residents on natural hazards and promote hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Parker Action Item	Establish centers for vulnerable residents to mitigate the effects of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$5,000-$15,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling and heating shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Discontinued – Shelters will be opened in existing infrastructure as needed during incidents of extreme temperature,

City of Parker Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per shelter
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit

Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	This program gives rebates to residents who purchase and install safe rooms in their homes or on their properties to protect against severe weather.
Status	Discontinued – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

City of Parker Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$25,000 per siren, number of sirens TBD
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	9-12 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand Parker's siren coverage to new areas of development not currently protected by sirens.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2-A, 3-A
Priority	Medium
Estimated Cost	$50,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Planning

Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Discontinued – Dam Failure of Extremely low risk to City as none are present within city limits.

City of Parker Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify and mitigate all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind

Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing, soil conditioning around foundations
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Deferred – will be included in 2021 Plan

City of Parker Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Discontinued – Relevant studies for the region were conducted by reputable research institutions,

City of Parker Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000

Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Discontinued

City of Parker Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be modified and included in 2021 Plan

City of Parker Action Items: New

City of Parker Action Item	Establish outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$35,000 per siren, number of sirens TBD
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	36-48 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Discussion	This project will expand siren coverage to areas of development not currently protected by sirens. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Parker Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2-A
Priority	Medium
Estimated Cost	-
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	2-3 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Coordinate with TFS to Identify and mitigate all structures and infrastructures that would be impacted by a potential wildfire.

City of Parker Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C
Priority	Medium
Estimated Cost	-
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	12 - 18 months
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing, soil conditioning around foundations
Effect on New Buildings	May require new codes for low-flow plumbing and preservation of foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Coordinate with Parker Public Works to Develop a plan for conserving water based on the stages of drought. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Parker Action Item	Develop and Implement an Emergency Notification System
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	-
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of program Infrastructure.

Discussion	Utilize local Emergency alerting to warn citizens and provide information about severe weather as well as provide other emergency and hazard information

City of Parker Action Item	Develop and Implement a NIMS Training Program
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	-
Potential Funding Sources	NIMS Grants, General Fund
Potential Matching Sources	None
Lead Department	Fire Department
Implementation Schedule	12-24 months
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Low cost – Training is provided by National, State and Local Government Programs
Discussion	Utilize existing free training programs to bring training of city employees and volunteers that may respond to an emergency scene or EOC with the occurrence of an emergency or disaster affecting the City of Parker.

City of Parker Action Item	Implement all-hazards community education program, including information on mitigation activities.
Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	-
Potential Funding Sources	Local Funding
Potential Matching Sources	Local Grants, FEMA
Lead Department	Fire Department
Implementation Schedule	12-24 months

Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Educating public on mitigation against loss of life and property will save government resources in the event of a disaster event
Discussion	Community education is important for reducing loss of life and property.

City of Parker Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local funds General fund
Lead Department	Town Council
Implementation Schedule	Yearly effort
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	The utilization of social media will be key in this program. Program will include educational information about hazard awareness and mitigation.

City of Parker Action Item	Develop and Implement an extreme temperature program that identifies both locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-A, 2D
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP

Potential Matching Sources	Local funds, General fund
Lead Department	Town Council
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources, including but not limited to emergency generators.
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

National Flood Insurance Program (NFIP) Compliance

The City of Parker is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480139#	PARKER, CITY OF	COLLIN COUNTY	12/27/1977	08/15/1979	06/02/2009	08/15/1979	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Parker	City Administrator	Completing and maintaining FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	City Hall is responsible for issuing floodplain permits.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
		Requiring and maintaining FEMA elevation certificates for all new and improved buildings located in floodplains		
		Implementing damage reduction measures for existing buildings such as acquisition, relocation, retrofitting, and maintenance of drainage ways and retention basins	Maintenance of drainage ways and retention basins. Installation of retention basins on new construction.	
		Taking action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	Implementing newly developed Storm-water Management Program which includes public education, new development standards, and other programs and policies.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement *§ 201.6(c)(4)(i)*, the City of Parker has developed a plan maintenance process which is described in the following paragraphs. The City of Parker, along with participating jurisdictions are responsible for monitoring the implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by the City of Parker, the county, and the city council of each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Action Plan (HazMAP) would be implemented by participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the Hazard Mitigation Planning Team (HMPT), whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Collin County will provide information on the implementation status of each action included in the plan. As part of the annual monitoring, review and evaluation process, Collin County will provide reports regarding implementation actions and action completion dates for the plan. Also, as part of the evaluation, the HMPT will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	What	Time
Emergency Management Coordinator	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Parker	City Council, City Administrator	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	City Administrator , Police Chief, Fire Chief, Emergency Management Coordinator	Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, City Administrator	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Public Works Director, City Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Parker Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website.

The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

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Annex Q: City of Princeton

1. Introduction

This annex was prepared in 2021 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. The City of Princeton participated on the Collin County Hazard Mitigation Planning Team (HMPT) by representing the City of Princeton within the areas of the county. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Princeton. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, the City of Princeton along with local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Collin County has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Collin County and City officials recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

The City of Princeton participated in the comprehensive county wide approach that was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and o.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam information

Source	Data
City of Princeton Ordinance	Flood Plain Ordinance Ch. 34 Flood Prevention

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Princeton Hazard Mitigation Planning Committee, with support from the North Central Texas Council of Governments, Collin County and the HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public The Collin County Department of Homeland Security acted as the plan development consultant providing hazard mitigation planning services; the efforts of the Princeton planning committee were led by the City of Princeton Emergency Management Coordinator. The table below provides a list of the primary representatives on the Princeton planning committee.

Table 2.2 Planning Committee - Primary Representatives

Representing	Position	Role
Department of Emergency Management	Emergency Management Coordinator	Plan Development
Department of Engineering	City Engineer	Plan Development
Fire Department	Fire Chief	Plan Development
Police Department	Police Chief	Plan Development
Public Works Department	Public Works Director	Plan Development

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.

- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
City of Princeton Community Development Corporation	Board Member	Plan Review

Subsequent to the State of Texas and FEMA approval of the plan, these organizations are also committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the H met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – November 11, 2020
- Collin County Planning Meeting – June 12, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring

communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Princeton identified several natural hazards and man-made hazards that could affect the incorporated areas of the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Princeton and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Princeton to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%		Minor	Very few injuries, if at all none	0

	Life Impact	Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for Princeton

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	1	1	0.95
Extreme Heat	2	1	0	2	1.15
Flooding	3	1	2	1	1.85
Hail	2	0	1	1	0.95
High Winds	2	0	1	2	1.05
Lightning	1	0	1	1	0.65
Tornado	2	1	2	2	1.65
Wildfire	1	1	1	1	1
Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for the City of Princeton, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Princeton.

Table 3.3 Hazard Rankings for City of Princeton

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Extreme Heat Drought Tornado Flooding High Winds Winter Storm
Low Risk (PRI 0.50 – 1)	Expansive Soils Lightning Wildfire Hail
Negligible to No Risk (PRI 0 – 0.49)	Dam Failure Earthquake

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Princeton faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations.

The City of Princeton has not identified any dams that present a hazard at this time, but as a participant in the county plan inundation studies will be considered.

Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Princeton are vulnerable to

this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Princeton and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuring seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Even though rated negligible risk, the entire geographic planning area, properties, and populations have the potential to be vulnerable to earthquakes. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils Expansive soils, also referred as swelling soils, are those soils which have tendency to increase in the volume whenever the moisture content (i.e. water content) in it is increased. Foundation with swelling soil will heave and can cause lifting of a building or structure laid on it whenever the moisture content rises. This can ultimately lead to the failure of foundation and structure laid on it. They swell when water is added to them and shrink when they dry out. The entire geographic planning area, properties, and populations have the potential to be vulnerable to expansive soils, especially buildings constructed under older building codes.

Extreme Heat Severe summer heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding The City of Princeton has identified several low water crossings that are subject to periodic flash flooding. Affected areas differ with each storm as there are several different branches and tributaries of rivers and creeks subject to overflow, and also are dependent upon which area receives the rain. These areas are low water crossings mainly on older city streets and roads that have drainage ditches adjacent to the road or street. The drainage system gets impeded with material like (sedimentary rock which cements together other materials, including gravel, sand, clay, and silt). When flash flooding occurs these areas need to be barricaded, and the location of the storm determines which areas require barricading. Typical road closures due to flooding occur on West College Street at the bridge crossing and streets in the older part of the city.

Hail is an outgrowth of a severe thunderstorm in which balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals

form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The entire geographic planning area, properties, and populations have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds have the potential to affect the entire planning area.

High winds are a frequent occurrence with severe thunderstorms and they can affect all areas of the City of Princeton. These winds can occur suddenly and without warning during severe weather and may pose access challenges due to fallen trees on roadways. Manufactured homes and exposed populations are most vulnerable.

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A “bolt” or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes. Bolts of lightning can reach temperatures approaching 50,000° Fahrenheit. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. Federal Emergency Management Agency states that an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and ignition of wildfires which can result in widespread damages to property. The entire geographic planning area**,** properties, and populations have the potential to be vulnerable to lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado A violently rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel cloud. The entire geographic planning area, properties, and populations have the potential to be vulnerable to tornados. Manufactured homes and exposed populations are most vulnerable.

Wildfire in the City of Princeton is a low to moderate risk due to the well managed and readily available resources for response and 43.54% of the population lives in the WUI; the moderate threat area is location on the eastern side of the city and the low threat areas are located in the western side of the city. The City of Princeton gets mutual aid from surrounding agencies in Collin County that respond to fires within the City of Princeton during times of drought, burn bans, and high fire threat, this is part of the automatic mutual aid between the cities.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard, combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. The entire geographic planning area, properties, and populations have the potential to be vulnerable to winter storms. Winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. The homeless, elderly, and populations without access to heat are most vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of Princeton geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, and the City of Princeton Emergency Management Coordinator.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, City of Princeton Emergency Management Coordinator. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, and the City of Princeton Emergency Management Coordinator.

The following tables provide a breakdown of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to city municipal information of residential water meters and 3.5 persons per households, the estimated total population of City of Princeton in 2020 was 15,330 people, with 7,163 households . The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
City of Princeton	15,330	1.4%	1,444.86	5,397	1.4%	508.75

Source: Local Jurisdiction, US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the City of Princeton.

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
City of Princeton	6,807	10,560	12,680	2,120	20.08%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 7,603 parcels in Princeton, with an estimated $1,003,526,396 in total assessed value of improvements. *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
City of Princeton	7,603	0.82%	$1,003,526,396

Source: Collin County Appraisal District

Emergency Facilities

There are three identified emergency facilities in Princeton, including two fire stations, one police station. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
City of Princeton	2	1	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are 12 critical facilities, which are considered non-emergency in Princeton, including twelve schools and two historical properties. Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
	12	2

Source: Local jurisdictions

Critical Infrastructure

There are 22 identified critical infrastructure facilities, including nine lift stations, three natural gas facilities, two water treatment facilities, zero wastewater treatment facilities, zero dams, and eight railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Lift Stations	Natural Gas and liquid Petroleum Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
City of Princeton	9	3	0	2	0	8

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, Princeton's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 13 hazards evaluated for Princeton, four were analyzed using a Geographic Information System-based analysis, 5 using a statistical risk assessment methodology, and the remaining 4 hazards using qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these 4 hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis

Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Princeton are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the City of Princeton are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the City of Princeton. The City of Princeton and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Princeton is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Princeton are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Princeton.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 1.43% of the population of City of Princeton is located within the 100-year floodplain.
Improved Property	There have been two (2) recorded flood events in the City of Princeton. Property losses are expected but unknown due to inaccurate reporting No crop losses are expected. Approximately $3,240,000 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail

Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Princeton are expected at $228.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for the City of Princeton indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Princeton are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Princeton are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Princeton are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries from high wind events. All the population of the City of Princeton are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Princeton are expected at $4,228.57 per year however these values are underestimated due to lack of accurate reporting. Crop losses expected at $71.43 per year however these values are underestimated due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Princeton are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Princeton are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Princeton are vulnerable to this hazard.

Summary Table 3.16

Lightning

Population	According to National Centers for Environmental Information (NCEI), lightning events can be expected to cause no fatalities or injuries in the City of Princeton. All populations in the City of Princeton are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Princeton are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Princeton are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Princeton are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Princeton are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been 3 recorded injuries and no recorded fatalities from tornado events in the City of Princeton. All the population of the City of Princeton is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), an average loss of $10,000 per year in property losses is expected to result from tornado events. No crop losses resulted from this hazard in the City of Princeton.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Princeton are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Princeton are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Princeton are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 43.54% of the City of Princeton is vulnerable to wildfires, with the City of Princeton and the unincorporated areas contributing with the majority of the exposed population.

Improved Property	Based on geographical data, property losses in the City of Princeton are expected but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the City of Princeton are also unknown...
Emergency Facilities	Based on geographic information there are 0 fire stations and 0 police stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are no schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facilities, and 0 water treatment facilities at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Princeton. All the population of the City of Princeton is exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Princeton are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Princeton.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Princeton are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Princeton are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Princeton are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, Collin County considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes**
Princeton	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	?	**71%**
Average Yes Capabilities – 71%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Princeton	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	**90%**
Average Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Princeton	Y	Y	Y	Y	Y	Y	Y	N	N	?	**70%**
Average Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify Collin County's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, Princeton has 71% of identified legal and regulatory capabilities, 90% of identified administrative and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Princeton	City Manager	The city council, including the mayor, mayor pro-tem, and council members, along with the city manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Princeton Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Princeton Action Items: Deferred from 2016 Plan

City of Princeton Action Item	Adopt and promote a public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Wildfire, Winter Storm, Extreme Heat, High Winds, Flooding, Expansive Soils, Hail, Drought, Earthquake, Lightning, Dam Failure
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Program will include information on hazard mitigation and what actions can be taken.
Status	Utilize as able regional, state, and federal public education information. Will be included in 2021 Plan

City of Princeton Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Fire Department/EMC
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – Will be included in 2021 Plan

City of Princeton Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program.
Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

City of Princeton Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning, Dam Failure
Goal/Objective	1-B
Priority	High
Estimated Cost	$25,000 each
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Cost is low compared to lives saved and reduced injuries
Discussion	Early warning is a key element in keeping citizens that are outdoors notified of hazards.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2A, 3C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	3-4 years
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	2-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage.
Status	Deferred – Will be included in 2021 Plan

City of Princeton Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flooding
Goal/Objective	2A, 3A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Status	Deferred – will be included in 2021 Plan

City of Princeton Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – Will be included in 2021 Plan

City of Princeton Action Items: New

City of Princeton Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	General Fund, HMGP
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC

Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety.
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Princeton Action Item	Develop and implement an extreme temperature program that establishes centers for vulnerable residents
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D, 3-C
Priority	Medium
Estimated Cost	$5,000-$20,000
Potential Funding Sources	HMGP, PDM,
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Fire Department/EMC
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

City of Princeton Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	High Wind, Tornado
Goal/Objective	1-C
Priority	High
Estimated Cost	Up to $3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA

Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program.

City of Princeton Action Item	Increase outdoor warning siren coverage for new development areas.
Hazard(s) Addressed	Tornado, Wildfire, High Winds, Flooding, Hail, Lightning
Goal/Objective	1-B
Priority	High
Estimated Cost	$25,000 each
Potential Funding Sources	General Fund, HMGP, Developer cost
Potential Matching Sources	Local funds, in-kind
Lead Department	EMC
Implementation Schedule	2-5 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Cost is low compared to lives saved and reduced injuries
Discussion	Early warning is a key element in keeping citizens that are outdoors notified of hazards. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Princeton Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	2A, 3C
Priority	Medium
Estimated Cost	$5,000
Potential Funding Sources	TFS Grants,
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Fire Dept.
Implementation Schedule	3-4 years

Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show city officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around new development properties.
Discussion	Identify all structures and infrastructures that would be impacted by a potential wildfire.

City of Princeton Action Item	Develop a drought contingency plan
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local sponsors, in-kind
Lead Department	Public Works
Implementation Schedule	2-3 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Develop a plan for conserving water based on the stages of drought. Plan would include strategies for soil movement abatement depending on drought stage. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Princeton Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds

Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Princeton Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Princeton Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Drought, Earthquake, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party

Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information

City of Princeton Action Item	Increase back-up generator capabilities of critical facilities
Hazard(s) Addressed	Flooding, tornado, earthquake, extreme heat, lightning, wildfire, winter storms, hail, high winds
Goal/Objective	2-d
Priority	High
Estimated Cost	$100,000-$20,000
Potential Funding Sources	Local funding, HMGP, PDM
Potential Matching Sources	Local Funding
Lead Department	Public Works, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Some buildings will need to be retrofitted with the ability to connect to a generator
Effect on New Buildings	Buildings will need to be planned with the ability to connect to a generator
Cost Effectiveness	Very effective when taking into account the extended loss of power to critical facilities would negatively affect all the city and its citizens
Discussion	Back-up generator will allow the ongoing function of critical facilities as close to normal as possible during the event of a massive power outage

National Flood Insurance Program (NFIP) Compliance

Princeton is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

Collin County							
Communities Participating in the National Flood Program							
CID	**Community Name**	**County**	**Initial FHBM Identified**	**Initial FIRM Identified**	**Curr Eff Map Date**	**Reg-Emer Date**	**Tribal**
480757#	PRINCETON, CITY OF	COLLIN COUNTY	7/25/1975	3/16/1988	06/02/09(M)	3/16/1988	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Princeton	Chief Building Official	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the Development Department. Princeton requires new construction to be elevated to or above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood damage prevention order shall result in fines up to $2,000 per violation plus court costs.
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Participate with FEMA in identifying Special Flood Hazard Areas for future FIRM maps	Princeton participates in Risk Assessment, Mapping and Planning Partners (RAMPP) meetings held by FEMA and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
		Future Mitigation Projects	Princeton will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), City of Princeton has developed a plan maintenance process which is described in the following paragraphs.

Following formal adoption by Collin County Commissioners Court, and formal adoption of the plan by City Council by each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Plan would be implemented by the county and participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, City of Princeton will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	What	Time
City Manager	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Princeton	City Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan updates	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency plans	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Princeton Hazard Mitigation Planning Committee considers this

HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex R: Town of Prosper



1. Introduction

This annex was prepared in 2021 as part of an update to the Town of Prosper/County Multi-Jurisdictional Hazard Mitigation Action Plan. This is the second hazard mitigation plan to be submitted to FEMA for the Town of Prosper. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the Town of Prosper. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While Prosper has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Prosper officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. The Town of Prosper's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), the Town of Prosper developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten the Town of Prosper and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Climatic Data Center (NCDC)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface
National Inventory of Dams	Dam information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Town of Prosper Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in June 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. The Town of Prosper acted as the plan development consultant providing hazard mitigation planning services; the efforts of the planning committee were led by the Prosper Emergency Management Coordinator.

The table below provides a list of the primary representatives on the Prosper planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Town of Prosper	Emergency Management Coordinator	Identify vulnerabilities, review plan, prioritize risks
Town of Prosper	Fire Chief	Review plan
Town of Prosper	Assistant Fire Chief	Review plan
Town of Prosper	Police Chief	Review plan
Town of Prosper	Finance Director	Review plan
Town of Prosper	Asst. Police Chief	Review plan
Town of Prosper	Building Official	Review plan
Town of Prosper	Director of Engineering	Identify mitigation strategies/NFIP manager
Town of Prosper	Director of Public Works	Review plan
Town of Prosper	Executive Director of Infrastructure	Identify Action Items and review plan
Citizen 1	CERT Team Member	Review plan
Citizen 2	CERT Team Member	Review plan
Prosper EDC	Director of Economic Development	Review plan
Prosper ISD	Director of Security	Review plan
Homeland Security	Asst. Director	Identify strategies and Review plan

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Prosper ISD	Director of Security	Review of plan
Town of Prosper	Prosper Citizens (2)	Review of plan
Town of Prosper	Director of Economic Development	Review plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization is also committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.

- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by the Town of Prosper and or Collin County and included all jurisdiction's participation:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County HazMAP Committee Meeting – November 15th, 2020
- The Town of Prosper Hazard Mitigation Team Meeting – December 09, 2020
- The Town of Prosper Hazard Team Meeting – January 15th, 2021
- The Town of Prosper HazMAP Discussion/Update – February 15, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Town of Prosper's Facebook page inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the Town of Prosper identified several natural and man-made hazards that could affect the town. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for the Town of Prosper and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for the Town of Prosper, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
			Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%		Minor	Very few injuries, if at all none	0

	Life Impact	Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the Town of Prosper

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	1	1	1	1	1
Drought	2	1	1	1	1.3
Earthquake	1	0	0	3	0.6
Expansive Soils	1	1	1	1	1
Extreme Heat	1	2	0	2	1.2
Flooding	2	1	2	1	1.55
Hail	3	1	2	1	1.85
High Winds	3	1	1	3	1.8
Lightning	3	2	2	3	2.4
Tornado	3	2	2	3	2.4
Wildfire	2	1	1	1	1.3
Winter Storms	2	1	1	1	1.3

The conclusions drawn from the hazard profiling process for the Town of Prosper, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the Town of Prosper.

Table 3.3 Hazard Rankings for the Town of Prosper

High Risk (PRI 2 - 3)	Lightning Tornado
Moderate Risk (PRI 1.01 -1.9)	Extreme Heat High Winds Wildfire Winter Storm Flooding Drought Hail
Low Risk (PRI 0.50 – 1)	Dam Failure Earthquake Expansive Soils
Negligible to No Risk (PRI 0 – 0.49)	

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the Town of Prosper faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam Failure There are three FWRS Dams located within the limits of the Town of Prosper. Due to a lack of data, inundation studies need to be completed to determine the vulnerabilities of the town.

Drought A prolonged drought can have a serious economic impact on a community. Increased demand for water and electricity may result in shortages of resources. Moreover, since 1996, droughts have caused crop damages in neighboring communities and the Town of Prosper amount to well over 2.7 million dollars along with over one million dollars in property damage. Price increases due to shortages and increased demand would impact Prosper's residents.

Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Prosper are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the Town of Prosper and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake Although no active fault lines exist in the North Texas region, there has been 33 tremors recorded in the past 50 years. There is a possibility that the Town of Prosper may experience an earthquake ranging from Modified Mercalli Intensity I to V, equating to 4.8 and under on the Richter Scale. All properties and populations have the potential to be vulnerable to earthquakes. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils Soil capacity will heave and cause potential foundation movement when the ground experiences a moisture fluctuation. This expansive soil vulnerability can lift buildings or settle them into the ground. Increasing our town's irrigation system and improving current culverts will mitigate future expansive soil problems. All properties has the potential to be vulnerable to expansive soils, especially those constructed under older building codes.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable. What constitutes extreme heat can vary based on what the population is accustomed to in their respective climates. Temperatures that hover 10 degrees or more above the average high temperature for a region and last for several weeks are defined as extreme heat by the Centers for Disease Control and Prevention (CDC). Extreme heat is common in Texas. The Town of Prosper has experienced 10 extreme heat events in the past 23 years, resulting in a 100 percent probability of an extreme heat event occurring every year. The most severe extreme temperature event to impact the Town of Prosper occurred in August 2011, when Collin County experienced triple-digit temperatures nearly every day during the month of August. An excessive heat warning was in effect for most of Texas.

After the excessive heat warning ended on the morning of August 6, a heat advisory was in effect for several days during the month. A heat advisory was in effect for all or parts of North Texas for most of the remainder of the month, except for a few days in the middle of the month. The prolonged heat took its toll on North Texans, resulting in 27 heat-related deaths and many more heat-related illnesses. According to a Collin County medical examiner, one person died on August 12 as a result of the heat.

Flooding is the most prevalent and costly disaster in the United States. Floods have the ability to cause devastation to property, people, and agriculture. Floods occur any time and are typically the result of dam failures, heavy rains, or melting of snow. The Town of Prosper has low topography in several areas which is vulnerable to flooding. The area located on and near Dallas Parkway has experienced flash flooding more than once in the past 5 years. With no signage to warn citizens of the potential danger, this increases the town's vulnerability to loss of life, property, and agriculture, as a result of flooding.

Hail Since 1996, 168 incidents involving hail have occurred. This hazard has caused over one billion dollars in damage throughout our two counties and includes agriculture damage as well. The Town of Prosper, its buildings, and citizen's property are vulnerable to hail and extreme hail storms. Property such as automobiles, roofs, siding, and windows are most vulnerable to such events. Extensive power outages may also occur, leading to secondary and possibly tertiary effects. Mitigation efforts can be made to lessen the effect of such a hazard. These efforts include ample warning systems which cover our entire jurisdiction, public education to encourage action and precautionary measures during weather events which could produce hail, and stronger protection measures facilitated by town codes. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds Windstorms can cause power outages, transportation and economic disruptions, and significant property damage and pose a high risk for injuries and loss of life. All critical facilities as well as all public, private, and commercial properties are vulnerable to severe thunderstorms. Risk/vulnerability includes the entire population of the Town of Prosper because there is no way to determine the impact/magnitude of a windstorm, and no way to predict where a storm will occur. People are vulnerable to severe windstorms through power outages, effects on transportation routes, establishment of shelters, roofs blown off structures, etc. Windstorms occur frequently within the Town of Prosper. Manufactured homes and exposed populations are most vulnerable.

Overall, severe thunderstorms and high winds pose one of the greatest threats to the Town of Prosper in terms of property damage, injuries, and loss of life. Severe thunderstorms and high winds are the most frequently occurring natural hazard in the Town of Prosper and have the greatest chance of affecting the Town of Prosper each year. Based on the frequency of this hazard (134 events since 1996) and its ability to negatively affect the Town of Prosper (7 deaths, 15 injuries, and $5.975 million in property damage within our geographical area).

Lightning The Town of Prosper has significant exposure to lightning and thunderstorms. Overall, lightning is the most constant and widespread threat to our citizens. 38 damaging events have occurred since 1996, within our two counties, which has caused over $7.88 million in damages to property. The probability that lightning will occur in the Town of Prosper is extremely high and mitigation actions, such as a lightning detection system, will help mitigate the risk of this hazard. Property without lightning protection and exposed populations are most vulnerable.

Tornado Tornadoes can strike anywhere and cause extensive damage. Since 1996, North Texas has experienced 17 tornado events causing near $6 million in damages, two deaths, and eight injuries. According to NOAA data, the highest recorded magnitude was an EF-3, which occurred 20 miles from the Town of Prosper and caused $1 million in damages. Currently, the Town of Prosper has implemented improved construction standards to strengthen new buildings which will withstand higher winds produced by tornadoes. Other mitigation measures that will help minimize tornado destruction in the Town of Prosper are: Increasing the number of safe rooms via FEMA grants, education programs concerning loose items, and increased capabilities on the town's current warning system. Manufactured homes and exposed populations are most vulnerable.

Wildland Fire Wildfires typically start in woodland or prairie areas. They can occur naturally or exacerbate by human activities. This hazard can be hard to control, and mitigation efforts are needed to prevent wildfires from occurring in the Town of Prosper. Since 1996, Collin and Denton counties have had five events involving wildfires totaling over $100,000 in damages and a loss of life (1). The Town of Prosper and the surrounding counties are currently in a severe drought phase, thus increasing the town's

vulnerability to wildfires. Mitigation efforts which will help prevent or lessen the effect of wildfires in the Town of Prosper need to include education programs, zoning, burning restrictions, property maintenance, and increased capabilities of our local fire department.

According to the Texas A&M Forest Service 38.19% of the Town of Prosper's population live in the Wildfire Urban Interface (WUI). Wildfire low threat areas are predominately to the east and west areas of the city with the majority of the center of the city in the non-burnable area.

Winter Storms Generally, winter storm season in the Town of Prosper is between the months of November to mid-March. Residents who are disrupted more severely by severe winter storms include those without sufficient heating systems, and those impacted by extended power outages due to falling tree limbs or ice. Most residents do not have backup power sources. Since 1996, 27 winter storm events have occurred within 30 miles of the Town of Prosper, which has led to one death and $891,000 in property damage. Mitigation efforts to prevent the effects of this hazard should include establishing a warming center for Prosper residents that experience insufficient heating during winter storms, tree management, burying power lines, and an outreach program (CRW-system) to identify isolated, vulnerable, and functional-needs populations.

Identification of Assets and Vulnerability Assessment

An inventory of the Town of Prosper geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the US Census bureau, the total population of the Town of Prosper in 2020 was 28,380 people, with 7,313 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total**	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Prosper	28,380	1.96%	1,555.07	9,992	2.60%	547.56

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for the Town of Prosper.

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2020 Estimate	Absolute Change 2019-20120	Percent (%) Change 2018-2010
Prosper	9,423	22,650	28,380	2750	10.7%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 13,048 parcels in the Town of Prosper, with an estimated $4,023,541,491 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)
Prosper	13,048	2.68%	$4,023,541,491

Source: Collin County Appraisal District
This also includes properties from Denton County. The % of County only reflects the Collin County portion of Prosper and in relation to only Collin County.

Emergency Facilities

There are six identified emergency facilities in the Town of Prosper, including two fire stations, one police station, and three hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Prosper	2	1	3

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are13 critical facilities, which are considered non-emergency in in the Town of Prosper. The critical facilities include 11 schools and two historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Prosper	11	2

Source: Local jurisdictions

Critical Infrastructure

There are 14 identified critical infrastructure facilities in the Town of Prosper, including six lift stations, one natural gas facility, no water treatment facilities, no potable water treatment facilities, no dams, one railroad, one highway, and four bridges (*Table 3.9*). In addition to the information in the table the Town of Prosper also has one water-pump facility, one elevated storage facility, and two water towers.

Table 3.9 Critical Infrastructure

Jurisdiction	Lift Stations	Natural Gas Facilities	Wastewater Treatment Facilities	Water Pump Facility	Dams	Railway/ Highway/ Bridges
Prosper	6	1	0	1	3	6

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, the Town of Prosper's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis, and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for the Town of Prosper, two were analyzed using a Geographic Information System-based analysis, seven using a statistical risk assessment methodology, and the remaining three hazards using a qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis

Dam Failure			X
Drought		X	
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail		X	
High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected but financially unknown due to lack of accurate. Historical data indicates that crop losses in the Town of Prosper are expected mostly during water shortages, financially unknown due to lack of accurate reporting.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the Town of Prosper. The Town of Prosper and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the Town of Prosper is not vulnerable to this hazard.
Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the Town of Prosper are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the Town of Prosper are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the Town of Prosper.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 152 residential parcels in the Town of Prosper are located within the 100-year floodplain.
Improved Property	Though there have been three (3) recorded flood events in the Town of Prosper, property losses are expected but financially unknown due to lack of accurate reporting. No crop losses are expected or recorded county-wide. Approximately $467,505,513 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be as risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be as risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure have the potential to be as risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.

Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected at $9,428.57 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data indicates that there are no expected crop losses from this event.
Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the Town of Prosper are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the Town of Prosper are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the Town of Prosper are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the Town of Prosper are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected at $700 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the Town of Prosper.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the Town of Prosper are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the Town of Prosper are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the Town of Prosper are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from lightning events. All the population of the Town of Prosper is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected at $7,500 per year however these values are underestimated due to lack of accurate reporting.

Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the Town of Prosper are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the Town of Prosper are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the Town of Prosper are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in Prosper. All the population of the Town of Prosper is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the Town of Prosper.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the Town of Prosper are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the Town of Prosper are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the Town of Prosper are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 38.19% of the Town of Prosper is vulnerable to wildfires, with the Town of Prosper and the unincorporated areas contributing with the majority of the exposed population. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on geographical data, property losses in the Town of Prosper are expected but unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the Town of Prosper are also unknown...
Emergency Facilities	Based on geographic information there are zero fire stations at risk from wildfire events.
Critical Facilities	Based on geographic information there are seven schools at risk from wildfire events.

Critical Infrastructure	Based on geographic information there are four bridges, zero dams, one water facility, two water towers, and one water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the Town of Prosper. All the population of the Town of Prosper are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of Prosper are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the Town of Prosper.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the Town of Prosper are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the Town of Prosper are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the Town of Prosper are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serves as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Town of Prosper considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
Town of Prosper	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	?	N	**64%**
Average % Yes Capabilities – 64%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Town of Prosper	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	**90%**
Average % Yes Capabilities – 90%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Town of Prosper	N	Y	Y	Y	Y	Y	Y	Y	?	N	**70%**
Average % Yes Capabilities – 70%											
Y- Yes N- No ?- Don't Know											

To quantify Prosper's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the Town of Prosper and its jurisdictions have 64% of identified legal and regulatory capabilities, 90% of identified administrative and technical capabilities, and 70% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
The Town of Prosper	Town Manager	The Town council, including the mayor, mayor pro-tem, and council members, along with the town manager, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the town overall. As the governing body, the ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Prosper Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

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Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate Early Warning Systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties from the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards**.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic, and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

Town of Prosper Action Items: Deferred from 2016 Plan

Town of Prosper Action Item	Adopt and promote a public education program to mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Dam Failure, Flooding, High Wind, Lightning, Wildfire, Tornado, Hail, Extreme Heat, Drought, Winter Storms, Earthquakes, Expansive Soils
Goal/Objective	4A, 4B, 4C
Priority	Medium
Estimated Cost	$30,000
Potential Funding Sources	General Fund, EMPG, PDM
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Fire Department
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger, and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger, and less vulnerable to damages
Cost Effectiveness	Extreme cost effectiveness
Discussion	Share perceptions of disaster myths, increases information gathering. Program will include information about mitigation actions for each hazard.

Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021 Plan
Town of Prosper Action Item	Develop, implement, and enforce ordinances to restrict the use of public water resources for non-essential usage, such as washing cars, landscape, and filling swimming pools
Hazard(s) Addressed	Drought
Goal/Objective	2A, 2C, 3C
Priority	Moderate
Estimated Cost	$45,000
Potential Funding Sources	General Fund, EMPG, other grants
Potential Matching Sources	Local donations, in-kind matching
Lead Department	Public Works, OEM
Implementation Schedule	2-5 years
Effect on Old Buildings	May require retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and lawn sprinklers
Cost Effectiveness	High. With millions of dollars potentially lost due to drought, this mitigation technique would have a long-term benefit on local farmers and citizens
Discussion	Additional project to include working with builders to encourage drought –tolerant landscape to reduce water usage with incentives
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Implement individual/public tornado safe rooms and location awareness
Hazard(s) Addressed	Tornado, High Wind
Goal/Objective	1C, 2D, 4A, 4B,
Priority	High
Estimated Cost	Up to $3,000 per residential safe room/$1,000,000 public retrofit
Potential Funding Sources	FEMA, Local grants, PDM
Potential Matching Sources	Local Funding, Donations, Resident Match
Lead Department	Engineering
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential/public structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	High, Residential safe room shelters decrease personal injuries and death during severe weather, tornadoes, or high winds
Discussion	Possible FEMA rebate program

Status	Will be included in 2021, however, come residents were able to obtain funds through the NCTCOG Saferoom Rebate Program

Town of Prosper Action Item	Protect citizens from extreme weather by building covered patios in public parks
Hazard(s) Addressed	Extreme Heat, Hail, High Winds, Lightning
Goal/Objective	2D
Priority	High
Estimated Cost	$50,000
Potential Funding Sources	PDM, General Budget, State and Federal Grants
Potential Matching Sources	Citizen cost-share, Donations
Lead Department	Public Works/Parks
Implementation Schedule	2-3 years
Effect on Old Buildings	Potentially add covered patios to existing small structures
Effect on New Buildings	N/A
Cost Effectiveness	Cost is low compared to loss of life from heat illness and debris injuries
Discussion	Covered patios are an effective means of providing temporary relief from severe weather
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Purchase and Distribute NOAA Radios to Vulnerable Populations
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	3C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMGP, PDM
Potential Matching Sources	Local funds, General Budget, Donations, citizens cost-share
Lead Department	Fire Department, Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger, and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger, and less vulnerable to damages
Cost Effectiveness	moderate

Discussion	Early warning, hazard and mitigation information, and reliable communications have been established to reduce loss of life, injuries, and property damage
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Develop, Implement, and Enforce Private Residential and Commercial Construction Requirements
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	1C, 2C
Priority	Moderate
Estimated Cost	$85,000
Potential Funding Sources	PDM, EMGP
Potential Matching Sources	General budget, In-Kind
Lead Department	Development Services, OEM
Implementation Schedule	6-9 Months
Effect on Old Buildings	New standards could be used to drive retrofitting
Effect on New Buildings	Buildings will be safer and more resilient in face of hazards
Cost Effectiveness	High
Discussion	Develop and adopt building codes to harden private construction based on the hazards identified in this annex such as hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning
Status	Town of Prosper has adopted current building code and will continue to adopt the most current building codes – will continue to be in future plans and updates

Town of Prosper Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2A, 3A
Priority	High
Estimated Cost	$150,000

Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$45,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred will be included in 2021 Plan (50,000)

Town of Prosper Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A

Priority	Low
Estimated Cost	$100,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

Town of Prosper Action Items: New

Town of Prosper Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4A, 4B, 4C
Priority	Medium
Estimated Cost	$30,000
Potential Funding Sources	General Fund, EMPG, PDM
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Fire Department
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger, and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger, and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

Town of Prosper Action Item	Develop, implement, and enforce ordinances to restrict the use of public water resources for non-essential usage, such as washing cars, landscape, and filling swimming pools
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2A, 2C, 3C
Priority	Moderate
Estimated Cost	$45,000
Potential Funding Sources	General Fund, EMPG, other grants
Potential Matching Sources	Local donations, in-kind matching
Lead Department	Public Works, OEM
Implementation Schedule	2-5 years
Effect on Old Buildings	May require retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and lawn sprinklers
Cost Effectiveness	High. With millions of dollars potentially lost due to drought, this mitigation technique would have a long-term benefit on local farmers and citizens
Discussion	Additional project to include working with builders to encourage drought –tolerant landscape to reduce water usage with incentives When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

Town of Prosper Action Item	Implement individual/public tornado safe rooms and location awareness
Hazard(s) Addressed	Tornado, High Wind
Goal/Objective	1C, 2D, 4A, 4B,
Priority	High
Estimated Cost	Up to $3,000 per residential safe room/$1,000,000 public retrofit
Potential Funding Sources	FEMA, Local grants, PDM
Potential Matching Sources	Local Funding, Donations, Resident Match
Lead Department	Engineering
Implementation Schedule	2-5 years
Effect on Old Buildings	Enhance safety of existing residential/public structures through retrofit
Effect on New Buildings	Enhance safety of new residential structures
Cost Effectiveness	High, Residential safe room shelters decrease personal injuries and death during severe weather, tornadoes, or high winds
Discussion	Possible FEMA rebate program

Town of Prosper Action Item	Protect citizens from extreme weather by building covered patios in public parks
Hazard(s) Addressed	Extreme Heat, Hail, High Winds, Lightning
Goal/Objective	2D
Priority	High
Estimated Cost	$50,000
Potential Funding Sources	PDM, General Budget, State and Federal Grants
Potential Matching Sources	Citizen cost-share, Donations
Lead Department	Public Works/Parks
Implementation Schedule	2-3 years
Effect on Old Buildings	Potentially add covered patios to existing small structures
Effect on New Buildings	N/A
Cost Effectiveness	Cost is low compared to loss of life from heat illness and debris injuries
Discussion	Covered patios are an effective means of providing temporary relief from severe weather

Town of Prosper Action Item	Purchase and Distribute NOAA Radios to Vulnerable Populations
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	3C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMGP, PDM
Potential Matching Sources	Local funds, General Budget, Donations, citizens cost-share
Lead Department	Fire Department, Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger, and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger, and less vulnerable to damages
Cost Effectiveness	moderate
Discussion	Early warning, hazard and mitigation information, and reliable communications have been established to reduce loss of life, injuries, and property damage

Town of Prosper Action Item	Develop, Implement, and Enforce Private Residential and Commercial Construction Requirements
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	1C, 2C
Priority	Moderate
Estimated Cost	$25,000
Potential Funding Sources	PDM, EMGP
Potential Matching Sources	General budget, In-Kind
Lead Department	Development Services, OEM
Implementation Schedule	6-9 Months
Effect on Old Buildings	New standards could be used to drive retrofitting
Effect on New Buildings	Buildings will be safer and more resilient in face of hazards
Cost Effectiveness	High
Discussion	Develop and adopt building codes to harden private construction based on the hazards identified in this annex such as hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning

Town of Prosper Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2A, 3A
Priority	High
Estimated Cost	$125,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS
Implementation Schedule	1-2 years

Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

Town of Prosper Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$50,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

Town of Prosper Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2A
Priority	Low
Estimated Cost	$50,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months

Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

Town of Prosper Action Item	Install outdoor warning sirens
Hazard(s) Addressed	Tornado, High Winds
Goal/Objective	1A, 1B
Priority	High
Estimated Cost	$175,000
Potential Funding Sources	EMPG, PDM BRIC, General Funds, Developers,
Potential Matching Sources	General Funds, In-Kind
Lead Department	OEM
Implementation Schedule	6 Months
Effect on Old Buildings	N/A
Effect on New Buildings	N/A
Cost Effectiveness	Moderate
Discussion	To achieve 100% coverage to all residents of our fast growing jurisdiction, 4 new sirens would need to be installed. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

National Flood Insurance Program (NFIP) Compliance

The Town of Prosper is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480141#	PROSPER, TOWN OF	DENTON COUNTY/COLLIN COUNTY	6/21/1974	5/4/1982	4/18/2011	5/4/1982	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in SFHAs of any participating community. Those communities notified as flood-prone which do not apply for participation in the NFIP within 1 year of notification are ineligible for federal or federally-related financial assistance for acquisition, construction, or reconstruction of insurable buildings in the SFHA.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Town of Prosper	Senior Engineer/Director	Completing and maintaining FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	The Engineering Department is responsible for issuing floodplain permits.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with town's flood damage prevention order shall result in fines up to $500 per violation plus court costs.
		Requiring and maintaining FEMA elevation certificates for all new and improved buildings located in floodplains	The Engineering Department is responsible for issuing floodplain permits.	
		Implementing damage reduction measures for existing buildings such as acquisition, relocation, retrofitting, and maintenance of drainage ways and retention basins	Maintenance of drainage ways and retention basins. Installation of retention basins on new construction.	
		Taking action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	Implementing newly developed Storm-water Management Program which includes public education, new development standards, and other programs and policies.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the Town of Prosper has developed a plan maintenance process which is described in the following paragraphs. Town of Prosper, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by Collin County Commissioners Court, and formal adoption of the plan by City/Town Council by each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Plan would be implemented by the county and participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the Town of Prosper will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Emergency Management Team	Monitoring Plan: Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
Planning Team	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising, and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives, and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives, and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Town of Prosper	Town Council	Budget Meetings	As needed	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan updates	Every Five years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	Town Council, Director of Planning	Capital improvement plans	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, Town Council	Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, Town Council	Parks & Recreation Master Plan	Triennially	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Prosper Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Annex S: Town of St. Paul



1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multijurisdictional Hazard Mitigation Action Plan. The Town of St. Paul participated on the Collin County Hazard Mitigation Planning Team (HMPT). This is a new hazard mitigation plan and the first to be submitted to FEMA for the Town of St. Paul. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the Town of St. Paul. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the Town of St. Paul has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped the Town of St. Paul officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and online.

In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Centers for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the Town of St. Paul Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services; the efforts of the planning committee were led by the Town of St. Paul Emergency Management Coordinator. The table below provides a list of the primary representatives on the St. Paul planning committee.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
Town of St. Paul	Mayor	Review of plan
Town of St. Paul	Town Secretary	Review of plan

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.
- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed

plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
NCTCOG	Emergency Preparedness Prog. Asst.	Review of plan
Collin County	Homeland Security Dept. Coordinator	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each jurisdiction also is committed to accomplishing the following activities:

- Appoint members to a coordinating committee to monitor and work toward plan implementation.
- Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
- Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdictions' participation:

- Emailed Plan to St. Paul for updates – August 12, 2020
- Collin County Planning Meeting – November 5, 2020
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 at 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.
- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated. An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the Town of St. Paul identified several natural and man-made hazards that could affect the town. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for St. Paul and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3

25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the Town of St. Paul

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	0	0	0	0	0
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	2	0.85
Flooding	1	1	0	0	0.65
Hail	2	0	2	1	1.2
High Winds	1	0	0	1	0.4
Lightning	1	0	0	0	0.3
Tornado	2	1	1	1	1.3
Wildfire	1	2	0	1	1.1
Winter Storms	2	0	2	3	1.4

The conclusions drawn from the hazard profiling process for Collin County jurisdictions, resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in Collin County.

Table 3.3 Hazard Rankings for the Town of St. Paul

High Risk (PRI 2 - 3)	
Moderate Risk (PRI 1.01 -1.9)	Tornado Winter Storms Drought Wildfire
Low Risk (PRI 0.50 – 1)	Extreme Heat Expansive Soils Hail Flooding
Negligible to No Risk (PRI 0 – 0.49)	Earthquake High Winds Lightning Dam Failure

Changes in Development and Priorities (Requirement §201.6(d) (3))

Our jurisdiction is in one of the fastest growing areas of the nation, hence development has increased and will continue to increase our vulnerability to hazards that may impact us.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the Town of St. Paul faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation.

Dam and Levee Failure A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Because dams are man-made structures, dam failures are usually considered technological hazards. However, since most dam failures result from prolonged periods of rainfall, they are often cited as secondary or cascading effects of natural flooding disasters and are not named as the primary hazard that causes disaster declarations.

Development of the downstream areas necessitates the original low hazard classifications to be changed to higher hazard classifications because the dams are no longer adequate for the increased downstream risks. NRCS data shows that there are no dams in the St. Paul that are no longer adequate for increased downstream risks. This percentage could actually be higher because detailed current evaluations of NRCS dams have not been conducted due to resource limitations. In addition, many of these inadequate dams have not been updated because many of the legally responsible entities of these dams do not have sufficient mechanisms funding for updates, or even adequate maintenance, in some cases. Soil and Water Conservation Districts do not have any statutory funding capability of their own, and counties, especially those with small populations and multiple dams, are not able to generate the resources needed to sustain a consistent and comprehensive effort upgrade these structures. While no record could be found of any previous dam failures in Collin County, three things are clear:

- There are no dams in St. Paul that are nearing the end of their designed project lives

- There are no dams in St. Paul that are in desperate need of detailed evaluations and consistent maintenance
- Increased development downstream of any dams may put more people, property, and infrastructure at risk.

Based on a quantitative analysis of no dams currently being in place in St. Paul and a qualitative analysis of the potential impacts that dam failures would have on the social, economic, and environmental components of the region, the risk of a dam failure hazard is negligible but as a participant in the county plan, inundation studies will be considered.

St. Paul is responsible for no high hazard dams identified by the NRCS in both the unincorporated County area and in several cities due to the use of easements and the Emergency Operations Plans for those dam sites.

Drought Drought has the potential to impact the entire planning area equally; all improved property, critical facilities, critical infrastructure, and the entire population of St. Paul are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the Town of St. Paul and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake An earthquake is a sudden motion or trembling caused by an abrupt release of accumulated strain on the tectonic plates that comprise the Earth's crust. The theory of plate tectonics holds that the Earth's crust is broken into several major plates. These rigid, 50- to 60- mile thick plates move slowly and continuously over the interior of the earth, meeting in some areas and separating in others. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs. The ensuring seismic activity and ground motion provoke secondary hazards: surface faulting, ground failure, and tsunamis. The vibration or shaking of the ground during an earthquake is referred to as ground motion. In general, the severity of ground motion increases with the amount of energy released and decreases with distance from the causative fault or epicenter. When a fault ruptures, seismic waves are propagated in all directions, causing the ground to vibrate at frequencies ranging from 0.1 to 30 Hz. Seismic waves are referred to as P waves, S waves, and surface waves. Earthquakes have the potential to occur anywhere in the geographic planning area, therefore all geographic areas are potentially vulnerable. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils Expansive soils contain minerals such as "smectite" clays that are capable of absorbing water. When they absorb water they increase in volume. The more water they absorb the more their volume increases. Expansions of ten percent or more are not uncommon. This change in volume can exert enough force on a building or other structure to cause damage. Expansive soils will also shrink when they dry out. This shrinkage can remove support from buildings or other structures and result in damaging foundations. Fissures in the soil can also develop. These fissures can facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures. The Town of St. Paul is at low risk from expansive

soils. The entire geographic planning area and properties have the potential to be vulnerable to expansive soils, especially buildings constructed under older building codes.

Extreme Heat Severe summer heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “25-year storm” and “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” most often refers to an area that is subject to inundation by a flood that has a one percent chance of occurring in any given year (commonly and incorrectly referred to as the 100-year floodplain). Common flooding hazards within the planning area include impacts from flash flooding and from new development.

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains, hurricanes, and tropical storms. Flash floods are a high risk hazard since they can roll boulders, tear out trees, and destroy buildings and bridges. There were no trouble areas identified in St. Paul.

Hail Outgrowth of a severe thunderstorm in which balls or irregularly shaped lumps of ice greater than 0.75 inches in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The entire geographic planning area, properties, and populations have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Wind Straight-line winds are often responsible for the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction, and the worst damage is usually on the forward side of the downburst. High winds have the potential to affect the entire planning area. Manufactured homes and exposed populations are most vulnerable.

High winds are a frequent occurrence with severe thunderstorms and they can affect all areas of St. Paul. These winds can occur suddenly and without warning during severe weather and may pose access challenges due to fallen trees on roadways. There have been several instances of damage occurring to business and commercial structures as a result of high winds. Outside of primary residential structures, there are few locations for the public to seek shelter during high winds.

Lightning Lightning damage results from four (4) effects of lightning strike: electrocution of humans and animals; vaporization of materials along the path of strike; fire caused by the high temperature produced by the strike; and a sudden power surge that can damage electrical and electronic utility substations and distribution lines. It is estimated that throughout the United States, a power outage caused by lightning occurs on 50 percent of the days throughout the year. Lightning has the potential to affect all populations and property in the Town of St. Paul. Property without lightning protection and exposed populations are most vulnerable.

Tornado A violently rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a condensation funnel cloud. Tornados may occur anywhere in the geographic planning area, making all properties and populations potentially vulnerable. Manufactured homes and exposed populations are most vulnerable.

Wildland Fire Wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages or benefits. Wildland fires are fueled almost exclusively by natural vegetation. They typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression. Interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide fuel. Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted. For the purposes of this hazard analysis, wildland fires are assessed under what is known as the Wildland Urban Interface (WUI). The WUI is an area of development that is susceptible to wildland fires due to the amount of structures located in an area with vegetation that can act a fuel for a wildland fire.

Wildland fires can occur anywhere in the geographic planning area, but most vulnerable populations and structures are located in the WUI. According to the Texas Forest Service Wildfire Risk Assessment Summary 82.86% of the town's population lives in the Wildland Urban Interface and is at moderate threat to wildfires.

Winter Storms Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard, combines heavy snowfall, high winds, extreme cold and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude and proximity to moderating influences. The entire geographic planning area, properties, and populations have the potential to be vulnerable to winter storms. Winter storms have the potential to make roads impassable for days. Residents may be confined to their homes due to the storm and may be without basic services, such as water and electricity, for an extended period of time. The homeless, elderly, and populations without access to heat are most vulnerable.

Identification of Assets and Vulnerability Assessment

An inventory of the Town of St. Paul geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the 2020 NCTCOG Population Estimates, the total population of Town of St. Paul in 2020 was 1090 people, with 379 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4. Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
St. Paul	1090	0.09%	674.29	332	0.09%	237.42

Source: 2020 NCTCOG Population Estimate & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predications for Town of St. Paul.

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
St. Paul	1,066	1,090	1,090	0	0%

Source: 2020 NCTCOG Population Estimate

Property

There are an estimated 446 parcels in Town of St. Paul, with an estimated $94,227,833in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)[1]
St. Paul	446	0.16%	$94,227,833

Source: Collin County Appraisal District

Emergency Facilities

There are zero identified emergency facilities in the Town of St. Paul, including no fire stations, no police stations, and no hospitals. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
St. Paul	0	0	0

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There is one critical facility, which are considered non-emergency in Town of St. Paul. The critical facility is one historical property site (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
St. Paul	0	1

Source: Local jurisdictions

Critical Infrastructure

There are no identified critical infrastructure facilities in the Town of St. Paul. (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
St. Paul	0	0	0	0	0	0

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, Collin County's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, 5 using a statistical risk assessment methodology, and the remaining 3 using qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these 3 hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. Table 3.10 summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		
High Winds		X	
Lightning		X	X

Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) zero (0) recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but financially unknown due to lack of accurate reporting. Historical data indicates that crop losses in the Town of St. Paul are expected mostly during water shortages, financially unknown due to lack of accurate reporting .
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were no fatalities recorded due to extreme heat from the Town of St. Paul. The Town of St. Paul and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the Town of St. Paul is not vulnerable to this hazard.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the Town of St. Paul are not vulnerable to this hazard.

Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the Town of St. Paul.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 0.99% of the population of the Town of St. Paul is located within the 100-year floodplain.
Improved Property	Though there have been zero (0) recorded flood events in the Town of St. Paul, property losses are expected but financially unknown due to lack of accurate reporting. No crop losses are expected or recorded. Approximately 0.99% of the total assessed value of improvements in the Town of St. Paul is at risk from the 100-year storm event.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	There are no critical facilities located within the 100-year storm event.
Critical Infrastructure	0% of railways/highways and bridges, 0% of dams, 0% of water treatment works, and 0% waste water treatment facilities are at risk from the 100-year storm event. Many of these structures are designed to traverse or be located within the floodplain due to unavoidable circumstances. Additionally, treated wastewater is typically discharged towards streams, which makes portions of wastewater treatment facilities likely to be located within the floodplain.

Summary Table 3.14

Hail	
Population	According to National Centers for Environmental Information (NCEI), no recorded injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but unknown due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data indicates that there are no expected crop losses from this event..
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the Town of St. Paul are vulnerable to this hazard.

Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the Town of St. Paul are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but unknown due to lack of accurate reporting. No crop losses resulted from this hazard in St. Paul.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the Town of St. Paul are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the Town of St. Paul are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from lightning events. All the population of the Town of St. Paul is vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but unknown due to lack of accurate reporting
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the Town of St. Paul are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the Town of St. Paul are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the Town of St Paul. All the population of St. Paul is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but unknown due to lack of accurate reporting. No crop losses are expected from this hazard in the Town of St. Paul.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the Town of St. Paul are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the Town of St. Paul are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 82.86% of the Town of St. Paul is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, percentage of the overall property improvement values across the Town of St. Paul are also unknown.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Based on geographic information there are 0 schools at risk from wildfire events.
Critical Infrastructure	Based on geographic information there are 0 bridges, 0 dams, 0 wastewater treatment facility, and 0 water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the Town of St. Paul. All the population of the Town of St. Paul are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the Town of St. Paul are expected but unknown due to lack of reporting however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the Town of St. Paul.
Emergency Facilities	There are no emergency facilities located within the Town of St. Paul. Therefore, no facilities are at risk.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the Town of St. Paul are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the Town of St. Paul are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Town of St. Paul considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	**Building Code**	**Zoning Ordinance**	**Subdivision Ordinance or regulation**	**Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)**	**Growth management ordinances (also called "smart Growth" or anti-sprawl programs)**	**Site Plan review requirements**	**General or comprehensive plan**	**A capital improvements plan**	**An economic development plan**	**An emergency response plan**	**A post-disaster recovery plan**	**A post-disaster recovery ordinance**	**Real estate disclosure requirements**	**Other**	**% Yes per Jurisdiction**
Town of St. Paul	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	N	N	?	**57%**
Average % Yes Capabilities – 62%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes
Town of St. Paul	Y	Y	Y	N	Y	N	Y	N	Y	N	**60%**
Average % Yes Capabilities – 60%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes
Town of St. Paul	N	Y	Y	N	N	Y	Y	Y	N	?	**50%**
Average % Yes Capabilities – 50%											
Y- Yes N- No ?- Don't Know											

To quantify the Town of St. Paul's legal and regulatory capabilities, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-100%). Questionnaire responses indicated that on average, the Town of St. Paul has 57.14% of identified legal and regulatory capabilities, 60% of identified administrative and technical capabilities, and 50% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
Town of St. Paul	Town Secretary	The town council, including the mayor, mayor pro-tem, and council members, along with the town secretary, address the budget; pass laws, regulations, and codes; hire staff; approve plans; and determine the direction of the town overall. Ability to implement and approve mitigation actions and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Town of St. Paul Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 **Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.**

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate early warning systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornados through the construction and use of safe rooms or shelter areas.

Goal 2 **Protect existing and new properties for the effects of all natural hazards.**

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 **Reduce losses and repetitive damages from chronic hazard events.**

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 **Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.**

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis, economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

Town of St. Paul Action Items: Deferred from 2016 Plan

Town of St. Paul Action Item	Adopt and promote public education program.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	4A, 4B, 4-C
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Public education is extremely effective for low cost.
Discussion	Also the utilization of social media will be key in this program. Program will include information about mitigation actions and education.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

Town of St. Paul Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-C
Priority	High
Estimated Cost	$3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	Town Administration
Implementation Schedule	2-3 years
Effect on Old Buildings	Some buildings modified for safe room retrofit
Effect on New Buildings	Buildings constructed with safe rooms
Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program
Status	Deferred – Residents did received funding through the NCTCOG Saferoom Rebate Program. The NCTCOG Program has been suspended

Town of St. Paul Action Item	Purchase of a CASA (WX) Weather Radar system
Hazard(s) Addressed	Hail, Tornadoes, Wildfire, Flooding, Lightning, Dam Failure
Goal/Objective	1-A, 3-C
Priority	High
Estimated Cost	$550,000
Potential Funding Sources	Local Funding, Federal Funding, HMPG
Potential Matching Sources	Local Grants
Lead Department	Town Administration
Implementation Schedule	12-36 Months
Effect on Old Buildings	n/a
Effect on New Buildings	Increase response decisions by 100%
Cost Effectiveness	Cost effectiveness is low compared to the benefits.
Discussion	The Collaborative Adaptive Sensing of the Atmosphere (CASA WX) project is a multi-sector partnership dedicated to engineering revolutionary weather-sensing networks. The main purpose of the CASA WX project is to save lives and minimize injuries due to severe weather. This is accomplished through the enhancement of data by providing lower atmospheric coverage at faster rates. The CASA WX radars provide jurisdictions more accurate weather data and geographically specific weather data culled from the most active levels of the atmosphere. This data

	could save lives by providing the public more time to react and prepare appropriately as severe weather affects their location. The more accurate data will also provide a better means to analyze severe weather post event which can also help in the assessment of damage after a severe weather event.
Status	No longer viable project for St. Paul

Town of St. Paul Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Populations, Businesses, and Critical Infrastructure.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Expansive Soils, Earthquake, Dam Failure, Flooding
Goal/Objective	3-C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Town Administration
Implementation Schedule	12-18 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning saves lives, which outweighs the cost of the radios.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens about severe weather, civil emergencies and hazard information. It is impossible to quantify the value of a human life or value of an injury.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$65,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind, grants
Lead Department	Town Administration
Implementation Schedule	18-36 Months

Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire
Cost Effectiveness	CWPPs show county officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around lake development properties.
Discussion	This project will become increasingly needed as development around Richland Chambers (Tarrant County Water Supply) increases.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams within the county.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	2-A, 3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Town Administration
Implementation Schedule	12-18 Months
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000-$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration

Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop, implement, and enforce building codes that would prevent building deterioration from structure-impacting hazards.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Dam Failure, Earthquake, Expansive Soils, Flooding
Goal/Objective	2-C, 3-C
Priority	Low
Estimated Cost	$5,000- $7,500
Potential Funding Sources	General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration
Implementation Schedule	12 Months
Effect on Old Buildings	New building codes would allow for existing buildings to be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	New building codes would allow for new buildings to be constructed to mitigate against structure-impacting
Cost Effectiveness	Low - Benefits outweigh costs
Discussion	Building codes would help to promote better building standards such as including hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought
Goal/Objective	4-C
Priority	Medium
Estimated Cost	$1,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with local water supplies to implement mandatory water restrictions
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement storm water management on creek waterways
Hazard(s) Addressed	Flooding
Goal/Objective	2-D, 2-E, 3-C
Priority	Medium
Estimated Cost	$75,000
Potential Funding Sources	HMGP, General Funds
Potential Matching Sources	Local funds, In-kind match
Lead Department	Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	My prevent flooding of existing structures
Effect on New Buildings	May prevent flooding of planned development areas
Cost Effectiveness	Low compared to life safety benefits
Discussion	Project would prevent erosion, stopping expansion of the floodplain
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Develop and implement debris management program targeting stream banks at bridges
Hazard(s) Addressed	Flooding

Goal/Objective	2-E, 3-C
Priority	Medium
Estimated Cost	$534,000
Potential Funding Sources	HMGP, General Funds
Potential Matching Sources	Local funds, In-kind match
Lead Department	Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	Could prevent flooding and disruption to transportation
Effect on New Buildings	None
Cost Effectiveness	Low compared to life safety benefits
Discussion	Town of St. Paul needs to ensure clear waterways in order to prevent buildup of debris and materials that could cause flooding and contribute to damage to bridges.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works
Implementation Schedule	6 months – 18 months
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	. Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Water Shed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low

Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.
Status	Deferred – will be included in 2021 Plan

Town of St. Paul Items: New

Town of St. Paul Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4A, 4B, 4-C
Priority	Medium
Estimated Cost	$15,000
Potential Funding Sources	General fund, HMGP, PDM, other state/federal grants
Potential Matching Sources	Local funds, citizen cost-share, donations
Lead Department	Department of Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation..

Town of St. Paul Action Item	Implement Individual Tornado Safe Room Rebate Program
Hazard(s) Addressed	Tornadoes
Goal/Objective	1-C
Priority	High
Estimated Cost	$3,000 per safe room
Potential Funding Sources	HMGP, PDM, Resident Match
Potential Matching Sources	Local Grants, FEMA
Lead Department	Department of Town Administration
Implementation Schedule	2-3 years
Effect on Old Buildings	Some buildings modified for safe room retrofit
Effect on New Buildings	Buildings constructed with safe rooms

Cost Effectiveness	Residential safe room shelters potentially decrease personal injuries and death during severe weather, tornadoes or high wind events.
Discussion	Implement Individual Tornado Safe Room Rebate Program

Town of St. Paul Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Populations, Businesses, and Critical Infrastructure.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Expansive Soils, Earthquake, Flooding
Goal/Objective	3-C
Priority	High
Estimated Cost	$60,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Department of Town Administration
Implementation Schedule	12-18 months
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning saves lives, which outweighs the cost of the radios.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens about severe weather, civil emergencies and hazard information. It is impossible to quantify the value of a human life or value of an injury.

Town of St. Paul Action Item	Develop a Community Wildfire Protection Plan (CWPP)
Hazard(s) Addressed	Wildfire
Goal/Objective	1-A, 3-C
Priority	Medium
Estimated Cost	$65,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind, grants
Lead Department	Department of Town Administration
Implementation Schedule	18-36 Months
Effect on Old Buildings	Reduce vulnerability of existing structures to damages or loss from wildfire
Effect on New Buildings	Reduce vulnerability of new structures to damages or loss from wildfire

Cost Effectiveness	CWPPs show county officials where to redouble their efforts in preventing wildfire, saving time and money. Also work to establish urban wildfire interface around lake development properties.
Discussion	This project will become increasingly needed as development around Richland Chambers (Tarrant County Water Supply) increases.

Town of St. Paul Action Item	Develop and implement an extreme temperature program that identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	3-C
Priority	Medium
Estimated Cost	$5,000-$10,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Department of Town Administration
Implementation Schedule	12 months
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold

Town of St. Paul Action Item	Develop, implement, and enforce building codes that would prevent building deterioration from structure-impacting hazards.
Hazard(s) Addressed	Hail, Lightning, Drought, Extreme Heat, High Winds, Tornado, Wildfire, Winter Storm, Earthquake, Expansive Soils, Flooding
Goal/Objective	2-C, 3-C
Priority	Low
Estimated Cost	$5,000- $7,500
Potential Funding Sources	General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Department of Town Administration
Implementation Schedule	12 Months
Effect on Old Buildings	New building codes would allow for existing buildings to be retrofitted to mitigate against structure-impacting hazards.
Effect on New Buildings	New building codes would allow for new buildings to be constructed to mitigate against structure-impacting

Cost Effectiveness	Low - Benefits outweigh costs
Discussion	Building codes would help to promote better building standards such as including hail-resistant roofing and windows; wind and impact resistant doors, windows, and roofing ; wildfire breaks and fire resistant building materials; stricter foundation standards for earthquake and expansive soils; increased elevation (BFE) standards for flooding; higher grade insulation to mitigate extreme heat and winter weather; and resource-efficient (low-flow) plumbing for drought. Also, additional codes for dry-proofing and lightning protection (rods, grounding) for public buildings to mitigate flood, dam failure and lightning.

Town of St. Paul Action Item	Develop and implement mandatory water conservation measures
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	4-C
Priority	Medium
Estimated Cost	$1,000
Potential Funding Sources	HMGP, PDM, General Fund
Potential Matching Sources	Local funds, donations, in-kind
Lead Department	Department of Town Administration
Implementation Schedule	1-2 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Low cost for effective means of preserving water.
Discussion	Promote water conservation throughout the county and work with local water supplies to implement mandatory water restrictions. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

Town of St. Paul Action Item	Develop and implement storm water management on creek waterways
Hazard(s) Addressed	Flooding
Goal/Objective	2-D, 2-E, 3-C
Priority	Medium
Estimated Cost	$75,000
Potential Funding Sources	HMGP, General Funds

Potential Matching Sources	Local funds, In-kind match
Lead Department	Department of Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	My prevent flooding of existing structures
Effect on New Buildings	May prevent flooding of planned development areas
Cost Effectiveness	Low compared to life safety benefits
Discussion	Project would prevent erosion, stopping expansion of the floodplain

Town of St. Paul Action Item	Develop and implement debris management program targeting stream banks at bridges
Hazard(s) Addressed	Flooding
Goal/Objective	2-E, 3-C
Priority	Medium
Estimated Cost	$534,000
Potential Funding Sources	HMGP, General Funds
Potential Matching Sources	Local funds, In-kind match
Lead Department	Department of Town Administration
Implementation Schedule	6 months
Effect on Old Buildings	Could prevent flooding and disruption to transportation
Effect on New Buildings	None
Cost Effectiveness	Low compared to life safety benefits
Discussion	Town of St. Paul needs to ensure clear waterways in order to prevent buildup of debris and materials that could cause flooding and contribute to damage to bridges.

Town of St. Paul Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Department of Town Administration
Implementation Schedule	6 months – 18 months

Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	. Project outputs will guide development of future earthquake mitigation projects.

Town of St. Paul Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Department of Town Administration
Implementation Schedule	12-18 months
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

National Flood Insurance Program (NFIP) Compliance

St. Paul is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
481318#	ST. PAUL, TOWN OF	COLLIN COUNTY	6/6/1978	4/2/1991	06/02/09(M)	8/12/2002	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Compliance

Once the community applies for the NFIP, FEMA arranges for a study of the community to determine base flood elevations and flood risk zones. Consultation with the community occurs at the start of and during the study, and those communities with minimal flood risk are converted to the Regular Program without a study.

FEMA provides the studied community with a Flood Insurance Rate Map delineating base flood elevations and flood risk zones. The community is then given 6 months to adopt base flood elevations in its local zoning and building code ordinances. Once the community adopts more stringent ordinances, FEMA converts the community to the NFIP's Regular Program. FEMA then authorizes the sale of additional flood insurance in the community up to the Regular Program limits. The community must implement and enforce the adopted floodplain management measures. FEMA provides periodic community assistance visits with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
Town of St. Paul	Mayor	Taking action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	No current areas of repetitive flooding. Floodplain Administrator will continue to monitor for any new flooding areas.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with town's flood damage prevention order shall result in fines up to $2000 per violation plus court costs.
		Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the Town of St. Paul. Collin County requires 2 feet of freeboard above the base flood elevation for the top of bottom floor on residential structures and non-residential structures that will be built on properties created or platted after the effective date of the Flood Damage Prevention Order	
		Future Mitigation Projects	The Town of St. Paul will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), the Town of St. Paul has developed a plan maintenance process which is described in the following paragraphs. The Town of St. Paul , along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by Collin County Commissioners Court, and formal adoption of the plan by City/Town Council by each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Plan would be implemented by the county and participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, the Town of St. Paul will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Town Secretary	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

Based on the requirements set forth in § *201.6(c)(4(ii)*, the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for each jurisdiction was carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees will establish a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into the existing regional and local planning strategies.

Local and regional planning committees currently use comprehensive land use planning, capital improvements planning, and building code ordinances to guide development. The mitigation strategy, goals, objectives and actions outlined in this plan will be integrated into these existing mechanisms as applicable. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdiction	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
Town of St. Paul	Mayor, Town Council	Budget Meetings	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
		Emergency Action Plan updates	Every Five Years	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
		Floodplain ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
		Capital improvement plans	As Needed	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
		Drought Contingency plans	As needed	Integrate drought actions such as xeriscaping, water restrictions, and public education
		Natural Resource Conservation Plan	As Needed	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the St. Paul Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicles to ensure implementation of local hazard mitigation actions.

Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

The process described here is the same as was used since the last planning update.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committee will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participants.

Annex T: City of Wylie



1. Introduction

This annex was prepared in 2020 as part of an update to the Collin County Multi-Jurisdictional Hazard Mitigation Action Plan. This plan updates the Wylie hazard mitigation plan submitted to FEMA as part of the 2016 Collin County plan. The City of Wylie participated in the Collin County Hazard Mitigation Planning Team (HMPT) for this update. In addition to the countywide hazards and strategies discussed in the main plan, this annex serves as a complete hazard mitigation planning tool for the City of Wylie. It contains capability assessment information, a specific vulnerability assessment, and a complete mitigation strategy. The methodology and process for developing this annex are explained throughout the following sections.

2. Plan Development and Adoption Process

In order to apply for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with Part 201.3 of the Disaster Mitigation Act of 2000 implemented in the Federal Code of Regulations 44 CRF Part 201.6. While the City of Wylie has historically implemented measures to reduce their vulnerability to hazards, passage of DMA 2000 helped Wylie officials to recognize the benefits of a long-term approach to hazard mitigation, which achieves a gradual decrease of impacts associated through the implementation of a Hazard Mitigation Plan. Collin County's Hazard Mitigation Action Plan represents the collective efforts of all participating jurisdictions, the general public, and stakeholders.

Organizing the Planning Effort

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places, including online. .In accordance with Part 201.6(c)(5) of the Disaster Mitigation Act of 2000 (DMA 2000), Collin County developed this Hazard Mitigation Action Plan. This plan identifies hazards and mechanisms to minimize future damages associated with these hazards, which threaten Collin County and its jurisdictions.

Existing Data and Plans

Existing hazard mitigation information and other plans were reviewed during the development of the Hazard Mitigation Action Plan. GIS, statistical and qualitative data was gathered through numerous sources. The table below outlines the sources of data for the plan:

Table 2.1 Plan Source Data

Source	Data
City and County Appraisal Data 2020	Population and demographics
Regional Hazard Assessment Tool	Hazard occurrences
National Center for Environmental Information (NCEI)	Hazard occurrences
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire Threat and Wildland/Urban Interface
National Inventory of Dams	Dam Information

Planning Committee

This Hazard Mitigation Action Plan was developed by the City of Wylie Hazard Mitigation Planning Committee, with support of the North Central Texas Council of Governments and in conjunction with the Collin County HMPT.

The Collin County HMPT was assembled in November 2020 with representatives from participating jurisdiction planning committees, including mayors, police chiefs, fire chiefs, and the general public. Collin County acted as the plan development consultant providing hazard mitigation planning services; the efforts of the Wylie planning committee were led by the City of Wylie Emergency Management Coordinator.

Table 2.2 Hazard Mitigation Committee – Primary Representatives

Representing	Position	Role
City of Wylie	Emergency Management Coordinator	Information Collection
City of Wylie	City Engineer Building/Planning	Floodplain Manager Information Collection
Collin County	Emergency Management Coordinator	General Assistance

Collin County served as the coordinator and lead agency for all jurisdictions by accomplishing the following activities through the planning process:

- Assigned the County's Assistant Emergency Management Coordinator to provide technical assistance and necessary data to the planning committee.
- Scheduled, coordinated, and facilitated community meetings with the assistance of the HMPT and the planning committees.
- Provided any necessary materials, handouts, etc. for public planning meetings.
- Worked with the HMPT and planning committees to collect and analyze data and develop goals and implementation strategies.
- Prepared, based on community input and planning team/committee direction, the first draft of the plan, and provided technical writing assistance for review, editing and formatting.
- Coordinated with the stakeholders within the jurisdictions and the unincorporated areas of Collin County during plan development.

Each of the individual jurisdictions participated in accomplishing similar activities associated with development of the plan as follows:

- Coordinated input from representatives of neighborhood stakeholder groups and provided a representative to the County HMPT.
- Attended regular meetings of the planning team as coordinated by Collin County.
- Assisted Collin County staff with identifying hazards and estimating potential losses from future hazard events.
- Assisted Collin County in developing and prioritizing mitigation actions to address the identified risks.
- Assisted Collin County in coordinating public meetings to develop the plan.
- Identified the community resources available to support the planning effort.

- Worked for the support of neighborhood stakeholders for the recommendations resulting from the planning process.
- Submitted the proposed plan to all appropriate departments for review and comment and worked with Collin County to incorporate the resulting comments into the proposed plan.

External stakeholders involved in reviewing the Collin County Hazard Mitigation Action Plan:

Table 2.3 External Stakeholders

Representing	Position	Role
Lakepointe Hospital	Representative	Review of plan
Wylie ISD	Representative	Review of plan
First Baptist Church Wylie	Representative	Review of plan

Subsequent to the State of Texas and FEMA approval of the plan, each organization also is committed to accomplishing the following activities:

1. Appoint members to a coordinating committee to monitor and work toward plan implementation.
2. Publicize the plan to neighborhood interests and ensure that new community members are aware of the plan and its contents.
3. Monitor progress in achieving the plan's goals through regular maintenance and implementation projects.

Planning Meetings

During the planning process, the HMPT met to obtain relevant information from the participating jurisdictions and to discuss the objectives and progress of the plan. The objectives of these meetings were to gather information and to provide guidance for each jurisdiction throughout the planning stages.

The following meetings were held by Collin County and included all jurisdiction's participation:

- Collin County HazMAP Kickoff Meeting – August 12, 2020
- Collin County Planning Meeting – November 11, 2020
- Collin County Planning Meeting – June 12, 2021
- Collin County HazMAP Public Meeting – 11/2/2021 at 2PM
- Collin County HazMAP Public Meeting – 01/12/2022 a 9AM

Public Involvement

Support from the community is vital for any successful hazard mitigation plan. The HMPT and planning committee provided opportunities, announced through public communication means, for public participation and input throughout the planning process prior to this draft and before approval of the finalized plan. Advertisement and sign in sheets for these meetings are located in Appendix A.

- The first public meeting was held on November 2, 2021 at 2PM, and advertised on the Collin County website along with other jurisdictional websites inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to comment. The meeting was held virtually via WebEX.

- A second public meeting was held on January 12, 2022 at 9AM. Announcements were placed on jurisdictions websites, including Collin County inviting the public, neighboring communities, local business, academia, agencies, and nonprofits to view and comment on the HazMAP prior to plan submission.

There were no comments directly related to the mitigation plan received from citizens, non-profits, businesses, academia, or interested parties; therefore, no feedback was incorporated.
An additional opportunity for the public to comment on the plan will be held prior to formal plan adoption.

This provided all citizens, stakeholders, neighboring communities, agencies, businesses, academia, non-profit organizations, and all interested parties an opportunity to be involved in the planning process and to take part in the decisions making process that affect the future of the communities that they live in.

3. Jurisdictional Hazard Identification and Risk Assessment

The Hazard Mitigation Planning Committee for the City of Wylie identified several natural and man-made hazards that could affect the city. The committee decided to focus on the natural hazards identified in Section 5 of this update. This was done after reviewing the 2016 HazMAP, the State of Texas Hazard Mitigation Plan, as well as other sources such as federal and state agencies. The hazards were ranked using the Priority Risk Index.

Priority Risk Index

A Priority Risk Index (PRI) was developed with the purpose of categorizing potential hazards for Collin County and ranks each hazard as high, moderate, low, or negligible to no risk. The hazard classification generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Collin County jurisdictions to consider as part of their proposed mitigation strategy.

The PRI is used to assist all jurisdictions participating in the Collin County HazMAP in determining which hazards pose the most significant threat based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective and systematic planning tool for classifying and prioritizing hazard risks in Collin County based on standardized criteria. The PRI results in numerical values that allow identified hazards to be ranked against one another. The sum of all four categories equals the final PRI value, as shown below:

PRI Value = (Probability x .30) + (Life Impact x .35) + (Property Impact x .25) + (Spatial Extent x .10)

The higher the PRI value, the greater the hazards risk. These values were obtained by assigning varying degrees of risk to four categories for each hazard: Probability, Life Impact, Property Impact, and Spatial Extent *(Table 3.1).* Each category has been assigned an Index Value (0 to 3) and a Weighing Factor (0 – 100%). These values may be adjusted during future plan updates. In order to evaluate the risk of each hazard, the assigned PRI Value for each category is multiplied by the weighing factor. Then, the PRI for each hazard is calculated by adding the product obtained in each category. According to the weighing scheme applied for Collin County, the highest possible PRI value is 3.0. The PRI calculations are presented in *Table 3.2*. Table 3.1 breaks down the value of each category.

Table 3.1 Priority Risk Index Value

Assigned Weighing Factor	PRI Category	Degree of Risk		
		Level	Criteria	Index Value
30%	Probability	Unlikely	Less than 1% annual probability	0
		Possible	Between 1 and 10% annual probability	1
		Likely	Between 10 and 100% annual probability	2
		Highly Likely	100% annual probability	3
35%	Life Impact	Minor	Very few injuries, if at all none	0
		Limited	Minor Injuries	1
		Critical	Multiple deaths/injuries	2
		Catastrophic	High number of deaths/injuries	3
25%	Property Impact	Minor	Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities.	0
		Limited	More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day.	1
		Critical	More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week.	2
		Catastrophic	More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more.	3
10%	Spatial Extent	Negligible	Less than 1% of area affected	0
		Small	Between 1 and 10% of area affected	1
		Moderate	Between 10 and 50% of area affected	2
		Large	Between 50 and 100% of area affected	3

Table 3.2 Priority Risk Index for the City of Wylie

Hazard	Category/Degree of Risk				
	Probability Index Value (0 - 3 30%)	Life Impact Index Value (0 - 3 35%)	Property Impact Index Value (0 - 3 25%)	Spatial Extent Index Value (0 - 3 10%)	PRI Value 2021
Dam Failure	1	0	0	0	0.3
Drought	2	0	1	3	1.15
Earthquake	0	1	0	1	0.45
Expansive Soils	2	0	0	1	0.7
Extreme Heat	1	1	0	3	0.95
Flooding	1	1	0	1	0.75
Hail	2	0	1	2	1.05
High Winds	1	0	0	1	0.4
Lightning	2	1	0	0	0.95
Tornado	2	2	2	2	2
Wildfire	1	0	0	0	0.3
Winter Storms	2	0	1	3	1.15

The conclusions drawn from the hazard profiling process for the city of Wylie resulted in the classification of risk for each identified hazard according to four categories: High Risk, Moderate Risk, Low Risk, and Negligible to No Risk *(Table 3.3).* For purposes of these classifications, risk is expressed in relative terms according to the probability of occurrence and estimated impact that a hazard will have on human life and property in the city of Wylie.

Table 3.3 Hazard Rankings City of Wylie

High Risk (PRI 2 - 3)	Tornado
Moderate Risk (PRI 1.01 -1.9)	Hail Winter Storms
Low Risk (PRI 0.50 – 1)	Drought Lightning Expansive Soils Extreme Heat Flooding
Negligible to No Risk (PRI 0 – 0.49)	Earthquake Dam Failure Wildfire High Winds

Changes in Development and Priorities (Requirement §201.6(d)(3))

The City of Wylie was a participating jurisdiction in the 2016 Collin County Hazard Mitigation Action Plan. Since then, Wylie has completed several of their original action items, in an effort to lower vulnerability on populations and property from natural hazards. The following actions, sorted by type of action, have had a direct impact on lowering vulnerability:

- Natural Systems Protection
- Local Rules and Regulations
  - Maintained continued NFIP compliance through continued enforcement and compliance with city ordinance.
  - Expanded early warning sirens and local warning system to notify the public of impending severe weather to reduce the loss of life and mitigate the effects of the hazards.

The City of Wylie is continuously working to increase their outdoor warning system to accommodate expanding areas. The development and implementation of these projects have directly led to lower vulnerability for residents and property located in Wylie. A NexGEN software upgrade has been completed and two new outdoor warning sirens are scheduled for installation by fall of 2021 with more to follow along with siren upgrades.

As of January 1, 2015 the official population was 45,000 and the current population is 56,376. Housing units have increased from approximately 14,971 to 19,113. Enrollment in Wylie IDS rose from 14,426 in 2015 to approximately 18,300 for the 2021 school year.

The City of Wylie has new developments that include Collin College, an apartment complex, Holiday Inn Express, La Quinta, Whataburger, Chik-Fil-A, new subdivisions, expansions of existing subdivisions, various retail and an assisted living facility.

Planned development for the City of Wylie includes Wylie Fire Rescue Station #4, an expansion of the KCS yard, an apartment complex, and various retail.

New priorities are noted and ranked in each new action item, Section 6. Except for actions completed or cancelled, other priorities remain the same as in the previous version of this plan.

Vulnerability Narratives

This annex focuses on specific areas of vulnerability the City of Wylie faces with each hazard. The hazards identified in the main plan are all addressed in this annex, therefore the natural hazards rated negligible to no risk are included, described, and considered for mitigation in this plan.

Dam and Levee Failure The City of Wylie borders along the southern and western area of Lake Lavon including just west of the Lake Lavon Dam. Lake Lavon is owned and managed by the Army Corps of Engineers. In the event of a worst case scenario dam failure the inundation zone does not affect the City of Wylie. This was tested in a joint exercise with the Army Corps of Engineers. The land south of Lake Lavon Dam is the spillway then it leads to the next lake which is Lake Ray Hubbard. Therefore the City of Wylie is not considered to be at risk for dam failure although unincorporated areas served by Wylie Fire Rescue may be, so inundation studies will be considered. Muddy Creek Dam is owned by the City of Wylie and is located west of Country Club Road across from the Municipal Complex. Any breach of this dam would flow southeast towards FM 544 and may have an effect on businesses and some residences depending on capacity. This inundation would possibly have an effect on the neighboring jurisdictions of

Sachse and Rowlett. This would be a low risk as it would not affect a high population but could still cause damage for some businesses/residents.

Drought Drought has the potential to impact the entire planning area equally; all improved property, emergency facilities, critical facilities, critical infrastructure, and the entire population of Wylie are vulnerable to this hazard. Foundations of all buildings are vulnerable; however, older structures, or those built under less stringent foundation code requirements are most vulnerable. Lake Lavon, Lake Texoma, Lake Tawakoni, Lake Fork and the Lake Chapman-Cooper reservoir system are water sources for the City of Wylie and are vulnerable to drought. In turn, the city's population, wildlife and vegetation are vulnerable. Lower income populations who may not have the resources to buy containerized water in the event of a shortage may be more vulnerable than other populations.

Earthquake All properties and populations have the potential to be vulnerable to earthquakes. Buildings constructed under older building codes, aging underground infrastructure, and roads are most vulnerable to damages from seismic activity.

Expansive Soils All properties have the potential to be vulnerable to expansive soils, especially those constructed under older building codes.

Extreme Heat Extreme heat generally affects the entire population, but the homeless, very young, elderly, and populations without air conditioning are most vulnerable.

Flooding This hazard was identified as having low risk to the City of Wylie. Areas that are prone to flash flooding are: the S curve on McMillan Rd off of Country Club and Sachse Rd at Creek Crossing on the border of Wylie and Sachse.

Hail Hail storms are common during the severe weather months within "tornado alley." It is common for roofs of houses and vehicles to suffer damage from the occasional hail storm. All properties and populations have the potential to be vulnerable to hail. Exposed populations, manufactured homes, and older properties are most vulnerable.

High Winds High Winds are common during the severe weather months within "tornado alley". It is common for fences and trees to suffer damage from the occasional high wind storm. All properties and populations have the potential to be vulnerable to high winds, manufactured homes and exposed populations are most vulnerable.

Lightning All properties and populations have the potential to be vulnerable to lightning. Property without lightning protection and exposed populations are most vulnerable.

Tornado The City of Wylie is within "tornado alley", therefore, there is the potential for a tornado to occur. All properties and populations have the potential to be vulnerable to tornadoes, manufactured homes and exposed populations are most vulnerable.

Wildland Fire This hazard was identified as having minimal or low risk to the City of Wylie. According to data by the Texas Forest Service, it is estimated that 38.07% percent of Wylie's population lives within the WUI which is located primarily in the southern part of the city.

Winter Storms .Texas is greatly affected by winter storms because this is not a common occurrence as in some states. Heavy ice and snow can cause loss of power for an extended amount of time as well as transportation issues which impact life safety. Freezing temperatures and blowing winds can also contribute to life safety issues as well as property damage. Vulnerable populations include the homeless, elderly, and those without access to heat. Critical facilities are also at risk.

Identification of Assets and Vulnerability Assessment

An inventory of Wylie's geo-referenced assets was created in order to identify and characterize property and population potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. For this assessment, five categories of assets were evaluated using Geographic Information System and statistical analysis. The five categories of vulnerable assets include:

- **Population**: Includes the number of people residing in Collin County jurisdictions as delineated by U.S. Census 2020 block data provided by NCTCOG.
- **Improved property**: Includes all developed properties according to local parcel data from the Collin County Central Appraisal District. The information has been expressed in terms of the total assessed value of improvements that may be exposed to the identified hazards.
- **Emergency facilities**: Includes fire stations, police stations and hospitals, provided by the Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.
- **Critical facilities**: Includes schools and historic places provided by Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions. These are non-emergency facilities, but still provide critical services and functions for vulnerable sectors of the population.
- **Critical infrastructure**: Includes airports, natural gas facilities, wastewater facilities, potable water treatment facilities, wastewater treatment facilities, dams, and bridges. Data for all critical facilities was obtained from Regional Hazard Assessment Tool, Collin County Emergency Management Coordinator, and participating jurisdictions.

The following tables provide a breakdown by municipal jurisdiction of the geo-referenced assets that were used for the vulnerability assessment.

Population

According to the US Census Bureau, the total population of the City of Wylie in 2020 was 53,067 people, with 19,113 households. The count breakdown by municipal jurisdiction is provided in *Table 3.4.*

Table 3.4 Collin County Population Counts

Jurisdiction	Population			Households		
	Population	% of County Total	Population Density (Sq. Mile)	Household	% of County Total	Household Density (Sq. Mile)
Wylie	53,067	4.44%	1340.36	17,084	4.44%	471.96

Source: US Census Bureau & Collin County Appraisal District

Table 3.5 summarizes population counts and population chance (absolute and percent predictions for Collin County).

Table 3.5 Population Predictions

Jurisdiction	Population 2010 Census	Population 2018 Estimate	Population 2019 Estimate	Absolute Change 2018-2019	Percent (%) Change 2018-2019
Wylie	41,427	49,500	51,730	2,230	4.51%

Source: 2020 NCTCOG Population Estimates

Property

There are an estimated 17,130 parcels in Wylie, with an estimated $4,065,640,595 in total assessed value of, *Table 3.6* lists the total number and percentage of parcels by jurisdiction.

Table 3.6 Parcel Counts and Improvements Value

Jurisdiction	Number of Parcels	% of County Total	Total Assessed Value of Improvements (Buildings)
Wylie	17,130	4.09%	$4,065,640,595

Source: Collin County Appraisal District

Emergency Facilities

There are 5 identified emergency facilities in the City of Wylie, including 3 fire stations, 1 police station (including communications), and 1 hospital. *Table 3.7* presents the distribution of emergency facilities by jurisdiction. Geographic coordinates were used to determine the location of each facility.

Table 3.7 Emergency Facilities

Jurisdiction	Fire Stations	Police Stations	Hospitals
Wylie	3	1	1

Source: County Data and Regional Hazard Assessment Tool

Critical Facilities

There are 29 critical facilities, which are considered non-emergency in Wylie. The critical facilities include 20 schools and 9 historical property sites (*Table 3.8*). Geographic coordinates (i.e., latitude and longitude) were used to determine the location of each facility.

Table 3.8 Critical Facilities

Jurisdiction	Schools	Historical Property
Wylie	20	9

Source: Local jurisdictions

Critical Infrastructure

There are two identified critical infrastructure facilities in Wylie, including zero airports, zero natural gas facilities, one water treatment facilities, one wastewater treatment facilities, two dams, and zero railway/highway bridges (*Table 3.9*).

Table 3.9 Critical Infrastructure

Jurisdiction	Airports	Natural Gas Facilities	Wastewater Treatment Facilities	Potable Water Treatment Facilities	Dams	Railway/ Highway Bridges
Wylie	0	0	1	1	2	0

Source: Local jurisdictions

Methodology

Based on the type of information available for analysis, Collin County's vulnerability assessment was conducted using two distinct methodologies, a Geographic Information System-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation of historical occurrence information provided by National Centers for Environmental Information, the Texas Forest Service, and the FEMA Resilience and Planning Tool. The results of the vulnerability assessment are provided by jurisdiction for each hazard analyzed.

Of the 12 hazards evaluated for Collin County, four were analyzed using a Geographic Information System-based analysis, 5 using a statistical risk assessment methodology, and the remaining 3 using qualitative analysis. Qualitative analysis was used due to lack of information, the inability to define specific areas of risk, and/or inexistence of historical records. Additional information regarding these 3 hazards is unattainable at the present time; studies to address this data deficiency are noted as action items in this update. *Table 3.10* summarizes the methodology used for each hazard.

Table 3.10 Analysis used for Vulnerability Assessment Collin County

Hazard	Geographic Information System-based Analysis	Statistical Analysis	Qualitative Analysis
Dam Failure			X
Drought	X		
Earthquake			X
Expansive Soils			X
Extreme Heat		X	
Flooding	X		
Hail	X		

High Winds		X	
Lightning		X	
Tornado		X	
Wildfire	X		
Winter Storms		X	

Summary of Vulnerably Assessment

A summary of the vulnerability assessment for each hazard using geographic and statistical analysis is presented in the following pages. The detailed assessment is presented in the following sections.

Summary Table 3.11

Drought	
Population	According to National Centers for Environmental Information (NCEI) no recorded injuries or fatalities have been recorded for drought events. There are no personal losses expected from drought events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Wylie are expected but financially unknown due to lack of accurate reporting; however county-wide property loss is estimated at $21,208.33 per year. Historical data indicates that crop losses in the City of Wylie are expected mostly during water shortages, financially unknown due to lack of accurate reporting however county-wide crop loss is estimated to be $58,916.67 per year.
Emergency Facilities	Because of the nature of this hazard, no losses are expected on emergency facilities but foundation issues could occur due to drought events.
Critical Facilities	Because of the nature of this hazard, no losses are expected on critical facilities but foundation issues could occur due to drought events.
Critical Infrastructure	Because of the nature of this hazard, no losses are expected on critical infrastructure but foundation issues and road degradation could occur due to drought events.

Summary Table 3.12

Extreme Heat	
Population	According to National Centers for Environmental Information (NCEI), there were four (4) county-wide fatalities recorded due to extreme heat, none from the City of Wylie. The City of Wylie and its population are vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to developed areas and the improved property in the City of Wylie is not vulnerable to this hazard.

Emergency Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings and the emergency facilities in the City of Wylie are not vulnerable to this hazard.
Critical Facilities	According to National Centers for Environmental Information (NCEI), there is no impact of extreme heat to buildings, and the critical facilities in the City of Wylie are not vulnerable to this hazard.
Critical Infrastructure	According to National Centers for Environmental Information (NCEI) there is no impact of extreme heat to critical infrastructure, and vulnerability to this hazard is considered minimal in the City of Wylie.

Summary Table 3.13

Flooding	
Population	Flooding produces an expected annualized count of zero (0) fatalities and injuries per year. Approximately 427 residential parcels in the City of Wylie are located within the 100-year floodplain.
Improved Property	There have been five (5) recorded flood events in the City of Wylie. Property losses are expected at $2,800 per year however these values are underestimated due to lack of accurate reporting. No crop losses are expected or recorded. Approximately $60,830,722 of the total assessed value is at risk from the 100-year storm event.
Emergency Facilities	Emergency facilities have the potential to be at risk in the 100-year storm event.
Critical Facilities	Critical facilities have the potential to be at risk in the 100-year storm event.
Critical Infrastructure	Critical Infrastructure has the potential to be at risk in the 100-year storm event.

Summary Table 3.14

Hail	
Population	According to the National Centers for Environmental Information (NCEI), no injuries or fatalities have been recorded for hailstorm events. There are no personal losses expected from hailstorm events.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Wylie are expected at $7,573,171.43 per year however these values are underestimated due to lack of accurate reporting. All improved property is vulnerable to this hazard. Although some crops are susceptible to hail hazards, available historical data for Wylie indicates that there are no expected crop losses from this event.

Emergency Facilities	Because of the unpredictability of the geographical location of hailstorms, all emergency facilities in the City of Wylie are vulnerable to this hazard.
Critical Facilities	Because of the unpredictability of the geographical location of hailstorms, all critical facilities in the City of Wylie are vulnerable to this hazard.
Critical Infrastructure	Because of the unpredictability of the geographical location of hailstorms, all critical infrastructures in the City of Wylie are vulnerable to this hazard.

Summary Table 3.15

High Wind	
Population	According to the National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from high wind events. All the population of the City of Wylie are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Wylie are expected at $900 per year however these values are underestimated due to lack of accurate reporting. No crop losses resulted from this hazard in the City of Wylie.
Emergency Facilities	Because of the expected geographical widespread nature of high winds, all emergency facilities in the City of Wylie are vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of high winds, all critical facilities in the City of Wylie are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of high winds, all critical infrastructures in the City of Wylie are vulnerable to this hazard.

Summary Table 3.16

Lightning	
Population	According to the National Centers for Environmental Information (NCEI), there are no recorded injuries or fatalities from lightning events. All the population of the City of Wylie are vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Wylie are expected but unknown due to lack of accurate reporting.
Emergency Facilities	Because of the expected geographical widespread nature of lightning, all emergency facilities in the City of Wylie are vulnerable to this hazard.

Critical Facilities	Because of the expected geographical widespread nature of lightning, all critical facilities in the City of Wylie are vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of lightning, all critical infrastructures in the City of Wylie are vulnerable to this hazard.

Summary Table 3.17

Tornado	
Population	According to National Centers for Environmental Information (NCEI), there have been no recorded injuries or fatalities from tornado events in the City of Wylie. All the population of the City of Wylie is exposed and vulnerable to this hazard.
Improved Property	According to National Centers for Environmental Information (NCEI), an average loss of $7,142.86 per year in property losses is expected to result from tornado events. No crop losses are expected from this hazard in the City of Wylie.
Emergency Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all emergency facilities in the City of Wylie are exposed and vulnerable to this hazard.
Critical Facilities	Because of the impossibility to predict the geographical area of impact for tornados, all critical facilities in the City of Wylie are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the impossibility to predict the geographical area of impact for tornados, all critical infrastructures in the City of Wylie are exposed and vulnerable to this hazard.

Summary Table 3.18

Wildfire	
Population	Based on geographical data, approximately 38.07% of the City of Wylie is vulnerable to wildfires. There have been no recorded injuries or fatalities due to wildfires.
Improved Property	Based on historical data, annual financial losses expected from property loss due to wildfires are unknown due to lack of accurate reporting; therefore, the percentage of the overall property improvement values across the City of Wylie are also unknown.
Emergency Facilities	Based on geographic information there are two fire stations, one police station, and one hospital at risk from wildfire events.
Critical Facilities	Based on geographic information there are 17 schools and 15 historical properties at risk from wildfire events.

Critical Infrastructure	Based on geographic information there are no bridges, no dams, one wastewater treatment facility, and no water treatment facility at risk from wildfire events.

Summary Table 3.19

Winter Storm	
Population	According to National Centers for Environmental Information (NCEI), there was one (1) county-wide fatality recorded due to winter storms, none from the City of Wylie. All the population of the City of Wylie are exposed and vulnerable to this hazard.
Improved Property	According to the National Centers for Environmental Information (NCEI), property losses in the City of Wylie are expected but unknown due to lack of reporting; however county-wide property loss is estimated at $116,250 per year. No crop losses are expected from this hazard in the City of Wylie.
Emergency Facilities	Because of the expected geographical widespread nature of winter storms, all emergency facilities in the City of Wylie are exposed and vulnerable to this hazard.
Critical Facilities	Because of the expected geographical widespread nature of winter storms, all critical facilities in the City of Wylie are exposed and vulnerable to this hazard.
Critical Infrastructure	Because of the expected geographical widespread nature of winter storms, all critical infrastructures in the City of Wylie are exposed and vulnerable to this hazard.

4. Capability Assessment

The risk assessment and capabilities assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the City of Wylie considered not only its level of hazard risk but also the existing capabilities to minimize or eliminate that risk.

Table 4.1 Legal and Regulatory Capability Summary

Legal and Regulatory Capabilities															
Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances wildfire ordinances, hazard setback requirements)	Growth management ordinances (also called "smart Growth" or anti-sprawl programs)	Site Plan review requirements	General or comprehensive plan	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Real estate disclosure requirements	Other	% Yes per Jurisdiction
Wylie	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	**71%**
Average % Yes Capabilities – 71%															
Y- Yes N- No ?- Don't Know															

Table 4.2 Administrative and Technical Capability Summary

Administrative and Technical Capabilities											
Jurisdiction	Planner(s) or engineer(s) with knowledge of land development and land management	Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planners or engineer(s) with an understanding of natural and/or human caused hazards	Floodplain manager	Surveyors	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS	Scientists familiar with the hazards of the community	Emergency manager	Grant writers	% Yes per Jurisdiction
Wylie	Y	Y	Y	Y	N	Y	Y	N	Y	Y	**80%**
Average % Yes Capabilities – 80%											
Y- Yes N- No ?- Don't Know											

Table 4.3 Fiscal Capability Summary

Fiscal Capabilities											
Jurisdiction	Community Development Block Grants (CDBG)	Capital improvements project funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric service	Impact fees for homebuyers or developers for new developments/homes	Incur debt through general obligation bonds	Incur debt through special tax bonds	Incur debt through private activity bonds	Withhold spending in hazard-prone areas	Other	% Yes per Jurisdiction
Wylie	N	Y	N	Y	N	N	N	N	Y	N	**20%**
Average % Yes Capabilities – 20%											
Y- Yes N- No ?- Don't Know											

To quantify Wylie's legal and regulatory, administrative and technical, and fiscal capabilities, an overall rating system was administered for each category: limited (0-30%), moderate (31-70%), and strong (70-

100%). Questionnaire responses indicated that on average, Wylie has 71.42% of identified legal and regulatory capabilities, 80% of identified administrative and technical capabilities, and 20% of identified fiscal capabilities.

Table 4.4 Administrative Information

Jurisdiction	Chief Administrative Officer	Ability to Implement Capabilities
City of Wylie	City Manager	The city manager, along with Directors (department heads), address the budget; pass ordinances and codes; hire staff; approve plans; and determine the direction of the city overall. As the governing body, the ability to implement and approve mitigation actions, expand mitigation activities and programs, and integrate mitigation into existing policies and programs is a function of this group.

Specific actions that can expand and improve existing capabilities, authorities, plans, policies, and resources for mitigation include: budgeting and passing policies and procedures, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates and additions to existing plans as new needs are recognized.

5. Mitigation Strategies

Based on the results of the risk and capability assessments, and reviews of the goals and objectives included in the 2016 HazMAP, the Wylie Hazard Mitigation Planning Committee developed mitigation strategies for the plan update.

Goal 1 Reduce or eliminate loss of life, injuries and property damage resulting from severe weather events.

Objective 1-A Provide adequate warning and communication before, during, and after a hazard event.
Objective 1-B Expand and coordinate early warning systems currently in use.
Objective 1-C Reduce or eliminate loss of life and property damage from tornadoes through the construction and use of safe rooms or shelter areas.

Goal 2 Protect existing and new properties from the effects of all natural hazards.

Objective 2-A Conduct studies to determine hazard and vulnerability threat assessment for all natural hazards.
Objective 2-B Rehabilitate or retrofit identified high hazard critical infrastructure.
Objective 2-C Enact and enforce regulatory measures that enforce hazard mitigation measures.
Objective 2-D Construct enhancements or additions to current and new facilities which mitigate the effects of natural hazards.
Objective 2-E Maintain NFIP compliance, storm water management, and implement drainage projects.

Goal 3 Reduce losses and repetitive damages for chronic hazard events.

Objective 3-A Conduct a hazard/vulnerability assessment of personal properties and structures located in flood zones.
Objective 3-B Develop and implement a buyout program for those personal properties and structures located in high hazard flood zones starting with those that are most vulnerable to life and property loss.
Objective 3-C Develop and execute new programs which identify and reduce threats from natural hazards.

Goal 4 Develop public education campaigns to disseminate information about actions to mitigate potential loss of life, injuries and property damage resulting from natural hazards.

Objective 4-A Educate the public on risks, threats, and vulnerability from all natural hazards.
Objective 4-B Educate the public on actions they can take to prevent or reduce the loss of life or property from all natural hazards.
Objective 4-C Develop and implement a community education campaign to heighten public awareness about chronic flooding and options for insurance coverage to protect their personal properties as well as long term benefits from a buyout program.

6. Action Items

Below is a list of the new and deferred action items identified for the HazMAP Update. Each of the actions in this section were prioritized based on FEMA's STAPLEE criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As part of the STAPLEE analysis economic considerations were weighed for each action. The STAPLEE was used for the 2016 Plan along with the 2021 Update. Priority rankings are classified as indicated in the table below.

Priority	Description
High	Benefits of mitigating risk of death or severe bodily injury outweigh costs to implement actions rated as high priorities.
Medium	Reducing vulnerability to threats and the resulting improvement in quality of life and peace of mind are benefits for actions rated as medium priorities.
Low	Awareness of low risk/low impact hazards offer benefits of time to assess, plan and integrate low priority mitigation actions as time, need, and funding permit.

City of Wylie Action Items: Deferred from 2016 Plan

City of Wylie Action Item	Add outdoor warning sirens to meet the needs of the growing population in newly developed areas and/or subdivisions.
Hazard(s) Addressed	Tornado, Hail, High Winds, Dam Failure, Lightning, Flooding, Wildfire
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$30,000 per siren
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Outdoor warning systems will help alert the public to reduce personal and property damage before a disaster strikes.
Status	Two Sirens and software have been added or in the process of being added. Continue to add additional sirens as needed based on population needs.

City of Wylie Action Item	Adopt and implement water conservation regulations

Hazard(s) Addressed	Drought
Goal/Objective	2-C, 3-C
Priority	High
Estimated Cost	$7,500 to $15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Minimal compared to benefit to community
Discussion	This will mitigate drought conditions.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$7,500-$15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.
Status	Receive supplies and materials from the NCTCOG KnoWhat2do Program and provide to residents. Continue – will be included in 2021

City of Wylie Action Item	Develop and implement an extreme temperature program that provides resources and identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, NPO donations, In-kind
Lead Department	Emergency Management, Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of the program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Watershed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind
Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds
Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.

Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
Potential Matching Sources	Local funds, in-kind, donations, citizen cost-share
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information
Status	Deferred – will be included in 2021 Plan

City of Wylie Action Items: New

City of Wylie Action Item	Add outdoor warning sirens to meet the needs of the growing population in newly developed areas and/or subdivisions.
Hazard(s) Addressed	Tornado, Hail, High Winds, Dam Failure, Lightning, Flooding, Wildfire
Goal/Objective	1-A, 1-B
Priority	High
Estimated Cost	$30,000 per siren
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years

Effect on Old Buildings	None
Effect on New Buildings	None
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Outdoor warning systems will help alert the public to reduce personal and property damage before a disaster strikes. This action item would be specific to installation/placement of new OWS sirens in the jurisdiction.

City of Wylie Action Item	Adopt and implement water conservation regulations
Hazard(s) Addressed	Drought, Expansive Soils
Goal/Objective	2-C, 3-C
Priority	High
Estimated Cost	$7,500 to $15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Will identify need for retrofits, such as low-flow plumbing
Effect on New Buildings	May require new codes for low-flow plumbing and foundation integrity
Cost Effectiveness	Minimal compared to benefit to community
Discussion	This will mitigate drought conditions. When water is conserved and not used for landscape during droughts, this would provide water for homeowners to use, through drip irrigation, to keep their foundations at a consistent saturation level, mitigating the impacts of drought and lack of water.

City of Wylie Action Item	Develop and implement a comprehensive public education program to educate on the actions to help mitigate the impacts of each identified hazard.
Hazard(s) Addressed	Tornado, Hail, Winter Storms, High Winds, Dam Failure, Lightning, Expansive Soils, Extreme Heat, Earthquake, Flooding, Wildfire, Drought
Goal/Objective	4-A, 4-B, 4-C
Priority	High
Estimated Cost	$7,500-$15,000
Potential Funding Sources	General Fund
Potential Matching Sources	None
Lead Department	Emergency Management

Implementation Schedule	2-3 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
Effect on New Buildings	Depending on mitigation actions taken for structures, can make new building safer, stronger and less vulnerable to damages
Cost Effectiveness	Minimal compared to preservation of life safety
Discussion	Public education can help educate the public to reduce personal and property damage during disasters. Program will include information about hazard mitigation.

City of Wylie Action Item	Develop and implement an extreme temperature program that provides resources and identifies locations for vulnerable residents to go to during periods of extreme temperatures.
Hazard(s) Addressed	Extreme Heat, Winter Storms
Goal/Objective	2-D
Priority	Medium
Estimated Cost	$10,000-$15,000
Potential Funding Sources	HMGP, PDM
Potential Matching Sources	Local funds, NPO donations, In-kind
Lead Department	Emergency Management, Planning
Implementation Schedule	1-2 years
Effect on Old Buildings	Could require retrofit to accommodate required space and resources
Effect on New Buildings	May entail enhanced construction materials
Cost Effectiveness	Cost to implement this program is low compared to the benefits of the program.
Discussion	Cooling shelters would allow special populations to reduce their vulnerability to extreme heat, as warming centers would aid residents in extreme cold.

City of Wylie Action Item	Hire consultant to complete new inundation studies of all high and moderate hazard dams.
Hazard(s) Addressed	Dam Failure, Flood
Goal/Objective	3-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	HMPG, Watershed Authorities, Dam Sponsors
Potential Matching Sources	Local Sponsors, In-Kind

Lead Department	Planning and Zoning/ NRCS, Emergency Management
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will determine what mitigation actions are needed to protect existing buildings in inundation zones
Effect on New Buildings	Results will determine what mitigation actions are needed for new buildings in inundation zones
Cost Effectiveness	Low
Discussion	Dam Failure data deficiency identified in Chapter 3. Identify all structures and infrastructures that would be impacted by a potential dam failure.

City of Wylie Action Item	Conduct earthquake assessment study to determine potential for earthquakes to affect public facilities and utilities.
Hazard(s) Addressed	2-A
Goal/Objective	Earthquake
Priority	Low
Estimated Cost	$20,000
Potential Funding Sources	HMGP
Potential Matching Sources	Local Funds
Lead Department	Public Works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Results will help identify/define retrofits or additions to reduce vulnerability to earthquakes
Effect on New Buildings	Results will identify/define codes for new construction to reduce vulnerability to earthquakes
Cost Effectiveness	Low
Discussion	Project outputs will guide development of future earthquake mitigation projects.

City of Wylie Action Item	Conduct a soil analysis to determine the scope, impact, and extent of expansive soils
Hazard(s) Addressed	Expansive Soils
Goal/Objective	2-A
Priority	Low
Estimated Cost	$10,000
Potential Funding Sources	Federal grants, state grants
Potential Matching Sources	Local funds

Lead Department	Emergency management, Public works, Planning Zoning
Implementation Schedule	1-2 years
Effect on Old Buildings	Study would identify existing construction most at risk for expansive soil damage.
Effect on New Buildings	Study would be used to identify undeveloped areas at risk for expansive soil damage for real estate disclosure.
Cost Effectiveness	High. This study would lead to targeted mitigation projects to lower vulnerability to expansive soils.
Discussion	Study would be used to identify scope, impact, and extent of expansive soils throughout jurisdiction.

City of Wylie Action Item	Purchase and Distribute NOAA Weather Radios to Vulnerable Residents
Hazard(s) Addressed	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
Goal/Objective	1-A
Priority	High
Estimated Cost	$75,000
Potential Funding Sources	Grant Funds, HMPG, PDM, Partial payment by receiving party
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Lead Department	Emergency Management
Implementation Schedule	2-5 years
Effect on Old Buildings	Depending on mitigation actions taken for structures, can make existing building safer, stronger and less vulnerable to damages through retrofits
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Cost Effectiveness	Advanced warning and mitigation information saves lives which outweighs the cost of a radio.
Discussion	Weather Alert Radios are a proven means to alert and warn citizens and provide information about severe weather as well as provide other emergency and hazard information

National Flood Insurance Program (NFIP) Compliance

Wylie is participating in the National Flood Insurance Program and has identified their respective areas as vulnerable to flooding. This is incorporated into all current and future planning for dealing with repetitive loss vulnerabilities.

Table 6.1 NFIP Compliance

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
480759#	WYLIE, CITY OF	ROCKWALL COUNTY/DALLAS COUNTY/COLLIN COUNTY	11/12/1976	6/4/1980	7/7/2014	6/4/1980	No

Source: http://www.fema.gov/cis/TX.html

Jurisdiction Activities

In order to maintain eligibility with NFIP, jurisdictions are required to maintain their list of properties that hold a policy with NFIP, along with up-to-date maps of the floodplains in the jurisdictions. Each jurisdiction participating in the Collin County Hazard Mitigation Action Plan completes this basic requirement and has the information on file with the jurisdiction's designated floodplain manager. Using this plan, participating jurisdictions will be able to continue their compliance with NFIP by implementing damage control measures and to take action to minimize the effects of flooding in their respective jurisdictions.

Table 6.2 NIFP Activity

Jurisdiction	Community Floodplain Administrator	NFIP Activity	Activity Description	Enforcement
City of Wylie	City Engineer	Complete and maintain FEMA elevation certificates for pre-FIRM and or post-FIRM buildings	Permits are issued through the Building Dept. The City requires a residential structure to have the lowest floor elevated at least 2 feet above the base flood elevation. Non-residential is the same or be designed so that below the base flood level the structure is watertight with the walls substantially impermeable to the passage of water.	NFIP compliance is implemented and enforced through a process of floodplain identification using FEMA floodplain maps, permit issuance, building requirements, and compliance inspections pending approval. Failure to comply with City's flood ordinance can
		Floodplain development permits	Permits are required for any new construction in a floodplain.	
		Coordinate with FEMA in identifying	The City of Wylie attends meetings held by FEMA	

		Special Flood Hazard Areas for future FIRM maps	and/or their contractors to better identify areas that are flood prone that are not shown on current Flood Insurance Rate Maps.	shall result in a fine up to $2,000.
		Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning	Maintain road closures to known flood prone areas. Use public outreach via Nixle for flash flood warnings.	
		Future Mitigation Projects	The City of Wylie will continue to monitor for new areas of flooding that have not been previously identified for mitigation.	

7. Plan Maintenance

Monitoring, Evaluating and Updating the Plan

In Compliance with requirement § 201.6(c)(4)(i), Collin County has developed a plan maintenance process which is described in the following paragraphs. Collin County, along with participating jurisdictions are responsible for monitoring implementation of the plan, executing a yearly evaluation of its effectiveness, and updating the plan within a 5-year cycle.

Following formal adoption by Collin County Commissioners Court, and formal adoption of the plan by City Council by each participating jurisdiction, the actions outlined in the Collin County Hazard Mitigation Plan would be implemented by the county and participating jurisdictions as described throughout this document.

The Collin County Emergency Management Coordinator, working in conjunction with the respective jurisdictions, will be responsible for ensuring the mitigation plan is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by calling an annual meeting of the planning committee, whose members will provide assistance and expertise for plan review, evaluating, updating, and monitoring. This meeting will be open to the public and public notices will encourage community participation. During this annual meeting, Wylie will provide information on the implementation status of each action included in the plan. As part of the evaluation, the planning committee will assess whether goals and objectives address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the plan, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the timetable presented below:

Table 7.1 Plan Maintenance Timeline

Personnel	Activity	Schedule
Emergency Management Coordinator	Monitoring Plan : Track implementation and action items, changes to risk assessment, changes to planning team members, changes to capabilities, plan integrations	Biannually
	Evaluate Plan: Assess effectiveness by evaluating completed actions, implementation processes, responsible personnel and lessons learned.	Annually
	Update Plan	Once every 5 years

At least once every five (5) years, or more frequently, if such a need is determined by the participating jurisdiction, the multi-jurisdictional plan will undergo a major update. During this process, all sections of the plan will be updated with current information, analyses done and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for state and federal review and approval, and presented for approval to the Collin County Commissioner's Court and the respective councils of incorporated cities/towns included in the Collin County plan. Each participating jurisdiction will undertake the same process for reviewing, revising and updating their respective plans and submitting them for approval. The plans will be updated every five years in accordance with federal requirements.

Plan Incorporation into Existing Planning Mechanisms *(In compliance with 201.6(c)(4)(ii))*

2016 Plan Incorporation: The vulnerability and capabilities assessments for each jurisdiction were carefully reviewed and considered when developing the mitigation actions for this plan. The HMPT and planning committees have established a process in which the mitigation strategy, goals, objectives and actions outlined in this plan will be incorporated into existing local planning strategies and mechanisms, as appropriate. Those mechanisms include the following:

Table 7.2 Plan Incorporation Mechanisms

Jurisdictions	Responsible Personnel	Jurisdictional Plans	Integration Schedule	Integration Plan
City of Wylie	City Council	Budget	Annually	Integration of mitigation projects identified in HazMAP, grants, and other fiscal allowances for mitigation actions and related costs
	Emergency Management Coordinator	Emergency Action Plan	Every Five Year	EAP Mitigation annex updates based on HazMAP HIRA; update preparedness, response and recovery actions related to identified hazards
	Designated Floodplain Manager	Floodplain Ordinances	As needed	Enhance mitigation of flood hazards using HazMAP flood data for floodplain management and community development.
	City Council, Director of Planning	Capital Improvement Plan	Annually	Strengthen critical infrastructure and key resources based on HazMAP hazard analysis, incorporate vulnerability data and action items.
	Public Works Director, City Council	Drought Contingency Plan	Assessed annually and updated as needed.	Integrate drought actions such as xeriscaping, water restrictions, and public education
	Planning Director, City Council	Natural Resource Conservation Plan	Assessed annually and updated as needed.	Integrate conservation measures by directing development away from hazard-prone areas identified in HazMAP.

Although it is recognized there are many possible benefits to integrating components of this HazMAP into other planning mechanisms, the Wylie Hazard Mitigation Planning Committee considers this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

The process described here is the same as was used since the last planning update.

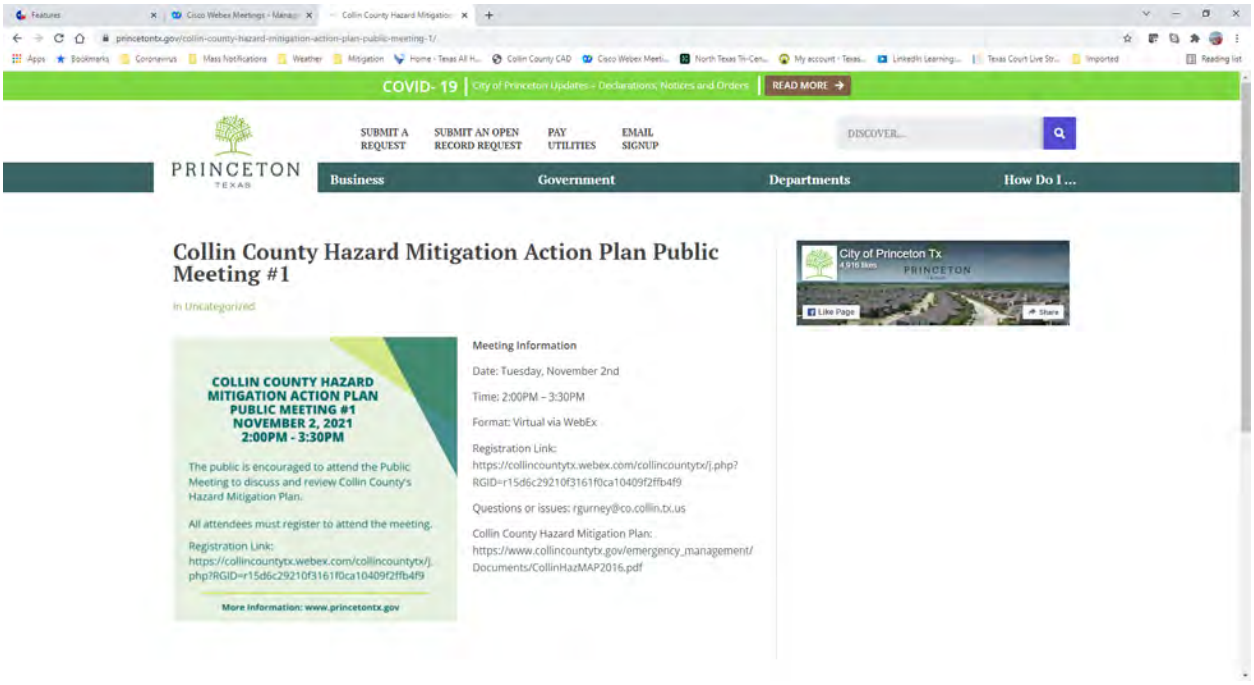
Continued Public Involvement (In compliance with 201.6(c)(4)(iii))

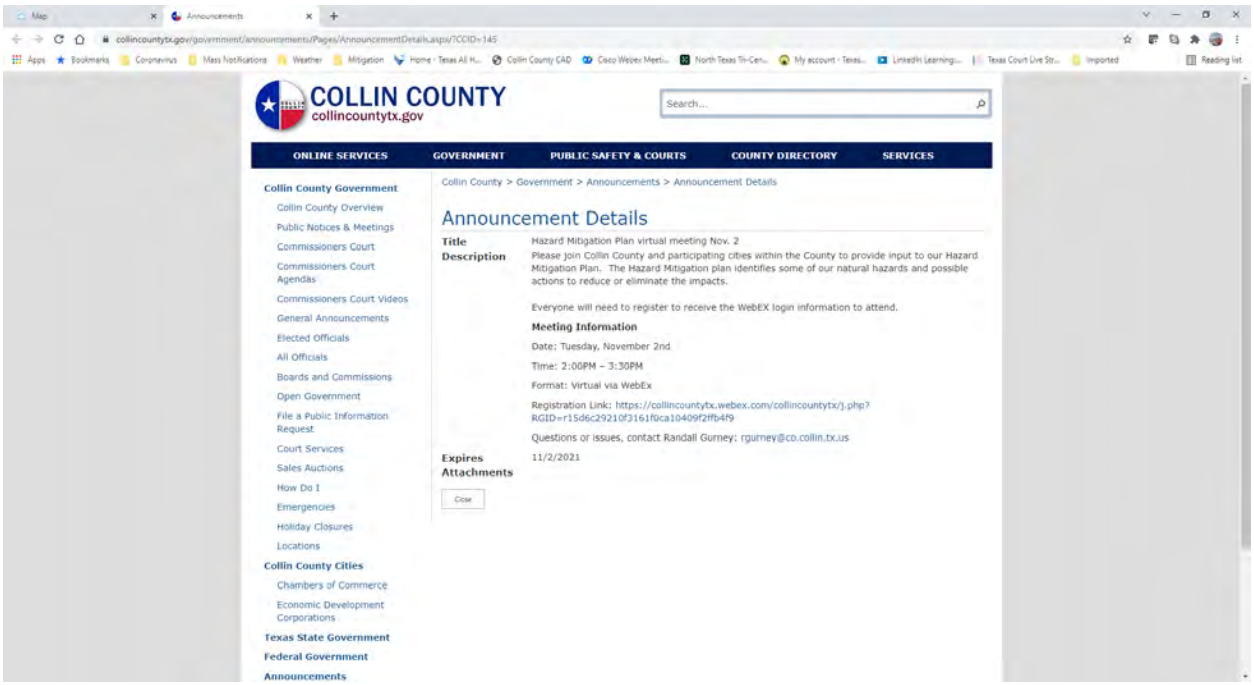
As stated in requirement § *201.6(c)(4)(iii)* The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

To address this requirement, ongoing public participation will be encouraged throughout the entire planning and implementation process. A copy of the plan will be provided on the Collin County website. The planning team and committees will continue meeting on a regular basis to ensure the successful implementation of the plan and to discuss any additional issues regarding the emergency management of Collin County. The annual meetings for monitoring, evaluating, and updating the plan will be open to the public and public notices will encourage community participation.

Planning Process Documents

Public Meeting #1 Announcement

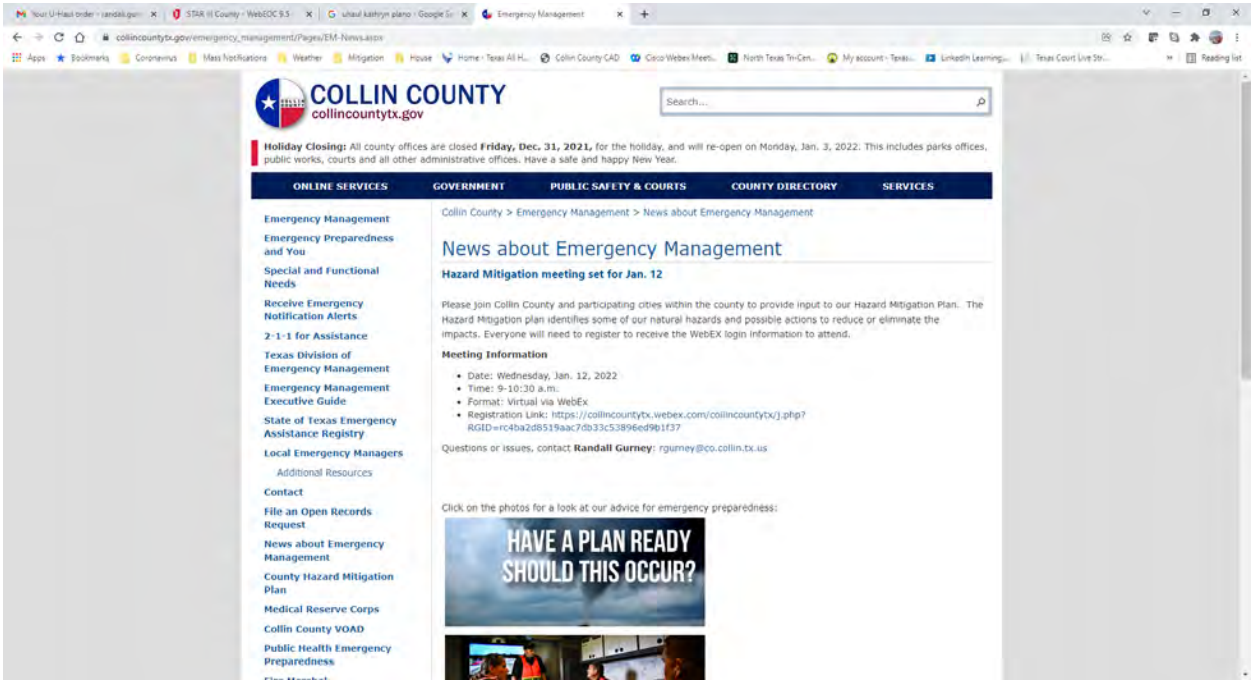




Public Meeting #1 Attendees

Name	Email Address	City
Edie Sims	esims@blueridgecity.com	Blue Ridge
Alexa Bach	kyrosalexa@gmail.com	Plano
Simon Katz	skatz@parkertexas.us	Parker
Meredith Nurge	mnurge@co.collin.tx.us	Collin County
Amanda Meldrum	ameldrum@friscofire.com	Frisco
Janis Cable	jcable@lowrycrossingtexas.org	Lowry Crossing
Dustin Lankford	dlankford@princetontx.us	Princeton
Eric Everson	eeverson@celina-tx.gov	Celina
Kent Bauer	kbauer@prospertx.gov	Town of Prosper
Perry Elliott	pelliott@murphytx.org	Murphy
Dustin Butler	dbutler@csmediatexas.com	Wylie
Elizabeth Carlberg	ecarlberg@co.collin.tx.us	McKinney
Adam Wilbourn	awilbourn@fairviewtexas.org	Fairview
Carol King	carol.king@newhopetx.gov	McKinney
Dustin Butler	dbutler@csmediatedas.com	Princeton
Lance Gant	lgant@lucastexas.us	Lucas
Kim Dobbs	kdobbs@lavontx.gov	Lavon
Tenishea Turner	tturner@princetontx.us	Princeton
Carl Nix	cnix@cityofmelissa.com	Melissa
Brittany Elliott	belliott@cityofmelissa.com	Melissa
Cody Nelson	cnelson@annatexas.gov	Anna
Jason Lane	jlane@friscofire.com	Frisco
Randall Gurney	rgurney@co.collin.tx.us	McKinney

Public Meeting #2 Announcement



Public Meeting #2 Attendees

Name	Email Address	City
Danny Anthony	danthony@lavontx.gov	Lavon
Danny Anthony	danthony@cityoflavon.gov	Lavon
Danny Anthony	danny.anthony@lavonvfd.org	lavon
Gina Zimmel	gzimmel@collincountytx.gov	
LeAnn Strait	townhall@stpaultexas.us	St Paul
Dustin Butler	dbutler@csmediatexas.com	Wylie
Connor Pittman	cpittman@csmediatexas.com	
Pandora Wilson	pawski1@gmail.com	McKinney
Adam Wilbourn	awilbourn@fairviewtexas.org	Fairview
Barry KOFFROTH	bkoffroth@gmail.com	PROSPER
Amy Bartley	abartley95@gmail.com	Prosper
Leigh Ann Nolen	lnolen@co.collin.tx.us	Collin County
Yoon Kim	ykim@co.collin.tx.us	McKinney
Elizabeth Carlberg	ecarlberg@co.collin.tx.us	McKinney
T Scally	wiztoms@hotmail.com	Princeton
Tom Harvey	tharvey@princetontx.us	Princeton
Dustin Lankford	dlankford@princetontx.us	Princeton
Carol King	carol.king@newhopetx.gov	New Hope
Kim Dobbs	kdobbs@lavontx.gov	LAVON
Amanda Meldrum	ameldrum@friscofire.com	Frisco
Jason Lane	jlane@friscofire.com	Frisco
Eric Everson	eeverson@celina-tx.gov	Celina
Lance Gant	lgant@lucastexas.us	Lucas
Randall Gurney	rgurney@co.collin.tx.us	McKinney

Meeting News Report

TDEM
THE TEXAS A&M UNIVERSITY SYSTEM

May 17, 2022

The Honorable Chris Hill
Judge, Collin County
2300 Bloomdale Rd.
McKinney, TX 75071

RE: Approvable Pending Adoption of Collin County, Texas Multi-Jurisdiction Hazard Mitigation Plan (HMP)

Funding Source: n/a

Judge Hill:

Congratulations! FEMA has concluded the review of the Collin County, Texas Multi-Jurisdiction HMP, and the plan is found to be approvable pending adoption. For this plan to receive final FEMA approval, the jurisdictions must adopt this plan and submit the complete adoption package to the state within 90 days. The plan update timeline will begin on the date of the FEMA approval letter. Please e-mail the complete adoption package to HM-Plans@tdem.texas.gov as follows:

- The final plan formatted as a single document
  - Plan must be dated to match the date of the first adoption
  - Remove track changes, strikethroughs, and highlights
- All signed resolutions as a separate single document

The previous review tool may contain recommendations to be applied to your next update. DO NOT make any further changes to your plan until it has been approved.

If you have any questions concerning this procedure, please do not hesitate to contact me at jim.guin@tdem.texas.gov. We commend you for your commitment to mitigation.

Respectfully,



Jim Guin
Hazard Mitigation Supervisor
Hazard Mitigation Division
Texas Division of Emergency Management

Cc: Kevin Enoch, kevin.enoch@tdem.texas.gov
Sara Haak, sara.haak@tdem.texas.gov
Rory Halpin, rory.halpin@tdem.texas.gov

U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209

FEMA

May 16, 2022

Jasper Cooke, Hazard Mitigation Section Chief
Texas Division of Emergency Management
P.O. Box 15467
Austin, TX 78761

RE: Approvable Pending Adoption of the Collin County, Texas Multi-Jurisdiction Hazard Mitigation Plan

Dear Mr. Cooke:

This office has concluded its review of the referenced plan, in conformance with the Final Rule on Mitigation Planning (44 CFR § 201.6). Formal approval of this plan is contingent upon the adoption by the participants on Enclosure A, as well as the receipt of the final draft of the plan containing all plan components.

Adopting resolutions must be submitted to this agency for review and approval no later than one year from the date of this letter. Failure to submit these resolutions in a timely manner could lead to a required update of the plan prior to FEMA approval.

Once this final requirement has been met, a letter of official approval will be generated. The Local Hazard Mitigation Planning Tool, with the reviewer's comments has been enclosed to further assist the jurisdictions in complying with planning requirements.

Sincerely,

Ronald C. Wanhanen
Chief, Risk Analysis Branch

Enclosures

Enclosure A

Attached is the list of participating local governments included in the May 16, 2022 review of the referenced Hazard Mitigation plan.

	Community Name
1)	Allen city
2)	Anna city
3)	Blue Ridge city
4)	Celina city
5)	Collin County
6)	Fairview town
7)	Farmersville city
8)	Frisco city
9)	Josephine city
10)	Lavon city
11)	Lowry Crossing city
12)	Lucas city
13)	Melissa city
14)	Murphy city
15)	New Hope town
16)	Parker city
17)	Princeton city
18)	Prosper town
19)	St. Paul town
20)	Wylie city

Adoption Submittal (Final)

Following the issuance this of Approvable Pending Adoption letter, all participants are provided one year to adopt the plan and submit it through the State to FEMA. For multi-jurisdictional plans, multiple adoptions should be submitted as a complete package as outlined below.

The State must submit the plan files via:

Floodmaps File eXchange (FFX): https://www.floodmaps.fema.gov/ffx/

Risk Management Directorate (RMD) SharePoint:

https://rmd.msc.fema.gov/Regions/VI/Mitigation%20Planning/Forms/AllItems.aspx

Note: You will be requested to register if you have not already done so.
All plans containing Protected Critical Infrastructure Information (PCII) must be submitted through the Floodmaps File Exchange (FFX) to ensure secure file submissions.

---

1. Final draft of the plan in MS Word or pdf format containing:
   a. The final plan formatted as a single document.
   b. Documentation demonstrating adoption by the participating jurisdictions seeking approval. (i.e. copies of signed resolutions, official meeting minutes, etc.…) Note: Adoption resolutions can be separate files. Additional adoptions are not required to provide a copy of the plan.
   c. Remove strikethroughs, highlights and all Track Changes must be accepted in the final plan.

2. Send an email addressed to r6-mtd-planning@fema.dhs.gov as notification that the electronic file has been submitted. Please DO NOT send plans to the email inbox as it has very strict size limitations which will lock the inbox and not allow additional emails to be received. The email must include the following information:

   a. Include the follow when applicable: (Note: A submittal letter is no longer required.)
      i. Subject line [Approval Review for Name of Plan, State]
      ii. FEMA funding source, grant or disaster number, and project number (when applicable)
      iii. list of adopting jurisdictions
      iv. Plan File name (file name must include date submitted)

3. Submittals which do not conform to the above requirements will be returned to the State for resubmission

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for Public Works Director Gary Machado
Estimated Cost:	Date Prepared:	November 9, 2022
Exhibits:	1. Proposed Ordinance 2. Kings Crossing Development Agreement #2 3. 2007 Agreement 4. Kings Crossing Development Agrement #1	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 830 APPROVING KINGS CROSSING DEVELOPMENT AGREEMENT AMENDMENT #2.

SUMMARY

Please see information provided.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

ORDINANCE NO. 830
(Approval of Amendment #2 to Bedell Tract Development Agreement)

AN ORDINANCE OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPROVING AMENDMENT #2 TO A DEVELOPMENT AGREEMENT BETWEEN THE CITY OF PARKER, BEDELL FAMILY LIMITED PARTNERSHIP, LEWIS BEND PARTNERS, LTD., AND WARNER CAPITAL, LLC; PROVIDING A REPEALER CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, on August 21, 2007, via Resolution No. 2007-170, the City of Parker approved a Development Agreement with the Bedell Family Limited Partnership, Lewis Bend Partners, Ltd., and Warner Capital, LLC concerning property as more specifically described as Tracts 1, 2, 3, 4, and 5 therein (the "Bedell Tracts"), as attached hereto as Exhibit A (the "Development Agreement'), and

WHEREAS, on June 18, 2013, the City Council for the City of Parker, Texas approved an amendment to the Development Agreement for specific changes thereto, subject to the parties signing a revised agreement, and

WHEREAS, in November 2013, the parties signed Development Agreement Amendment #1, attached hereto as Exhibit B, effectuating the parties agreement following the June 18, 2013 council meeting; and

WHEREAS, the developer has requested additional changes to the Development Agreement related to parking space calculation and a limitation on allowed uses, and

WHEREAS, the developer has presented the City with a proposed Amendment #2 to the Development Agreement including language for both changes and is attached hereto as Exhibit C; and

WHEREAS, the City Council finds it is in the public interest to approve Amendment #2 to the Development Agreement;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS:

Section 1. The findings set forth in the preamble of this Ordinance are incorporated by reference into the body of this Ordinance as if fully set forth herein.

Section 2. The City Council hereby approves Amendment #2 to the Development Agreement as attached hereto as Exhibit C. The Mayor is authorized to execute Amendment #2 on behalf of the City and to carry out all duties and obligations of the City pursuant to the Development Agreement as amended.

Section 3. To the extent Resolution No. 2007-170 and the previously approved Development Agreement and Amendment #1 thereto are inconsistent with this ordinance, they are repealed. The remaining portions are to remain in full force and effect.

Proposed

Section 4. This Ordinance shall take effect immediately upon passage and approval.

PASSED AND APPROVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS, THIS 15TH DAY OF NOVEMBER, 2022.

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

DEYELOPMENT AGREEMENT AMENDMENT #2

THIS IS AMENDMENT #2 to that certain development agreement (the "Agreement") dated the 11th day of September, 2007 by and among the City of Parker, Collin County, Texas, (the "City"), Bedell Family Limited Partnership, a Texas limited partnership ("Bedell"), Lewis Bend Partners, Ltd., a Texas limited partnership and Warner Capital, LLC, a Texas limited liability company (collectively, "Developer"). The land area subject of the Agreement is to be known as "Kings Crossing," the boundaries of which are set forth in the Agreement.

I.
RECITALS

A. Developer has requested certain modifications to the Agreement to reflect a change in the parking requirement for commercial uses.

B. Developer has also requested a modification to the Agreement in order to prohibit any Sexually Oriented Business uses.

NOW THEREFORE, in consideration of the covenants and conditions contained in the Agreement, and this Amendment, the parties agree to modify the Agreement as follows:

1. The third sentence under the subheading "Landscape Buffer & Screening" within the section regarding the "8 Acre 'Commercial' Tract 5" on **Exhibit C – Special Regulations** that describes the required parking ratio is deleted, and replaced with the following sentence:

   "Parking shall be provided at a ratio of one parking space per 300 square feet of air-conditioned space."

2. Under the subheading "Allowable Uses" within the section regarding the "8 Acre 'Commercial' Tract 5" on **Exhibit C – Special Regulations,** the following shall be added:

   "Sexually Oriented Businesses shall be specifically prohibited."

(Signature page follows)

DRAFT

This Agreement Amendment is effective on the date all parties have signed, which is the _____ day of _____, 2022

"BEDELL"
BEDELL FAMILY LIMITED PARTNERSHIP,
a Texas limited partnership

Bedell Investments, Inc.
Managing Partner

By:_____
Sandy L. Bedell
Vice-President

Date:_____

"DEVELOPER"
LEWIS BEND PARTNERS, LTD.,
a Texas limited partnership

By: Warner Land Advisors, L.P.,
a Texas limited partnership,
Its General Partner

Warner Capital, L.L.C.,
a Texas limited liability company,
General Partner

By: _____
Stephen L. Sallman
Its Manager

Date:_____

WARNER CAPITAL, L.L.C.,
a Texas limited liability company,
General Partner

By: _____
Stephen L. Sallman
Its Manager

Date:_____

DRAFT

"CITY"
City of Parker, Texas

By:_____
Lee Pettle
Mayor

Date:_____

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

DRAFT

STATE OF TEXAS §
§
COUNTY OF COLLIN §

This instrument was acknowledged before me on this _____ day of _____, 2022 by **Sandy Bedell**, for the purposes stated therein.

_____
Notary Public in and for the State of Texas

SEAL
My Commission Expires: _____

STATE OF TEXAS §
§
COUNTY OF COLLIN §

This instrument was acknowledged before me on this _____ day of _____, 2022 by **Stephen L Sallman**, for the purposes stated therein.

_____
Notary Public in and for the State of Texas

SEAL
My Commission Expires: _____

STATE OF TEXAS §
§
COUNTY OF COLLIN §

BEFORE ME, the undersigned authority, on this day personally appeared, **Lee Pettle**, known to me to be the **Mayor of the City of Parker**, whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same for the purposes and consideration therein expressed, on behalf of the City of Parker.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on this _____ day of _____, 2022.

_____
Notary Public in and for the State of Texas

SEAL
My Commission Expires: _____

DRAFT

DEVELOPMENT AGREEMENT

THIS DEVELOPMENT AGREEMENT (the "Agreement") is executed this 11 day of September, 2007, by and among the CITY OF PARKER, TEXAS, a municipal corporation existing under the laws of the State of Texas (the "City"), BEDELL FAMILY LIMITED PARTNERSHIP, a Texas limited partnership ("Bedell"), LEWIS BEND PARTNERS, LTD., a Texas limited partnership and WARNER CAPITAL, LLC, a Texas limited liability company (collectively, "Developer").

I
RECITALS

A. Developer owns certain land (Tract 4) and is the prospective purchaser of certain other land (Tracts 1, 2, 3 and 5) (the "Property") located in the extraterritorial jurisdiction ("ETJ") of the City of Parker, Collin County, Texas. The proposed development of the Property (the "Development") is more fully described in Exhibit "A" attached hereto and depicted on the conceptual plan attached as Exhibit "B" hereto.

B. Bedell is the record owner of Tracts 1, 2, 3 and 5 shown on the conceptual plan attached as Exhibit "B" ("Bedell's Tracts").

C. The Parties intend that the Property be developed in accordance with the mutually agreeable regulations provided in this Agreement.

D. The Parties intend that the Property will continue to exist within the City's ETJ and be immune from annexation by the City to the extent provided by law and by this Agreement.

E. The Parties desire that the Property be developed into a quality development and agree that securing the financing for the development of the Property requires an agreement providing for long-term certainty in regulatory requirements and development standards regarding the Property.

F. The Parties desire to obtain the benefits of certainty and predictability that can be provided by a development agreement.

G. The Parties have the authority to enter into this Agreement including, but not limited to, the authority granted by Sections 212.172 and 380 of the Texas Local Government Code.

NOW, THEREFORE, in consideration of the covenants and conditions contained in this Agreement, the Parties agree as follows:

II
ANNEXATION AND DEVELOPMENT

1. ***Agreement Not to Annex.*** The City agrees to not annex any portion of the Property until it receives a petition for annexation from Bedell or Developer as described in Paragraph 5 below. Bedell and/or Developer agree to file a petition for annexation for each tract of the Property as described in Paragraph 5 below.

2. ***Development Plan.*** Development of the Property shall be in accordance with the conceptual plan of development, which is incorporated herein by reference and attached hereto as Exhibit B (as the same may be modified from time to time by written agreement of the Developer and the City, the "Development Plan"). All development applications shall substantially comply with the Development Plan. Developer may make minor revisions to the Development Plan so long as the total number of single-family lots does not exceed 315. A development application (e.g. a preliminary plat application) must be filed with and approved by the City prior to development.

3. ***Regulations Applicable.*** The following regulations apply to development of the Property ("Governing Regulations"):

a. All regulations pertaining to the development of the Property set forth in this Agreement and all exhibits hereto (including the Development Plan);

b. The City's current subdivision ordinance; and

c. The special regulations set forth on Exhibit "C" ("Special Regulations").

4. ***Inconsistent Development.*** Developer agrees that any development application that is submitted to the City for any portion of the Property during the term of this Agreement that is substantially inconsistent with the Governing Regulations may be denied by the City.

5. ***Annexation and Zoning.*** Unless mutually agreed to by the parties, the annexation of any portion of the Property, should it occur, shall be undertaken only in accordance with a petition submitted by Bedell or Developer. The petition to annex Tract 4 must be submitted by Developer within ten (10) business days after North Texas Municipal Water District ("NTMWD") approval for the City to provide sanitary sewer service to the Property. Executed deed restriction instruments applying the Special Regulations to the Property must be tendered to the City with the petition to annex Tract 4. Petitions for the other tracts must be submitted for each phase of the Development within ten (10) business days after the final approval of a preliminary plat for said phase. Failure to file the annexation petition within ten (10) days after final approval of the preliminary plat shall void the approved preliminary plat. Upon such annexation, the City shall have all of the same enforcement rights to enforce compliance with the Governing Regulations with respect to the Property that it otherwise enjoys under the law to enforce development regulations within the City limits. Following annexation, the Parties contemplate that the City will zone the Property to a zoning district ("District") that is consistent with the Governing Regulations, and the City agrees, to the maximum extent permitted by law, to zone the Property to a district that is consistent with the Governing Regulations. The City may, in the event it does not have a zoning district compatible with the

Governing Regulations (e.g. "Retail"), annex the area, and not zone the area, relying instead on the enforcement of the Agreement and applicable deed restrictions. Regardless of the zoning of the Property after annexation, nothing herein shall be construed to prevent the Property from being developed in accordance with this Agreement. If the Property is zoned as contemplated by the Parties, the zoning shall be consistent with the Governing Regulations. Following annexation and zoning of any portion of the Property, any development of the annexed land shall thereafter be in accordance with this Agreement, unless the zoning of the Property is inconsistent with this Agreement, in which case Developer may, at its option, choose to develop in accordance with such zoning. No construction or development may take place on the Property which does not conform to this Agreement and the Governing Regulations without written agreement by the Developer, Bedell (if still the owner of the Property), and City.

2.0 WATER SYSTEM

2.1 Certificate of Convenience and Necessity ("CCN") – The City is the holder of a water CCN that includes the Property.

2.2 Water Service – The City hereby represents that sufficient water capacity and pressures shall be available to serve the Development on the same basis as other properties within the same service area as the development (Parker Lake Estates).

2.3 Master Plan – Proposed new major water infrastructure needed for the Development will be included on the City's Water System Master Plan. Water line improvements connecting the Property to the City's existing water line terminus ("Off-site Water Line") shall be constructed by Developer.

2.4 Cost-Sharing – The estimated engineering and construction costs for the Off-site Water Line is $87,400.00. Developer will be reimbursed for all of its actual costs for engineering and constructing the Off-site Water Line in accordance with Section 5; provided however, no reimbursement shall be made without the prior written approval of the City for the plans of construction and the contract price, which approval shall not unreasonably be withheld.

3.0 SANITARY SEWER

3.1 Sewer Service – The City agrees to use best efforts to enter into an agreement with NTMWD assuring sanitary sewer service will be provided to the Property. If NTMWD does not provide this assurance by October 15, 2007, this Development Agreement shall be deemed null and void and of no force or effect. The City hereby represents that sufficient sanitary sewer capacity and pressures shall be available to serve the Development on the same basis as other properties within the same service area as the development (Parker Lake Estates), subject to the Developer's plans for the construction being sufficiently engineered and installed to not burden the operation of the sewer system.

3.2 Sanitary Sewer Expansion and Extension – Developer will install a new lift station, force mains and gravity relief mains and connections necessary for providing sanitary

sewer service to the Property as well as providing relief to Parker Lake Estates Phase 3A and 3B ("Sanitary Sewer Expansion").

3.3 Master Plan – The proposed Sanitary Sewer Expansion will be included on the City's Wastewater System Master Plan.

3.4 Cost-Sharing – The estimated engineering and construction costs for the Sanitary Sewer Expansion is $492,800.00. Developer will be reimbursed for all of its actual costs for engineering and constructing the Sanitary Sewer Expansion in accordance with Section 5; provided however, no reimbursement shall be made without the prior written approval of the City for the plans of construction and the contract price, which approval shall not unreasonably be withheld.

4.0 ROADWAY SYSTEM

4.1 Lewis Lane – Developer will dedicate right of way and, unless installed by the County, improve Lewis Lane with a 2 inch asphalt overlay on the sections of Lewis Lane adjacent to the Property.

4.2 Lucas Road – Developer will dedicate right of way at the time of platting but will not be required to improve Lucas Road.

4.3 Interior Roadway Construction – On all interior roads in the subdivision, the City will allow Developer to dedicate 50 foot wide rights of way. The Developer shall dedicate drainage and utility easements if needed. If these easements are needed, then the width of these easements shall be no less than five feet (5') on each side of the right-of-way.

4.4 Cost-Sharing – The estimated engineering and construction costs for Lewis Lane are $109,000.00. Developer will be reimbursed for its actual costs for engineering and constructing Lewis Lane in accordance with Section 5; provided however, no reimbursement shall be made without the prior written approval of the City for the plans of construction and the contract price, which approval shall not unreasonably be withheld. The parties agree and acknowledge that it is anticipated that Collin County will improve Lewis Lane without the participation of the Developer or the City.

5.0 GENERAL

5.1 Reimbursement of Offsite Costs– The City agrees to reimburse Developer for its actual and approved costs for engineering and constructing the Sanitary Sewer Expansion, Lewis Lane and Off-site Water Line from City fees collected within the Development until full reimbursement at the rate of the actual cost of city fees and permits (including construction, water meter and sewer fees), not to exceed reimbursement of $7,000 per lot. Pro rata fees, if any, and abatement of Developer's platting and subdivision inspection fees shall also be credited against the Reimbursement Costs. All fees shall be charged to the party requesting the permit, and upon payment to the City, such payment shall be paid to the Developer on a quarterly basis. The City may specifically waive fees paid by the Developer and receive credit against the

Reimbursement Costs. The City and the Developer shall each maintain records of the costs and the credits taken against the costs.

The City shall collect prorata payments at the time any other developers of land not developed by Developer "tie in" to the Sanitary Sewer Expansion or Off-site Water Line and shall pay these collected amounts to Developer until full reimbursement of Developer costs.

5.2 Reimbursement Caps– Pursuant to Sections 2.4, 3.4 and 4.4, no reimbursements shall be made without prior City approval of the construction plans and contract price as described in those sections. The maximum reimbursement levels to the Developer are as follows: (a) Water System - $87,400.00; (b) Sanitary Sewer - $492,800.00; and (c) Lewis Lane - $109,000.00.

6.0 GENERAL

6.1 Inspection and Platting Fee Abatement – The City shall waive all platting and subdivision inspection permit fees associated with development of the Property by Developer until full reimbursement of the Sanitary Sewer Expansion, Lewis Lane and Off-site Water Line costs. All waived fees shall be credited against the approved Reimbursement Costs.

6.2 Condemnation – Developer shall be initially responsible for dedicating or acquiring any easements across privately owned land or sites (including off-site) which the City determines are necessary for the construction or operation of off-site infrastructure. The City agrees to secure right-of-ways or easements required for infrastructure (including franchise utilities) to serve the Development once Developer has exhausted all reasonable efforts to secure such rights-of-way or easements. The Developer shall share pro rata in the costs of off-site rights-of-way or easement acquisitions.

6.3 Early Plat Recording – Developer may record a final plat before the final public improvements are completed and accepted provided a performance bond or surety bond approved by the City is in place. The bond may be submitted for City approval, with the Developer's estimates of each unfinished item and its cost of completion (plus 20% contingency) upon completion of the roads, drainage ways, water and sewer lines. The bond shall include funds for the restoration and repair, if needed, of the drainage (bar) ditches as a result of any damage to the ditches caused by builder activity or utility construction.

6.4 Notice - Any notice to be given or to be served upon a party hereto in connection with this Agreement must be in writing and may be given by certified or registered mail and shall be deemed to have been given and received when a certified or registered letter containing such notice, properly addressed with postage prepaid, is deposited in the United States mail, and if given otherwise than by certified or registered mail, it shall be deemed to have been given and delivered to and received by the party (or such party's agent or representative) to whom it is addressed when actually received. Such notice shall be given to the parties hereto at the address set forth below. Any party hereto may, at any time by giving two (2) days written notice to the other parties, designate any other address in substitution of the foregoing address to which such notice shall be given.

If Notice to Owner:

Bedell Family Limited Partnership
c/o Jerry Bedell
2205 W. Lucas Road
Allen, Texas 75002

with a copy to:

John T. Helm, Esq.
P.O. Box 121
Allen, Texas 75013

If Notice to Developer:

Steve Sallman
4925 Greenville Avenue
Suite 1020
Dallas, Texas 75206

with a copy to:

Arthur J. Anderson
Winstead PC
5400 Renaissance Tower
1201 Elm Street
Dallas, Texas 75270-2199

If Notice to Parker:

City Administrator
City of Parker
5700 East Parker Road
Parker, Texas 75002

with a copy to:

James E. Shepherd
City Attorney
c/o The Shepherd Law Firm
1901 North Central Expressway
Suite 200
Richardson, TX 75080-3558

6.5 Defaults.

a. If a party is in default under this Agreement, the nondefaulting party must notify all parties in writing of an alleged failure by the defaulting party to comply with a provision of this Agreement, which notice must specify the alleged failure with reasonable particularity. The alleged defaulting party must, within 30 days after receipt of such notice or such longer period of time as may be specified in such notice, either cure such alleged failure or, in a written response, either present facts and arguments in refutation or excuse of such alleged failure or state that such alleged failure will be cured and set forth the method and time schedule for accomplishing such cure. Bedell shall have the right, but not the duty, to cure an alleged default by the Developer.

b. The nondefaulting party must determine (i) whether a failure to comply with a provision has occurred; (ii) whether such failure is excusable; and (iii) whether such failure has been cured or will be cured by the alleged defaulting party. The alleged defaulting party must make available, if requested, any records, documents or other information necessary to make the determination.

c. If the nondefaulting party determines that such failure has not occurred, or that such failure either has been or will be cured in a manner and in accordance with a schedule reasonably satisfactory to the nondefaulting party, or that such failure is excusable, such determination must conclude the investigation.

d. If the nondefaulting party determines that a failure to comply with a provision has occurred and that such failure is not excusable and has not been or will not be cured in a manner and in accordance with a scheduling reasonably satisfactory to the nondefaulting party, then the nondefaulting party may proceed to mediation.

e. In the event the parties to this Agreement cannot, within a reasonable time, resolve their dispute pursuant to the procedures described hereinabove, the parties agree to submit the disputed issue to non-binding mediation. All parties to this Agreement shall participate in this mediation. The parties must participate in good faith, but in no event must they be obligated to pursue mediation that does not resolve the issue within two days after the mediation is initiated or 14 days after mediation is requested. The parties participating in the mediation must share the costs of the mediation equally unless agreed otherwise by the parties.

f. In the event of a determination that the defaulting party has committed a material breach of this Agreement that is not resolved in mediation, the nondefaulting party may file suit in a court of competent jurisdiction in Collin County, Texas, and seek any relief available at law or in equity. Construction or development of the Property not in compliance with this Agreement is a material breach of this Agreement. Construction or development in accordance with all material requirements of a City-approved development application shall be presumed to be in compliance with this Agreement.

6.6 Miscellaneous:

a. Assignment of Agreement. Any assignment of this Agreement to an unaffiliated or unrelated entity of Developer requires approval of City and Bedell, which approval shall not unreasonably be withheld. A related or unrelated assignee under this subsection shall be subject to all of the Developer's obligations as set forth in this Agreement.

b. Venue. This Agreement shall be construed under and in accordance with the laws of the State of Texas and is specifically performable in Collin County, Texas. Exclusive venue shall be in state district court in Collin County, Texas.

c. Savings/Severability. In case any one or more provisions contained in this Agreement shall be for any reason held invalid, illegal or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not effect any other provision hereof, and it is the intention of the parties to this Agreement that in lieu of each provision that is found to be illegal, invalid or unenforceable, a provision be added to this Agreement which is legal, valid and enforceable and is as similar in terms as possible to the provision found to be illegal, invalid or unenforceable.

d. Authority. Each of the parties represents and warrants to the other that they have the full power and authority to enter into and fulfill the obligations of this Agreement.

e. Construction. All construction associated with the Development will be in accordance with applicable ordinances, regulations, development standards and standard details of the City in effect on the effective date of this Agreement.

f. Entire Agreement and Amendments. This Agreement contains the entire agreement of the parties with respect to the matters contained herein and may not be modified or terminated except upon the provisions hereof or by the mutual written agreement of the parties to this Agreement.

g. Consideration. This Agreement is executed by the parties hereto without coercion or duress and for substantial consideration as to the Developer and Bedell, and the sufficiency of which is forever confessed; and pursuant to § 212.172 of the TEX. LOC. GOV'T CODE as to the City.

h. Counterparts. This Agreement may be executed in a number of identical counterparts, each of which will be deemed an original for all purposes.

i. Representations. Each signatory represents this Agreement has been read by the party for which this Agreement is executed and that such party has had an opportunity to confer with its counsel.

j. Miscellaneous Drafting Provisions. This Agreement shall be deemed drafted equally by all parties hereto. The language of all parts of this Agreement shall be construed as a whole according to its fair meaning, and any presumption or principle that the language herein is to be construed against any party shall not apply. Headings in this Agreement are for the convenience of the parties and are not intended to be used in construing this document.

k. Time is of the Essence. Time is of the essence in this Agreement.

l. Reservation of Rights and Claims. This Agreement constitutes a "permit" (as defined in Chapter 245, Texas Local Government Code) that is deemed filed with the City on the Effective Date.

m. Recordation, Releases, and Estoppel.

(i) Recordation. Pursuant to the requirements of Section 212.172(c)(4) of the Texas Local Government Code, this Agreement, and all amendments to this Agreement, shall be recorded in the deed records of Collin County, Texas. This Agreement shall be binding upon: (1) the Property and, except as provided in this subsection, future owners of all or any portion of the Property ("Successors"); (2) the parties; (3) assignees; and (4) lenders. Notwithstanding the foregoing, however, this Agreement is not binding upon, and shall not constitute any encumbrance to title as to, any end-buyer of a fully developed and improved lot within the Property except for land use and development regulations that apply to specific lots. For purposes of this Agreement: (A) the term "end-buyer" means any owner, tenant, user, or occupant; (B) the term "fully developed and improved lot" means any lot, regardless of the use, for which a final plat has been approved by the City; and (C) the term "land use and development regulations that apply to specific lots" mean the Governing Regulations applied in accordance with this Agreement. A successor is not a party to this Agreement unless this Agreement is amended to add the successor as a party (which amendment shall be signed by the successor).

(ii) Releases. From time to time upon written request of Developer, any assignee, any lender, or any successor, the City staff shall execute, in recordable form, a release of this Agreement if the requirements of subsection (a) above have been satisfied (subject to the continued applicability of the applicable regulations in accordance with this Agreement). In addition, the City Administrator shall have the authority (but not the obligation) from time to time, to execute further releases of this Agreement with respect to specific tracts of land within the

Property, if, in the sole discretion of the City Administrator, such releases are in the best interest of the City.

(iii) Estoppel. From time to time upon written request of Developer, any assignee, any lender, or any successor, the City staff shall execute a written estoppel certificate to the person or entity making the request: (1) describing, in detail, the status (e.g., unperformed, partially performed, or fully performed) of any material obligation that is identified in the request; (2) identifying any material obligations that are in default or which, with the giving of notice or passage of time, would be in default; and (3) stating that, except as otherwise identified, and to the extent true, that to the best knowledge and belief of the City, the parties are in substantial compliance with their material obligations under this Agreement.

n. Termination. In the event this Agreement is terminated as provided in this Agreement or is terminated pursuant to other provisions, or is terminated by mutual agreement of the parties, the parties must promptly execute and file of record, in the Official Public Records of Real Property of Collin County, Texas, a document confirming the termination of this Agreement, and such other documents as may be appropriate to reflect the basis upon which such termination occurred.

o. Binding Effect. This Agreement will be binding upon and inure to the benefit of the parties hereto and their respective heirs, executors, administrators, legal representatives, successors and authorized assigns. This Agreement only inures to the benefit of, and may only be enforced by, the parties, assignees, lenders, successors, and the City. No other person or entity is a third-party beneficiary of this Agreement.

p. Authority. The City represents and warrants that this Agreement has been approved by the City Council of the City in accordance with all applicable public meeting and public notice requirements (including, but not limited to, notices required by the Texas Open Meetings Act) and that the individual executing this Agreement on behalf of the City has been authorized to do so. Developer represents and warrants that this Agreement has been approved by appropriate action of Developer and that the individual executing this Agreement on behalf of Developer has been authorized to do so. Each assignee, lender, or successor who becomes a party to this Agreement represents and warrants that this Agreement has been approved by appropriate action of such assignee, lender, or successor and that the individual executing this Agreement on behalf of such assignee, lender, or successor has been authorized to do so.

6.7 Governmental Powers; Waivers of Immunity – By its execution of this Agreement, the City does not waive or surrender any of its governmental powers, immunities, or rights except as follows:

a. The City waives its governmental immunity from suit and immunity from liability solely as to any action brought by a party to pursue the remedies available under this Agreement, and only to the extent necessary to pursue such remedies. Nothing in this section shall waive any claims, defenses or immunities that the City has with respect to suits against the City by persons or entities other than a party to this Agreement.

b. Nothing in this Agreement is intended to delegate or impair the performance by the City of its governmental functions.

6.8 Effective Date - The effective date of this Development Agreement shall be the date on which this Agreement is approved by the City Council of the City.

EXECUTED as of the date first above written.

BEDELL FAMILY LIMITED PARTNERSHIP,
a Texas limited partnership

By: Bedell Investments, Inc.,
Its: Managing Partner

By: Walter G Bedell
Walter G. Bedell

Its: President

Date: 9-4-07

LEWIS BEND PARTNERS, LTD.,

a Texas limited partnership

By: Warner Land Advisors, L.P.,
a Texas limited partnership,
Its: General Partner

By: Warner Capital, L.L.C.,

A Texas limited liability company,

General Partner

By: Stephen L. Sallman, Mgr.

Stephen L. Sallman

Its: Manager

Date: 9/6/07

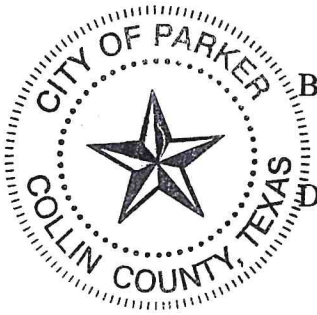
WARNER CAPITAL, LLC,
a Texas limited liability company

By: Stephen L. Sallman, Mgr.
Stephen L. Sallman

Its: ~~President~~ manager

Date: 9/6/07

CITY OF PARKER, TEXAS



By: _____
Jerry Tartaglino, Mayor

Date: September 11, 2007

STATE OF TEXAS)
)
COUNTY OF Collin)

This instrument was acknowledged before me on the 27th day of September, 2007, by **WALTER G. BEDELL**, President of Bedell Investments, Inc., Managing Partner of Bedell Family Limited Partnership, a Texas limited partnership.

[Seal]

TAMMY W. HOGGATT
Notary Public
State of Texas
My Comm. Expires 04-05-09

Notary Public--State of Texas

STATE OF TEXAS)
)
COUNTY OF Dallas)

This instrument was acknowledged before me on the 6th day of September, 2007, by **STEPHEN L. SALLMAN**, Manager of Warner Capital, L.L.C., a Texas limited liability company, General Partner of Warner Land Advisors, L.P., a Texas limited partnership, General Partner of Lewis Bend Partners, Ltd., a Texas limited partnership.

[Seal]

Notary Public--State of Texas

TAMARA J. MIGUEZ
MY COMMISSION EXPIRES
July 15, 2010

STATE OF TEXAS)
)
COUNTY OF Dallas)

This instrument was acknowledged before me on the 6th day of September, 2007, by **STEPHEN L. SALLMAN**, President of Warner Capital, L.L.C., a Texas limited liability company.

[Seal]

Notary Public--State of Texas

TAMARA J. MIGUEZ
MY COMMISSION EXPIRES
July 15, 2010

STATE OF TEXAS)
)
COUNTY OF COLLIN)

This instrument was acknowledged before me on the 11th day of September, 2007, by **JERRY TARTAGLINO**, Mayor of the City of Parker, Texas.

[Seal]

CARRIE LYNN SMITH
Notary Public, State of Texas
My Commission Expires
December 08, 2010

Carrie L. Smith
Notary Public--State of Texas

EXHIBIT "A"

Legal Description

EXHIBIT "A"

TRACT 1, 2, 3 & 5

BEING a tract of land situated in the ANN HURT SURVEY, ABSTRACT NO. 428 and the A.J. TUCKER SURVEY, ABSTRACT NO. 910, in Collin County, Texas, and being all of a called 356 acre tract of land described as Tract 1 in a deed from Irene H. Bedell to Bedell Family Limited Partnership recorded in Volume 4670, Page 1295 of the Deed Records of Collin County, Texas, and being more particularly described as follows:

BEGINNING at a 1/2-inch iron rod found at a re-entrant corner in the West line of said 356 acre tract, said point also being the Northeast corner of Parker Lake Estates, Phase 3-A, an addition to Collin County according to the plat thereof recorded in Cabinet N, Page 806 of the Plat Records of Collin County, Texas;

THENCE along the westerly boundary of said 356 acre tract the following:

North 89 degrees 58 minutes 08 seconds West, along the North line of said Parker Lake Estates, Phase 3-A, a distance of 538.99 feet to a 1/2-inch iron rod set in concrete found for the Southeast corner of Parker Lake Estates, Phase 1, an addition to Collin County according to the plat thereof recorded in Cabinet M, Page 202 of the Plat Records of Collin County, Texas;

North 00 degrees 23 minutes 37 seconds West, along the East lines of said Parker Lake Estates, Phase 1, and Parker Lake Estates, Phase 2, an addition to Collin County, Texas, according to the plat thereof recorded in Cabinet N, Page 808 of said Plat Records, a distance of 1,652.66 feet to a 1/2-inch iron rod found for corner;

North 89 degrees 17 minutes 03 seconds East, continuing along the easterly boundary of said Parker Lake Estates, Phase 2, a distance of 538.43 feet to a 2-inch iron pipe found for corner;

North 00 degrees 18 minutes 01 second West, along the most northerly East line of said Parker Lake Estates, Phase 2, a distance of 1,193.20 feet to a P.K. nail set in the approximate centerline of W Lucas Road (C.R. 263 - undedicated public road);

THENCE South 89 degrees 49 minutes 08 seconds East, along the approximate center line of said W. Lucas Road, a distance of 2,970.00 feet to a P.K. nail set for the Northeast corner of said 356 acre tract;

THENCE South 00 degrees 08 minutes 59 seconds East, a distance of 2,303.71 feet to a 5/8-inch iron rod with cap marked "PETITT-RPLS 4087" set for corner;

THENCE South 89 degrees 51 minutes 01 second West, a distance of 495.00 feet to a 5/8-inch iron rod with cap marked "PETITT-RPLS 4087" set for corner;

THENCE South 00 degrees 08 minutes 59 seconds East, a distance of 363.00 feet to a 5/8-inch iron rod with cap marked "PETITT - RPLS 4087" set for corner,

THENCE North 89 degrees 51 minutes 01 second East, a distance of 165.00 feet to a 5/8-inch iron rod with cap marked "PETITT - RPLS 4087" set for corner;

EXHIBIT "A"- CONTINUED

THENCE South 00 degrees 37 minutes 59 seconds East, a distance of 2,617.79 feet to a 5/8-inch iron rod with cap marked "PETITT-RPLS 4087" set on the North line of a called 13.75 acre tract of land described as Tract F in a deed to Young Dean Homestead, Ltd., recorded in Volume 5167, Page 3443 of said Deed Records,

THENCE South 89 degrees 33 minutes 57 seconds West, along the North line of said Tract F and the North line of a called 49.35 acre tract of land described as Tract C in said Young Dean deed, a distance of 2,640.00 feet to a 5/8-inch iron rod with cap marked "PETITT-RPLS 4087" set on the East line of Parker Lake Estates, Phase 3-B, an addition to Collin County according to the plat thereof recorded in Cabinet P, Page 936 of said Plat Records,

THENCE North 00 degrees 24 minutes 46 seconds West, along the East lines of said Parker Lake Estates, Phase 3-B, and Parker Lake Estates, Phase 2, a distance of 2,461.83 feet to the POINT OF BEGINNING and containing 15,561,230 square feet, or 357.237 acres of land, more or less.

AND

BEING a tract of land situated in the ANN HURT SURVEY, ABSTRACT NO. 428, in Collin County, Texas, and being all of a called 1 acre tract described as Tract 2 in a deed from Irene H. Bedell to Bedell Family Limited Partnership recorded in Volume 4670, Page 1295 of the Deed Records of Collin County, Texas, and being more particularly described as follows:

COMMENCING at a ½-inch iron rod found at a re-entrant corner in the west line of a called 356 acre tract described as Tract 1 in said Bedell deed, said point also being the northeast corner of Parker Lake Estates, Phase 3-A, an addition to Collin County according to the plat thereof recorded in Cabinet N, Page 806 of the Plat Records of Collin County, Texas; thence South 00 degrees 24 minutes 46 seconds East , along the east line of said Parker Lake Estates, Phase 3-A, and the east line of Parker Lake Estates 3-B, an addition to Collin County, Texas, according to the plat thereof recorded in Cabinet P, Page 936 of said Plat Records, a distance of 2475.00 feet to the northwest corner of a called 49.35 acre tract of land described as Tract C in a deed to Young Dean Homestead, Ltd., recorded in Volume 5167, Page 3443 of said Deed Records; thence North 89 degrees 22 minutes 41 seconds East, along the north line of said 49.35 acre tract and the north line of a called 13.75 acre tract of land described as Tract F in said Young Dean deed, a distance of 2640. Feet; thence North 00 degrees 45 minutes 08 seconds West, a distance of 2616.07 feet to a 5/8-inch iron rod with cap marked "PETITT – RPLS 4087" set for the southeast corner of said Tract 2 and the POINT OF BEGINNING;

THENCE South 89 degrees 51 minutes 01 second West, a distance of 165.00 feet to 5/8-inch rod with cap marked "PETITT-RPLS 4087" set for corner;

THENCE North 00 degrees 08 minutes 59 seconds West, a distance of 363.00 feet to a 5/8-inch iron rod with cap marked"PETITT – RPLS 4087" set for corner;

THENCE North 89 degrees 51 minutes 01 seconds East, a distance of 161.94 feet to a 5/8-inch rod with cap marked "PETITT – RPLS 4087" set for corner;

THENCE South 00 degrees 37 minutes 59 seconds East, a distance of 363.01 feet to the POINT OF BEGINNING and containing 56,339 square feet, or 1.362 acres of land, more or less.

EXHIBIT "A" - CONTINUED

TRACT 4

4856sur

BEING a tract of land situated in the Ann S. Hurt Survey, Abstract no. 428, City Of Parker, Collin County, Texas, the subject tract being a portion of that tract of land conveyed to Rudine C. Newman, Trustee, or her successors in trust, of the NEWMAN LIVING TRUST, according to the Warranty Deed recorded in County Clerk file number 2004-0003770 of the Land Records of Collin County, Texas (LRCCT), the subject tract further being all of that one acre tract conveyed to John Braley and wife, Christine Newman Braley and described as TRACT NO. 1 according to the deed recorded in Volume 639, Page 436 (LRCCT), the subject tract being more particularly described as follows;

BEGINNING at the southwest corner of said Newman Living Trust tract and the southeast corner of a tract of land conveyed to the Bedell Family Limited Partnership, according to the Warranty Deed recorded in County Clerk file number 2000-0050958 (LRCCT), said Beginning point further being on the south line of said Ann S. Hurt Survey and near an ell curve of Lewis Lane, a public Right-of-Way with no dedication found, a 1/2" iron pin with a red cap stamped Tipton Engineering, Inc. set at corner, from which a 1/2" iron pin with a cap stamped Petitt #4087 found bears S 88° 42' 14" W, a distance of 7.78 feet and a power pole bears S 65° 58' 51" E – 39.70 feet;

THENCE, North, along the west line of said Newman Living Trust tract and the east line of said Bedell Family Limited Partnership tract, and easterly of the asphalt pavement in said Lewis Lane, a distance of 1458.18 feet to a point on the south line of that 1.00 acre tract of land conveyed to Rodney S. Warne and Betsy L. Warne according to the General Warranty Deed recorded on County Clerk file number 2001-0102937 (LRCCT), 1/2" iron pin with a red cap stamped Tipton Engineering, Inc. set at corner;

THENCE, N 89° 57' 48" E, along the south line of said Rodney S. Warne and Betsy L. Warne tract, and a north line of said NEWMAN LIVING TRUST tract, passing over a 1/2" iron pin with a cap stamped "Gere 4117" at a distance of 10.64 feet, passing another 1/2" iron pin with a cap stamped "Gere 4117" at a distance of 189.34 feet, and continuing to make a total distance of 397.99 feet to a 1/2" iron pin with a cap stamped "Gere 4117" found at corner;

THENCE, N 00° 46' 29' W, a distance of 208.66 feet to a point on the north line of said Newman Living Trust tract and the south line of a tract of land conveyed to John P. Taddiken and Mary B. Taddiken according to the Warranty Deed recorded in County Clerk file number 2002-0092125 (LRCCT), 1/2" iron pin with a cap stamped "Gere 4117" found at corner, from which the southwest corner of the said John P. Taddiken tract bears S 89° 56' 34" W – 372.38 feet;

THENCE, N 89° 56' 34" E, along said Newman Living Trust tract north line and the John P. Taddiken tract south line, a distance of 613.21 feet to the most easterly corner of said John P. Taddiken tract and an angle point of the Amended Final Plat of Estates of

EXHIBIT "A" - CONTINUED

Austin Trail Phase 1, an addition to the City Of Lucas recorded in Cabinet N, Page 709 (LRCCT), a 5/8" iron pin with a cap stamped "Bury + Partners" found at corner;

THENCE, S 89° 49' 12" E, continuing along said Newman Living Trust tract north line and along a south addition line of said Amended Final Plat of Estates of Austin Trail Phase 1, and south addition line of Lots 14R & 15R of Block D of Estates At Austin Trail Phase 1, an addition to the City Of Lucas recorded in Cabinet P, Page 192 (LRCCT), a distance of 311.63 feet to a 5/8" iron pin found at corner;

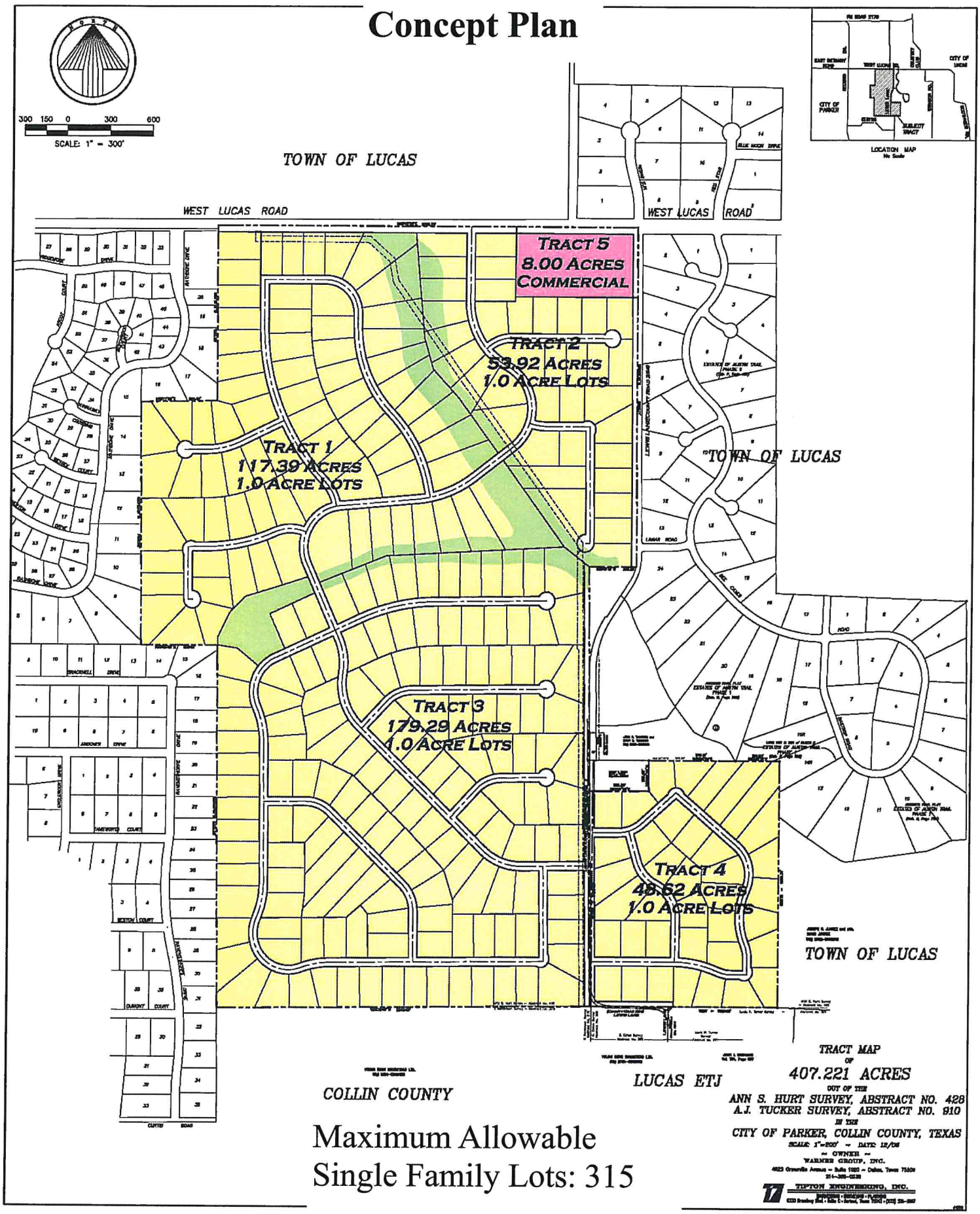
THENCE, South, along the east line of said Newman Living Trust tract, and continuing along a westerly line of said Amended Final Plat of Estates of Austin Trail Phase 1, and a westerly line of Lots 14R & 15R of Block D of Estates At Austin Trail Phase 1 part of the way, then along the westerly line of a tract of land conveyed to Joseph C. Juarez and wife, Diane Juarez according to the Warranty Deed recorded in County Clerk file number 2002-0108933, passing at 208.90 feet, a 5/8" iron pin with a cap stamped "Bury + Partners" found, passing 0.41 west of a 5/8" iron pin found at 1035.01 feet and continuing to make a distance of 1666.71 feet to the southeast corner of said Newman Living Trust tract, a 5/8" iron pin found at corner, from which one 60d-nail found bears S 87° 43' 10" E-112.82 feet and another 60d-nail found bears S 87° 44' 54" E – 120.17 feet;

THENCE, West, along the south line of said Newman Living Trust tract and a south line of a tract of land conveyed to the previously mentioned John Braley and wife Christine Newman Braley, said line further being on the north line of a tract of land owned by John L. Morrison according to the Last Will And Testament recorded in Volume 761, Page 57 (LRCCT) and on the north line of a 13.75 acre described tract of land conveyed to Young Dean Homestead Ltd. according to the Warranty Deed recorded on County Clerk file number 2002-0068655 (LRCCT), passing 1.42 feet south of a 1/2" iron pin with a yellow cap (stamp not legible) at a distance of 777.34 feet and continuing to make a total distance of 1320.00 feet to the Place Of Beginning with the subject tract containing 2,117,986 Square Feet or 48.6223 Acres of Land.

EXHIBIT "B"

Conceptual Plan

Concept Plan



Maximum Allowable
Single Family Lots: 315

EXHIBIT "C"

Special Regulations

- 8 Acre "Commercial" Tract 5
  - Allowable Uses
    - Antique Shop
    - Art Gallery
    - Bakery
    - Bank or financial institution
    - Barber or beauty salon
    - Book, card or stationary store
    - Camera and photographic supply shop
    - Catering service
    - Church
    - Clothing or apparel store
    - Coffee Shop
    - Construction field office
    - Convenience store (without gas station)
    - Drugstore or Pharmacy
    - Fabric store
    - Florist
    - Furniture, home furnishings and appliance store
    - Jewelry Store
    - Mailing services
    - Musical instrument sales and repair
    - Office
    - Office furniture, equipment and supply store
    - Parking lot-accessory
    - Photography or art studio
    - Public building
    - Repair shop-personal items
    - Restaurant without drive thru or curb service
    - School
    - Sporting goods store
    - Tailor shop
    - Toy or hobby shop
    - Video rental Store

  - Building regulations
    - Type of materials - Masonry-90% brick, stone or stucco on total elevation, exclusive of windows, doors, gables and trim.
    - Building style – Residential style with a roof pitch of at least 6/12 on all elevations except that a 4/12 pitch is allowed on all elevations with a tile roof (similar to residential style shown in Exhibit "D").

- The City shall have landscaping, site plan and architectural review in order to ensure residential style construction.
- Height - No building or structure shall exceed two stories or 40' maximum height. Height limited to one story not to exceed 35' when located within 150' of a residence. Cupolas and special architectural elements excluded from height limitations.
- Front setback - 50' (or 25' if no parking provided in the setback area and the entire setback is developed as landscaping).
- Side Setbacks - 25' (or 50' if adjacent to residential).
- Rear Setbacks - 30' (or 60' if adjacent to residential).

- Landscape Buffer and Screening
  - A 30' landscape buffer shall be located in the first 30' setback area of the commercial tract.
  - 15% of the area between the main building face and the front property line shall be of a permeable landscaped surface.
  - Parking shall be provided at a ratio of one parking space per 200 square feet of occupied space.
  - Wrought iron and/or tubular steel fencing and permanent evergreen landscape screening consisting of berms (minimum 3' in height), bushes and trees shall be installed on all sides adjacent to residential areas. A berm to be installed on the eastern boundary of the Commercial Tract on either the east or west side of Lewis Lane.

- Residential Tracts 1, 2, 3, and 4
  - Uses-
    - Single Family Residential and accessory uses – no accessory dwellings which are not built as a part of the principal dwelling structure, or as a portion of a detached garage are allowed.
  - Building Regulations
    - Lot Sizes = Minimum Lot Size One Acre
    - Average Lot Size = 1.27 acres gross (over entire development area – not per addition) / 1.0 acre average net
    - Setbacks - Front Setbacks = 50', Side Setbacks 25', Rear Setbacks = 30', Corner Setbacks = 50'
    - Overlength Cul-de-sacs - Cul-de-sacs may be up to 1,500 linear feet in length. Waterline looping may be required by the City for lines in cul-de-sacs of over 750 feet.

  - Building Materials
    - First Floor Elevation-90% brick, stucco or stone, exclusive of windows, doors, gables and trim.
    - Total Elevation-75% brick, stucco or stone, exclusive of windows, doors, gables and trim.
  - Minimum Living Space
    - Tracts 2 and 3 – Min. 2,750 square feet (air conditioned space) on all

lots except lots adjacent to Commercial Tract which may be a minimum of 2,500 square feet (air conditioned space).

- Tracts 1 and 4 – Min. 3,000 square feet (air conditioned space) on all lots.

- Outbuildings – Not to exceed 50% of the first floor air conditioned space of the primary residence. Must comply with "Building Materials" requirement(s). Must be located behind the primary residence on the lot.
- Fencing – per City of Parker ordinances.
- Unless addressed hereinabove, development on Tracts 1-4 must comply with the City's SFT zoning district in effect on September 1, 2007.

EXHIBIT "D"

Elevation Examples

Dallas_1\4909475\9



BUILDING 2



BUILDING 1

DEVELOPMENT AGREEMENT AMENDMENT #1

THIS IS AMENDMENT #1 to that certain development agreement (the "Agreement") dated the 11th day of September, 2007 by and among the City of Parker, Collin County, Texas, (the "City"), Bedell Family Limited Partnership, a Texas limited partnership ("Bedell"), Lewis Bend Partners, Ltd., a Texas limited partnership and Warner Capital, LLC, a Texas limited liability company (collectively, "Developer"). The land area subject of the Agreement is to be known as "Kings Crossing", the boundaries of which are set forth in the Agreement.

I.
RECITALS

A. Developer has requested certain modifications to the Agreement to reflect the change in the need to remove reimbursement provisions for the renovation of Lewis Lane, and the corresponding need to increase funds for additional expenses to be incurred for offsite water lines, and on and offsite sewer lines.

B. An additional sewer force main not contemplated in the original Agreement has been identified as a need for the development.

NOW THEREFORE, in consideration of the covenants and conditions contained in the Agreement, and this Amendment, the parties agree to modify the Agreement as follows:

1. The last sentence of paragraph 5.2 of the Agreement is deleted, and replaced with the following sentence:

   "The maximum total reimbursement paid to the Developer for the combined reimbursement costs of the water system and sanitary sewer expansion shall not exceed the actual approved costs for those projects, and in no event shall exceed the sum of $689,200.00."

2. Section 5 of the Agreement is hereby amended by adding the following new paragraph 5.3:

   "**5.3 Reimbursement of Developer's Costs** – The reimbursement of Developer's costs from fees collected within the development is limited to $7,000 per lot in Paragraph 5.1. The disbursements will be paid or retained as follows:

   (1) The reimbursement funds collected by the City for each phase of the Development will be held by the City and paid quarterly to the Developer, subject to the following:

a. No material claim has been made by the City with regard to the water, sewer, drainage, or road improvements subject to reimbursement under the Development Agreement which has not been resolved, or which is not insured by the maintenance bonds provided in accordance with the subdivision regulations.

b. No material dispute and/or litigation is pending by and between the City and the Developer regarding any matter subject of this Development Agreement.

(2) In the event a. and/or b. above has occurred, the City may retain the funds which would otherwise have been paid to the Developer, but only to the extent reasonable to pay the estimated costs to cure the default or dispute. The funds may be retained by the City until the default is cured in accordance with paragraph 6.5 of the Development Agreement at which time the funds will be released.

5.3.1 The City of Lucas and Collin County have improved Lewis Lane. The original $109,000 allocated in the Agreement incentives for the Developer will not be expended for that purpose. Any improvements required of the Developer by the City subdivision regulations, including any required improvements to Lewis Lane, will not be reimbursed.

5.3.2 No interest shall accrue to the Developer on any retained amount while held by the City."

(Signature page follows)

This Agreement Amendment is effective on the date all parties have signed, which is the 21st day of January, ~~2013.~~ 2014

"BEDELL"
BEDELL FAMILY LIMITED PARTNERSHIP,
a Texas limited partnership

By: Bedell Investments, Inc.,
Its Managing Partner

By: Walter G Bedell
Walter G. Bedell
Its President

Date: 1/21/14

"DEVELOPER"
LEWIS BEND PARTNERS, LTD.,
a Texas limited partnership

By: Warner Land Advisors, L.P.,
a Texas limited partnership,
Its General Partner

By: Warner Capital, L.L.C.,
a Texas limited liability company,
General Partner

By: Stephen L Sallman Mgr.
Stephen L. Sallman
Its Manager

Date: 1/15/14

WARNER CAPITAL, LLC,
a Texas limited liability company

By: Stephen L Sallman Mgr
Stephen L. Sallman
Its Manager

Date: 1/15/14

"City"
City of Parker, Texas

By: _____
Z Marshall, Mayor

Date: January 21, 2014

STATE OF TEXAS §
§
COUNTY OF ~~COLLIN~~ Dallas §

This instrument was acknowledged before me on the 21st day of Jan., 2014, by Walter G. Bedell, for the purposes stated therein.

TAMARA J MIGUEZ
My Commission Expires
July 29, 2014

Tamara Miguez
Notary Public, State of Texas

My Commission Expires:_____

STATE OF TEXAS §
§
COUNTY OF ~~COLLIN~~ Dallas §

This instrument was acknowledged before me on the 15th day of Jan., 2014, by Stephen L. Sallman, for the purposes stated therein.

Tamara Miguez
Notary Public, State of Texas

My Commission Expires: 7-29-2014

TAMARA J MIGUEZ
My Commission Expires
July 29, 2014

STATE OF TEXAS §
§
COUNTY OF COLLIN §

BEFORE ME, the undersigned authority, on this day personally appeared Z Marshall, known to me to be the Mayor of the City of Parker, whose name is subscribed to the foregoing instrument, and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed, on behalf of the City of Parker.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on this 21st day of January, 2014.

Carrie L. Smith
Notary Public, State of Texas

My Commission Expires: 1/27/2015

CARRIE L. SMITH
Notary Public, State of Texas
My Commission Expires
January 27, 2015



Filed and Recorded
Official Public Records
Stacey Kemp, County Clerk
Collin County, TEXAS
01/22/2014 04:06:37 PM
$42.00 DLAIRD
20140122000063210





Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	November 10, 2022
Exhibits:		

AGENDA SUBJECT

DISCUSSION AND/OR APPROVAL OF FUNDING FOR PARKS & RECREATION HOLIDAZE LIGHTS EVENT.

SUMMARY

Council will discuss the potential allocation of funding for the Holidaze Lights Event being coordinated by the Parks and Recreation Commission.

If a budget amendment is required following council approval of funding, it will be presented to Council at the next regular meeting.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	City Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	October 23, 2022
Exhibits:	1. Proposed Resolution 2. Resolution No. 2021-682 and Resolution No. 2020-652 3. Application(s) – 1 - (Email to Mayor/City Council only) ○ Lucy Estabrook 4. Attendance Record	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-719, MAKING APPOINTMENTS TO THE PLANNING AND ZONING (P&Z) COMMISSION.

SUMMARY

The following Planning and Zoning (P&Z) Commissioners, whose term(s) expire November 30th, expressed a desire to continue to serve on the P&Z in their current positions:

Member	Position	Term Expiration
Joe Lozano	Place Two; Vice Chairperson	Nov. 30
Dave Leamy *	Place Four	Nov. 30

P&Z Chair Wright said he has no concerns with current members; therefore, recommends no changes at this time. He understands any and all appointments are at the pleasure of the Council.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

RESOLUTION NO. 2022-719
(2022 P&Z Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS TO SERVE ON THE PLANNING AND ZONING COMMISSION.

WHEREAS, Members of the Planning and Zoning Commission serve in staggered two-year terms, commencing on December 1st and ending on November 30th, as set forth in Section 150.02(A) of the City of Parker Code of Ordinances, and

WHEREAS, Alternative Members of the Planning and Zoning Commission serve one-year terms unless specifically appointed for a two-year term at the time of appointment, commencing on December 1st and ending on November 30th, as set forth in Section 150.02(B) of the City of Parker Code of Ordinances; and

WHEREAS, Section 150.02(B) specifies that there may be up to three Alternate members and Council appointed all three Alternate Members on November 16, 2021, via Resolution 2021-682, for two-year terms ending November 30, 2023, so there is no current vacancy of Alternate Members;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS:

Section 1. **Appointment of Voting Members with terms expiring November 30, 2024**

The following people are hereby appointed to serve on the Planning and Zoning Commission as voting Members for the two-year term, beginning December 1, 2022 and expiring November 30, 2024:

Place 2 _____
Place 4 _____.

Section 2. **Appointment of Officers**

Following installation of the newly appointed Members, Council will appoint Officers of the Planning and Zoning Commission at a future council meeting, pursuant to Section 150.02(C) of the City of Parker Code of Ordinances.

Section 3. **Effective Date**

This Resolution shall take effect immediately upon passage and approval.

Proposed

PASSED AND APPROVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS, THIS 15TH DAY OF NOVEMBER, 2022.

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

RESOLUTION NO. 2021-682
(2021-2023 P&Z Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS AND ALTERNATE MEMBERS TO SERVE ON THE PLANNING AND ZONING COMMISSION

WHEREAS; Members and Alternates of the Planning and Zoning serve in staggered two-year terms, commencing on December 1st and ending on November 30th, as set forth below:

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2023:

The following will continue to serve their unexpired term(s) through November 30, 2021, and are hereby appointed to serve on the Planning and Zoning Commission as voting members for additional two year terms, beginning December 1, 2021 and expiring November 30 of 2023.

Place 1	Russell Wright
Place 3	Wei Wei Jeang
Place 5	Jasmat Sutaria

SECTION 2. Alternate Members with terms expiring November 30, 2023

The following will continue to serve their unexpired term(s) through November 30, 2021, and are hereby appointed to serve on the Planning and Zoning Commission as Alternate Members for additional two-year terms, beginning December 1, 2021 and expiring November 30, 2023.

Alternate 1	Larkin Crutcher
Alternate 2	JR Douglas
Alternate 3	Todd Fecht

SECTION 4. Appointment of Officers

The officers of the Planning and Zoning Commission shall include a Chairperson, Vice-chairperson, and Secretary will continue serve their unexpired term(s) and will continue for the term of two-years, expiring on the same date as the member's term, unless otherwise designated by council.

Chairperson	Russell Wright
Vice Chairperson	Joe Lozano
Secretary	Wei Wei Jeang

SECTION 5. Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the __16th__ day of __November__, 2021.

CITY OF PARKER:

Lee Pettle, Mayor

ATTESTED:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Scott D. Levine, Interim City Attorney

RESOLUTION NO. 2020-652
(2020 Planning and Zoning Commission Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS TO SERVE ON THE PLANNING AND ZONING COMMISSION

WHEREAS, Members and Alternate members of the Planning and Zoning Commission serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth below:

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Planning and Zoning Commission as voting members for the remainder of a two-year term, expiring November 30, 2022 or until their successors are appointed and qualified.

Place 2	Joe Lozano
Place 4	David Leamy

SECTION 2. Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 17th day of November, 2020.

CITY OF PARKER COLLIN COUNTY, TEXAS

APPROVED:

Lee Pettle, Mayor

ATTEST:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Brandon Shelby, City Attorney

Planning and Zoning 2022 Attendance

2022 Res. No. 2021-682			1 Chairman Russell Wright	2 Vice Chair Joe Lozano	3 Secretary Wei Wei Jeang	4 David Leamy	5 Jasmat Sutaria	Alternate 1 Larkin Crutcher	Alternate 2 JR Douglas	Alternate 3 Todd Fecht
	✓	Absent								
2022										
Jan	13	Joint - Code								
	27	Canceled								
Feb	10	Canceled								
	24	Canceled								
Mar	3	Special	✓	✓	✓	✓	✓	✓	Absent	Absent
	10	Regular	✓	✓	✓	✓	Absent	Absent	✓	✓
	24	Canceled								
Apr	14	Canceled								
	28	Canceled								
May	12	Canceled								
	26	Canceled								
Jun	9	Regular	✓	Absent	✓	Absent	Absent	✓	Absent	✓
	23	Canceled								
Jul	14	Canceled								
	28	Canceled								
Aug	11	Canceled								
	25	Regular	✓	✓	✓	Absent	✓	✓	Absent	Absent
Sept	8	Canceled								
	22	Canceled								
Oct	13	Canceled								
	27	Canceled								
Nov	10	T/Regula								
	24	Canceled r								
Dec	8	T/Regular								
	22	Canceled								
2022 Absences			0	1	0	2	2	1	3	2

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	City Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	November 9, 2022

Exhibits:

1. **Proposed Resolution**
2. **Resolution No. 2021-683 and Resolution No. 2020-653**
3. **Alternate 1 Jason Shepard's resignation (email) and Alternate 2 was not filled 2021-2022 Term**
4. **Application(s) – 1 - (Email to Mayor/City Council only)**
   - **Lucy Estabrook**
5. **Attendance Record**

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-720 MAKING APPOINTMENTS TO THE ZONING BOARD OF ADJUSTMENT (ZBA)..

SUMMARY

The following Zoning Board of Adjustment (ZBA), whose term(s) expire November 30th, expressed a desire to continue to serve on ZBA in their current positions:

Member	Position	Term Expiration	
Randy Kercho	Place Two (2)	Nov. 30	
Don Dickson	Place Four (4)	Nov. 30	
Jason Shepard	Alternate One (1)	Nov. 30	Resignation*
Vacant	Alternate Two (2)	Nov. 30	

*Jason Shepard resigned. See resignation email in exhibits above.

ZBA Chair Ellison said he has no concerns with current members; therefore, recommends no changes in current members at this time and would welcome two new appointees for the positions Alternate One and Alternate Two. He understands any and all appointments are at the pleasure of the Council.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

RESOLUTION NO. 2022-720
(2022 Zoning Board of Adjustment Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS AND ALTERNATE MEMBERS TO SERVE ON THE ZONING BOARD OF ADJUSTMENT

WHEREAS, Members and Alternate Members of the Zoning Board of Adjustment serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth in Section 156.67(B)(1) of the City of Parker Code of Ordinances;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2024

The following are hereby appointed to serve on the Zoning Board of Adjustment as voting Members for a two-year term, beginning December 1, 2022 and expiring November 30, 2024, or until their successors are appointed and qualified:

Place 2 _____
Place 4 _____

SECTION 2. Appointment of Alternate Members with terms expiring November 30, 2024

The following are hereby appointed to serve on the Zoning Board of Adjustment as Alternate Members for a two-year term, beginning December 1, 2022 and expiring November 30, 2024, or until their successors are appointed and qualified:

Alternate 1 _____
Alternate 2 _____

SECTION 3. Appointment of Officers

Officers shall be appointed by the Zoning Board of Adjustment following the installation of the newly appointed Members and Alternate Members in accordance with Resolution No. 2021-658. Resolution No. 2021-683 is repealed only to the extent that it is inconsistent with this section. The remainder of Resolution No. 2021-683 shall remain in full force and effect.

SECTION 4 Effective Date

This resolution shall be effective upon its passage.

Proposed

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 15th day of November, 2022.

CITY OF PARKER:

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

RESOLUTION NO. 2021-683
(2021 Zoning Board of Adjustment Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS AND ALTERNATE MEMBERS TO SERVE ON THE ZONING BOARD OF ADJUSTMENT

WHEREAS, Members and Alternate Members of the Zoning Board of Adjustment serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth below:

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION 1. Appointment of Voting Members with terms expiring November30, 2023:

The following are hereby appointed to serve on the Zoning Board of Adjustment as voting members for a two-year term, expiring November 30, 2023, or until their successors are appointed and qualified.

Place 1	Steve Schoenekase
Place 3	Andrew Ellison
Place 5	Brian Deaver

SECTION 2. Appointment of Officers

The officers of the Zoning Board of Adjustment shall include a Chairperson and Vice-chairperson, for a term of two-years, expiring on the same date as the member's term, unless otherwise designated by council.

Chairperson	Andrew Ellison
Vice Chairperson	Brian Deaver

SECTION 5 Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 16th day of November, 2021.

CITY OF PARKER:

Lee Pettle, Mayor

ATTESTED:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Scott D. Levine, Interim City Attorney

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002

UNITED STATES POSTAGE PITNEY BOWES
02 1P $ 000.73⁰
0000930570 DEC 08 2021
MAILED FROM ZIP CODE 75002

Steve Schoenekase
7289 Moss Ridge Road
Parker, TX 75002

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002

UNITED STATES POSTAGE PITNEY BOWES
02 1P $ 000.73⁰
0000930570 DEC 08 2021
MAILED FROM ZIP CODE 75002

Andrew Ellison
6005 Dumont Ct.
Parker, TX 75002

Meeting Date: 11/15/2022 Item 7.

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002

UNITED STATES POSTAGE PITNEY BOWES
02 1P $ 000.73⁰
0000930570 DEC 08 2021
MAILED FROM ZIP CODE 75002

Brian Deaver
6004 Tamsworth Ct
Parker, TX 75002

1127

Meeting Date: 11/15/2022 Item 7.

RESOLUTION NO. 2020-653
(2020 Zoning Board of Adjustment Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS AND ALTERNATE MEMBERS TO SERVE ON THE ZONING BOARD OF ADJUSTMENT

WHEREAS, Members and Alternate Members of the Zoning Board of Adjustment serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth below:

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Zoning Board of Adjustment as voting members for the remainder of a two-year term, expiring November 30, 2022 or until their successors are appointed and qualified.

Place 2 Randy Kercho
Place 4 Don Dickson

SECTION 2. Appointment of Alternate Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Zoning Board of Adjustment as alternate members for the unexpired portion of a two-year term, expiring November 30, 2022 or until their successors are appointed and qualified.

Alternate 1 Jason Shepard
Alternate 2 Steve Schoenekase

SECTION 3 Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 17th day of November, 2020.

APPROVED:

Lee Pettle, Mayor

CITY OF PARKER COLLIN COUNTY, TEXAS

ATTEST:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Brandon Shelby, City Attorney

From: Lori Newton
To: Jason Shepard
Cc: Patti Grey
Subject: RE: Board Resignation
Date: Thursday, October 27, 2022 2:47:46 PM

Sorry to hear that. I will forward this to our city secretary. Have a great holiday season!

Thank you for your service.

Lori

From: Jason Shepard
Sent: Thursday, October 27, 2022 1:29 PM
To: Lori Newton <LNewton@parkertexas.us>
Subject: Board Resignation

Hi Lori –

Just letting you know that I will be moving from the City of Parker in a couple of weeks so I will need to resign my alternative board spot on the Zoning Board of Adjustment.

I've enjoyed the opportunity to serve and live in this great community. Best of luck in the future!

JS

Sent from Mail for Windows

Zoning Board of Adjustment 2022 Attendance

2

2022 Res. No. 2021-683			Place 3 Chairman Andrew Ellison	Place 4 Don Dickson	Place 1 Steve Schoenekase	Place 2 Randy Kercho	Place 5 Vice Chair Brian Deaver	Alternate 1 Jason Shepard	Alternate 2 Vacant
2022									
Jan									
Feb									
Mar									
Apr	6		✓	✓	Absent	✓	✓	✓ (Voting for Steve Schoenekase)	Vacant
May									
Jun									
Jul									
Aug									
Sept									
Oct									
Nov									
Dec									
2022 Absences			0	0	1	0	0	0	0

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	City Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	November 6, 2022
Exhibits:	• Proposed Resolution (Blank and List of Current Members) • Resolution 2021-682, 2021-692 and Resolution No. 2020-654 • Application(s) – (Email to Mayor/City Council only) ○ Lucy Estabrook • Attendance Record	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON RESOLUTION NO. 2022-721 MAKING APPOINTMENTS TO THE TO THE PARKS AND RECREATION COMMISSION.

SUMMARY

The following Parks and Recreation (P&R) Commission members, whose term(s) expire November 30th, expressed a desire to continue to serve on ZBA in their current positions:

Member	Position	Term Expiration	
Pier Burgess	Place Two (2)	Nov. 30, 2022	Would like to continue
Frank DaCosta	Place Four (4)	Nov. 30, 2022	Would like to continue
Donna DaCosta	Alt. 1 – One year term	Nov. 30, 2022	Would like to continue
Melanie Harris	Alt. 2 – One year term	Nov. 30, 2022	Would like to continue
Paula Johnston-Hutka	Alt. 3 – One year term	Nov. 30, 2022	Would like to continue
Cyndy Lane	Alt. 4 – One year term	Nov. 30, 2022	Would like to continue

Member	Position	Term Expiration	
Kimberly Hinshaw	Place One (1); Chair	Nov. 30, 2023	Term not up
LeAnn Turrentine	Place Three (3)	Nov. 30, 2023	Term not up
Cherie Ware	Place Five (5)	Nov. 30, 2023	Term not up

Please review application(s) -1 (Sent separately via email).

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	*Patti Scott Grey*	Date:	11/10/2022
City Attorney:	*Trey Lansford*	Date:	11/10/2022
City Administrator:	*Luke B. Olson*	Date:	11/11/2022

RESOLUTION NO. 2022-721
(2022 Parks and Rec Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS TO SERVE ON THE PARKS AND RECREATION COMMISSION

WHEREAS, Members of the Parks and Recreation Commission serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth in Section 97.05(A)(1); and

WHEREAS, Alternate Members of the Parks and Recreation Commission serve one-year terms commencing on December 1st and ending on November 30th, as set forth in Section 97.05(B) of the City of Parker Code of Ordinances;

NOW, THEREFORE, **BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:**

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2024:

The following are hereby appointed to serve on the Parks and Recreation Commission as voting Members for the two-year term, beginning December 1, 2022 and expiring November 30, 2024, or until their successors are appointed and qualified.

Place 2 _____
Place 4 _____

SECTION 2. Appointment of Alternate Members with terms expiring November 30, 2023:

The following are hereby appointed to serve on the Parks and Recreation Commission as Alternate Members for a one-year term, expiring November 30, 2023, or until their successors are appointed and qualified.

Alt 1 _____
Alt 2 _____
Alt 3 _____
Alt 4 _____

SECTION 3. Effective Date

This resolution shall be effective upon its passage.

Proposed

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 15th day of November, 2022.

CITY OF PARKER:

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

RESOLUTION NO. 2021-684
(Parks and Rec Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS TO SERVE ON THE PARKS AND RECREATION COMMISSION

WHEREAS, Members and Alternate members of the Parks and Recreation Commission serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth below; and

WHEREAS, the Parks and Recreation Commission is newly established therefore the members appointed herein shall begin service immediately and serve terms according to the Parks and Recreation Ordinance; and

NOW, THEREFORE, **BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:**

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Parks and Recreation Commission as voting members for the remainder of a two-year term, expiring November 30, 2022, or until their successors are appointed and qualified.

Place 2 Pier Burgess
Place 4 Frank DaCosta

SECTION 2. Appointment of Voting Members with terms expiring November 30, 2023:

The following are hereby appointed to serve on the Parks and Recreation Commission as voting members for a two-year term, expiring November 30, 2023, or until their successors are appointed and qualified.

Place 1 Kimberly Hinshaw
Place 3 LeAnn Turrentine
Place 5 Cherie Ware

SECTION 3. Appointment of Alternate Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Parks and Recreation Commission as voting members for a one-year term, expiring November 30, 2022, or until their successors are appointed and qualified.

Alt 1 Donna DaCosta
Alt 2 Melanie Harris

Alt 3 Paula Johnston - Hutka
Alt 4 Vacant

SECTION 2. Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 16th day of November, 2021.

CITY OF PARKER:

Lee Pettle, Mayor

ATTESTED:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Scott D. Levine, Interim City Attorney

CITY OF PARKER:-

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002



Russell Wright
5207 Estate Lane
Parker, TX 75094

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002



Wei Wei Jeang
2709 Dublin Rd
Parker, TX 75094

Meeting Date: 11/15/2022 Item 8.

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002



Jasmat Sutaria
5205 Creekside Ct.
Parker, TX 75094

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002

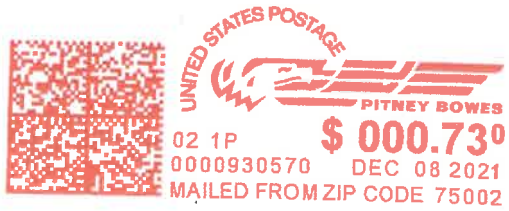


Larkin Crutcher
5305 Estate Lane
Parker, TX 75094

Meeting Date: 11/15/2022 Item 8.

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002



JR Douglas
5001 Hackberry Lane
Parker, TX 75002

CITY OF PARKER

5700 EAST PARKER ROAD • PARKER, TEXAS 75002



Todd Fecht
7234 Moss Ridge Circle
Parker, TX 75002

RESOLUTION NO. 2020-654
(Parks and Rec Appointments)

A RESOLUTION OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING MEMBERS TO SERVE ON THE PARKS AND RECREATION COMMISSION

WHEREAS, Members and Alternate members of the Parks and Recreation Commission serve in staggered two-year terms, commencing December 1st and ending on November 30th as set forth below; and

WHEREAS, the Parks and Recreation Commission is newly established therefore the members appointed herein shall begin service immediately and serve terms according to the Parks and Recreation Ordinance; and

NOW, THEREFORE, **BE IT RESOLVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:**

SECTION 1. Appointment of Voting Members with terms expiring November 30, 2022:

The following are hereby appointed to serve on the Parks and Recreation Commission as voting members for a two-year term, expiring November 30, 2022 or until their successors are appointed and qualified.

Place 2	Billy Barron (Chair)
Place 4	Frank DaCosta

SECTION 2. Appointment of Alternate Members with terms expiring November 30, 2021:

The following are hereby appointed to serve on the Parks and Recreation Commission as alternate members for a one-year term, expiring November 30, 2021 or until their successors are appointed and qualified.

Alt 1	Patti Cordina
Alt 2	Rick Debus
Alt 3	Donna DaCosta
Alt 4	Pier Burgess

SECTION 3. Effective Date

This resolution shall be effective upon its passage.

PASSED AND APPROVED by the City Council of the City of Parker, Collin County, Texas on this the 8th day of December, 2020.

APPROVED:

Lee Pettle, Mayor

ATTEST:

Patti Scott Grey, City Secretary

APPROVED AS TO FORM:

Brandon Shelby, City Attorney

City of Parker
Parks and Recreation

Attendance Report 2021-2022

	Place 1	Place 2		Place 3	Place 4	Place 5
Term Expires	23-Nov		22-Nov	23-Nov	22-Nov	23-Nov
Name	**Hinshaw**	**Burgess**		**Turrentine**	**F. DaCosta**	**Ware**
Dec-8,2021	√	√		√	√	x
Jan- 12,2022						
Feb -9,2022	√	√		√	√	x
Mar-9,2022	√	√		√	√	x
Apr-13,2022	√	√		√	√	√
May-11,2022	√	x		√	√	x
Jun-8,2022						
Jun-15,2022	√	√		√	√	√
Jul-13,2022	√	√		√	√	√
Aug-10,2022	√	√		√	√	√
Aug-31,2022	√	√		√	√	√
Sept-14,2022	√	√		√	√	x
Oct-12,2022	√	√		√	√	resigned
Nov-9,2022						
Nov-16,2022						

Alt 1 22-Nov **D. DaCosta**	Alt 2 22-Nov **Harris**	Alt 3 22-Nov **Johnston**	Alt 4 22-Nov **Lane**
x	√	√	x
√	√	x	√
√	√	x	x
√	x	x	√
√	√	x	x
√	x	x	x
√	x	x	√
√	x	x	x
√	x	x	√
√	x	x	√
√	x	x	√

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council/Administration
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	November 7, 2022
Exhibits:	• Proposed Ordinance	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 831 APPOINTING A DEPUTY CITY SECRETARY WITH THE POWERS AND DUTIES TO ASSIST WITH SAID OFFICE AND TO SERVE IN THE ABSENCE OF THE CITY SECRETARY.

SUMMARY

Please review information provided.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:		Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

ORDINANCE NO. 831
(Deputy City Secretary Appointment)

AN ORDINANCE OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, APPOINTING A DEPUTY CITY SECRETARY WITH THE POWERS AND DUTIES TO ASSIST WITH SAID OFFICE AND TO SERVE IN THE ABSENCE OF THE CITY SECRETARY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Texas Local Government Code, Chapter 22. Subchapter C, Sec. 22.071; entitled "Other Municipal Officers," permits the governing body of the municipality to appoint by ordinance "other officers or agents" as may be authorized by the governing body in addition to the positions specifically enumerated in that section, as necessary to carry out the municipality's functions, and;

WHEREAS, Section 22.071(c) further specifies that the governing body may confer on "other municipal officers the powers and duties of an officer provided for by this section;" and

WHEREAS, Section 22.073 sets forth the duties and responsibilities of the Office of the City Secretary; and

WHEREAS, those duties include, but are not limited to preparation of notices, recording of minutes associated with all posted agendas, and authentication of official documents of the City with the City seal, and;

WHEREAS, in the absence of the City Secretary, the Deputy City Secretary would assume the powers and duties of the office;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS:

Section 1. The findings set forth in the preamble of this Ordinance are incorporated by reference into the body of this Ordinance as if fully set forth herein.

Section 2. The City Council hereby appoints Lori Newton as the Deputy City Secretary of the City of Parker and authorized her to act in the absence of the City Secretary with all the authority of the City Secretary as provided in the statutory and common laws of the State of Texas and the Code of Ordinances of the City of Parker, Texas.

Section 3. It is hereby officially found and determined that the meeting at which this Ordinance is passed was open to the public as required and that public notice of the time, place, and purpose of said meeting was given as required by the Open Meetings Act, Chapter 551, Texas Government Code.

Section 4. This Ordinance shall take effect immediately upon passage and approval.

Proposed

PASSED AND APPROVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS, THIS 15TH DAY OF NOVEMBER, 2022.

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

Council Agenda Item

Budget Account Code:		Meeting Date:	See above.
Budgeted Amount:		Department/ Requestor:	Luke B. Olson City Administrator
Fund Balance-before expenditure:		Prepared by:	Luke B. Olson
Estimated Cost:		Date Prepared:	November 3, 2022
Exhibits:	None		

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ON APPOINTING A WEBSITE DEVELOPMENT SUBCOMMITTEE.

SUMMARY

Over the past several years, and during the most recent budget workshops, the City of Parker website has been repeatedly identified as needing an update. The City's website service provider, Civic Plus, has proposed several general options to proceed with varying costs. The sub-committee would meet with city staff and Civic Plus personnel during working hours to review the options and sit through demonstrations of website interfaces. The sub-committee would then make a presentation to City Council and make a recommendation regarding updates and cost for the website.

POSSIBLE ACTION

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	*Enter Text Here*	Date:	Enter Text Here
City Attorney:	Enter Text Here	Date:	Enter Text Here

City Administrator:	*Enter Text Here*	Date:	Enter Text Here

/

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council
Fund Balance-before expenditure:	Prepared by:	Luke B. Olson City Administrator
Estimated Cost:	Date Prepared:	November 3, 2022
Exhibits:	•	

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION ACCEPTING A DONATION OF THE FAJITA WAGON LUNCHEON IN THE TOTAL AMOUNT OF $1,500.00 FROM MR. AND MRS CHISOLM.

SUMMARY

Mr. and Mrs. Chisolm graciously made arrangements for a Fajita Wagon to come up and provide City Employees lunch on 11/09/2022.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/032022
City Attorney:	Trey Lansford	Date:	11/03/2022 via Municode Software
City Administrator:	Luke B. Olson	Date:	11/03/2022

Council Agenda Item

Budget Account Code:		Meeting Date:	November 8, 2022
Budgeted Amount:		Department/ Requestor:	Luke B. Olson City Administrator
Fund Balance-before expenditure:		Prepared by:	Luke B. Olson
Estimated Cost:		Date Prepared:	November 8, 2022
Exhibits:	1. Both Decommissioned 2. Fire Quote Vehicle 3. Police Quote 4. Fire Outfit Costs 5. Police Outfit Costs 6. Tahoe Conversion Costs		

AGENDA SUBJECT

CONSIDERATION AND/OR ANY APPROPRIATE ACTION REGARDING VEHICLE ORDERS UNDER THE ENTERPRISE CONTRACT

SUMMARY

Police Department

The Police Department will move one of the two vehicles currently assigned to CID and Command into a patrol vehicle. The CID and Command vehicles are pursuit rated. The City of Parker will be purchasing one non-pursuit rated Explorer to replace the Command or CID vehicle. Concurrently, Unit 18-201 will be retired from the fleet, which is Chevrolet Tahoe. It will cost $1,500 to decommission this unit. Enterprise is still looking for another non-pursuit rated Explorer to replace the other pursuit rated Tahoe. The Tahoe which moves over the Patrol will cost $7,345.22 to outfit. The total Cost for the new Explorer will be $56,132. Half of the equipment will be paid upfront on the cost and the rest rolled into the price. Therefore, Enterprise will be paid roughly $8,338.78 upfront, reducing cost financed to $47,793.77, which will be paid out over 60 monthly installments. This vehicle will also be under the maintenance plan with Enterprise.

Fire Department

The Fire Department is replacing the current command Tahoe with a non-pursuit rated Explorer equipped as a command vehicle for Fire. Concurrently, fire is retiring the Command Tahoe. The decommissioning of the Tahoe will cost $1,500. The total cost of the new Fire Department Command Explorer will $69,8861.12. Half of the equipment cost is due upfront which is roughly $14,875. This will leave a total price of $54,996.56 which will be paid out over 60 months. This vehicle will also be under the maintenance plan with Enterprise

POSSIBLE ACTION

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	*Luke B. Olson*	Date:	Enter Text Here
City Attorney:	*Trey Lansford*	Date:	Enter Text Here
City Administrator:	*Luke B. Olson*	Date:	Enter Text Here

Priority Public Safety LLC
659 Martin Duke Road
Van Alstyne, TX 75495
+1 9034829357
dkirby@priorityps.net

PRIORITY PUBLIC SAFETY
SALES SERVICE INSTALLATION

Estimate

ADDRESS
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

SHIP TO
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

ESTIMATE # 7137
DATE 11/07/2022
EXPIRATION DATE 12/06/2022

REP
TM

DATE	ACTIVITY	QTY	RATE	AMOUNT
	Message Decommission strip of retiring unit, all equipment to be carried over from unit to Former Command unit that is being rotated into fleet.	1	0.00	0.00
	LABOR Labor to decommission unit	1	1,500.00	1,500.00

Thank you for doing business with us.

SUBTOTAL	1,500.00
TAX	0.00
TOTAL	**$1,500.00**

Accepted By

Accepted Date

Priority Public Safety LLC
659 Martin Duke Road
Van Alstyne, TX 75495
+1 9034829357
dkirby@priorityps.net

PRIORITY PUBLIC SAFETY
SALES SERVICE INSTALLATION

Estimate

ADDRESS
Parker Fire Department

ESTIMATE # 7140
DATE 11/07/2022
EXPIRATION DATE 12/06/2022

REP
TM

DATE	ACTIVITY	QTY	RATE	AMOUNT
	WE-BSFW50Z Whelen Inner Edge Ford Police Interceptor Utility, 2020, Ten Lamps, SOLO™ or DUO™, Upper Front Two Piece Unit, Individual Driver and Passenger Side Units (No Take-Downs) (Ten Lights Total) (Works with Factory Option 76P)	1	3,495.00	3,495.00
	WE-ISDD Whelen DUO Red/White Inner Edge Modules	5	0.00	0.00
	WE-ISDE Whelen DUO Blue/White Inner Edge Modules	5	0.00	0.00
	WE-C399 Whelen Cencom Core WeCan X Control Module	1	0.00	0.00
	WE-C399K4 Whelen 2020 Ford Interceptor Utility Gateway Installation Kit for use WITHOUT Ford 61B Factory Option	1	0.00	0.00
	WE-CCTL5 Whelen WCX Handheld Control Head	1	0.00	0.00
	WE-SA315P Whelen 100 Watt Speaker	1	0.00	0.00
	WE-SAK1 Whelen Universal L Speaker bracket	1	0.00	0.00
	WE-BS508 Whelen Rear Inner Edge Ford Police Interceptor Utility, 2020-2021, SOLO™ or DUO™, Upper Rear Housing for Eight Lamp	1	0.00	0.00
	WE-ISDK Whelen Inner Edge DUO module Red/Amber	1	0.00	0.00
	WE-ISDM	1	0.00	0.00

DATE	ACTIVITY	QTY	RATE	AMOUNT
	Whelen Inner Edge DUO Module Blue/Amber			
	WE-I3JC Whelen ION Red/Blue/White with White Override Universal Mount LED - mounted in grille (2) mounted on rear license plate bracket - wire with white override to take down - cruise and DVI pattern in park for red/blue - customer may choose to omit blue flashing	6	138.60	831.60
	WE-IONBKT1 Whelen ION License plate bracket	1	25.79	25.79
	WE-TLIG Whelen Thin ION Green - mounted in flat portion near headlight	2	132.00	264.00
	WE-TLI2D Whelen Thin ION LED - Red/White - mounted on tailgate - visible with lift gate opened - mounted to front of running board on each side and rear of running board each side - mounted to sides of front bumper fascia (1) per side - mounted on mirrors (1) per side - white override to alley - red wired to cruise and DVI in park	9	113.40	1,020.60
	WE-TLI2E Whelen Thin ION LED - Blue/White - mounted on tailgate - visible with lift gate open - mounted on rear of running board on each side - white override to alley - red wired to cruise and DVI in park	3	113.40	340.20
	WE-LINSV2R Whelen Surface Mount LINS V series (red) - red wired for cruise and DVI pattern in park - white override to alley	1	175.80	175.80
	WE-LINSV2B Whelen Surface Mount LINS V series (blue) - blue wired for cruise and DVI pattern in park - white override to alley	1	175.80	175.80
	WE-LSVBKT50 Whelen New! Ford Police Interceptor Utility 2020, Under-the-Side View Mirror Mount for Two LINSV2™ Series Sold Separately, Pair (For use with Ford's Factory Side Marker LED Side View Mirror Option)	1	19.80	19.80
	WE-AVC22DE Whelen Dual Avenger DUO Red/White Blue/White - mounted in side cargo windows - if LED allows wire red/blue to cruise and DVI and white override to alley	2	277.20	554.40
	WE-IONG Whelen Multi-Mount ION - Green - mounted at bottom of cargo windows and bottom of rear hatch window	4	135.60	542.40

DATE	ACTIVITY	QTY	RATE	AMOUNT
	SO-EGTTE794H Sound Off Opticom Infrared LED Emitter Module 794H includes Bracket & Mounting Hardware with 25ft of cable with mating connector	1	1,956.50	1,956.50
	SHOP SUPPLIES Stalker bracket to replace in center of dash near windshield - use to mount Opticom for best visibility	1	299.00	299.00
	WE-CEXAMP Whelen WeCanX™ External Amplifier	1	214.20	214.20
	WE-SA315P Whelen 100 Watt Speaker	1	234.60	234.60
	WE-SAK1 Whelen Universal L Speaker bracket	1	35.50	35.50
	WE-CHOWLER Whelen Siren Amplifier with Two Speakers, Optional Vehicle Specific Mounting Brackets, No Charge When Purchased with Howler System	1	538.80	538.80
	WE-HWLRB23 Whelen Howler Universal mounting brackets	1	0.00	0.00
	HAV-PKG-PSM-3006 Havis Premium Passenger Side Mount package for 2020+ Ford Interceptor SUV	1	574.04	574.04
	HAV-DS-PAN-432-2 Havis Docking Station with Dual Pass-through Antenna and Power Supply for Panasonic's Toughbook 54 and 55 Rugged Laptop	1	1,071.17	1,071.17
	HAV-CG-X Havis Shield Charge Guard Auto Shut off Timer	1	90.00	90.00
	SL-75812 Streamlight Stinger DS LED flashlight w/DC charger - one mounted on driver side of console, one mounted on rear command box	2	175.00	350.00
	BR-930W 3 hole outlet box - hardwire - 15A circuit breaker protected - flange mount - mounted on rear cargo box	2	65.00	130.00
	SHOP SUPPLIES Weather Tech Floor Mats - Front and second row 441632-1-2IM	1	350.00	350.00
	SHOP SUPPLIES Coaxial Cable for prewiring purposes - must cap for delivery	6	90.00	540.00
	SHOP SUPPLIES Kussmaul Auto Eject System - Plug cover determined by customer	1	4,995.00	4,995.00

DATE	ACTIVITY	QTY	RATE	AMOUNT
	WE-60CREGCS Whelen 12V White/Red Compartment Light - mounted over console	1	146.40	146.40
	WE-3SRCCDCR Whelen 3SRCCDCR round split red/white Compartment light - mounted on rear hatch door and 2 inside cargo area over storage box	4	58.88	235.52
	SWITCH Heavy Duty Lighted Rocker Switch	1	20.00	20.00
	GRAPHICS Custom Design Vehicle Graphics Ghost Rear Chevrons (RED) Gold Leaf "FIRE CHIEF" on both front quarter panel above front wheels Graphic package to mimic Fire Engine Final determination will involve renderings with customer approval	1	4,800.00	4,800.00
	Shipping and Handling Shipping and Handling	1	295.00	295.00
	SHOP SUPPLIES Shop supplies, misc. connectors, tape, lime, nuts, bolts	1	175.00	175.00
	WIRE-HAR Custom Wiring Harness made to order	1	175.00	175.00
	WE-PROGRAM1 Scan lock programmer	1	250.00	250.00
	LABOR Labor to install listed equipment: and all customer supplied equipment	1	4,830.00	4,830.00

Thank you for doing business with us.

SUBTOTAL	29,751.12
TAX	0.00
TOTAL	**$29,751.12**

Accepted By

Accepted Date

enterprise | FLEET MANAGEMENT

Open-End (Equity) Lease Rate Quote

Quote No. 2017018

Meeting Date: 11/15/2022 Item 12.

Prepared For: City of Parker - Fire
Sheff, Mike

Date 11/08/2022
AE/AM NH1/SNL

Unit #
Year 2022 **Make** Ford **Model** Explorer
Series XLT 4dr 4x2
Vehicle Order Type In-Stock **Term** 60 **State** TX **Customer#** 622369

$ 40,115.00		Capitalized Price of Vehicle[1]
$ 0.00	*	License and Certain Other Charges 6.2500% **State** TX
$ 158.50	*	Initial License Fee
$ 0.00		Registration Fee
$ 0.00		Other:Courtesy Delivery Fee
$ 0.00		Capitalized Price Reduction
$ 0.00		Tax on Capitalized Price Reduction
$ 0.00		Gain Applied From Prior Unit
$ 0.00	*	Tax on Gain On Prior
$ 0.00	*	Security Deposit
$ 0.00	*	Tax on Incentive (Taxable Incentive Total : $0.00)
$ 40,115.00		Total Capitalized Amount (Delivered Price)
$ 621.78		Depreciation Reserve @ 1.5500%
$ 207.03		Monthly Lease Charge (Based on Interest Rate - Subject to a Floor)[2]
$ 828.81		**Total Monthly Rental Excluding Additional Services**
		Additional Fleet Management
		Master Policy Enrollment Fees
$ 0.00		Commercial Automobile Liability Enrollment
		Liability Limit $0.00
$ 0.00		Physical Damage Management — Comp/Coll Deductible 0 / 0
$ 0.00		Full Maintenance Program[3] Contract Miles 0 — OverMileage Charge $ 0.0550 Per Mile
		Incl: # Brake Sets (1 set = 1 Axle) 0 — # Tires 0 — Loaner Vehicle Not Included
$ 0.00		**Additional Services SubTotal**
$ 0.00		Use Tax 0.0000% **State**
$ 828.81		**Total Monthly Rental Including Additional Services**
$ 2,808.20		Reduced Book Value at 60 Months
$ 395.00		Service Charge Due at Lease Termination

All language and acknowledgments contained in the signed quote apply to all vehicles that are ordered under this signed quote.

Order Information

Driver Name	
Exterior Color	(0 P) Rapid Red Metallic Tinted Clearcoat
Interior Color	(0 I) Ebony w/Unique Cloth Captain's Chairs
Lic. Plate Type	Exempt
GVWR	0

Quote based on estimated annual mileage of 15,000
(Current market and vehicle conditions may also affect value of vehicle)
(Quote is Subject to Customer's Credit Approval)
Notes

Enterprise FM Trust will be the owner of the vehicle covered by this Quote. Enterprise FM Trust (not Enterprise Fleet Management) will be the Lessor of such vehicle under the Master Open - End (Equity) Lease Agreement and shall have all rights and obligations of the Lessor under the Master Open - End (Equity) Lease Agreement with respect to such vehicle.
Lessee must maintain insurance coverage on the vehicle as set forth in Section 11 of the Master Open-End (Equity) Lease Agreement until the vehicle is sold.

ALL TAX AND LICENSE FEES TO BE BILLED TO LESSEE AS THEY OCCUR.

Lessee hereby authorizes this vehicle order, agrees to lease the vehicle on the terms set forth herein and in the Master Equity Lease Agreement and agrees that Lessor shall have the right to collect damages in the event Lessee fails or refuses to accept delivery of the ordered vehicle. Lessee certifies that it intends that more than 50% of the use of the vehicle is to be in a trade or business of the Lessee.

LESSEE City of Parker - Fire

BY **TITLE** **DATE**

* INDICATES ITEMS TO BE BILLED ON DELIVERY.

[1] Capitalized Price of Vehicle May be Adjusted to Reflect Final Manufacturer's Invoice. Lessee Hereby Assigns to Lessor anyManufacturer Rebates And/Or Manufacturer Incentives Intended for the Lessee, Which Rebates And/Or Incentives Have Been UsedBy Lessor to Reduce the Capitalized Price of the Vehicle.

[2] Monthly Lease Charge Will Be Adjusted to Reflect the Interest Rate on the Delivery Date (Subject to a Floor).

[3] The inclusion herein of references to maintenance fees/services are solely for the administrative convenience of Lessee. Notwithstanding the inclusion of such references in this [Invoice/Schedule/Quote], all such maintenance services are to be performed by Enterprise Fleet Management, Inc., and all such maintenance fees are payable by Lessee solely for the account of Enterprise Fleet Management, Inc., pursuant to that certain separate [Maintenance Agreement] entered into by and between Lessee and Enterprise Fleet Management, Inc.; provided that such maintenance fees are being billed by Enterprise FM Trust, and are payable at the direction of Enterprise FM Trust, solely as an authorized agent for collection on behalf of Enterprise Fleet Management, Inc.

Open-End (Equity) Lease Rate Quote

VEHICLE INFORMATION:

2022 Ford Explorer XLT 4dr 4x2 - US

Series ID: K7D

Pricing Summary:

	INVOICE	MSRP
Base Vehicle	$37,027	$38,570.00
Total Options	$555.00	$583.00
Destination Charge	$1,495.00	$1,495.00
Total Price	**$39,077.00**	**$40,648.00**

SELECTED COLOR:

Exterior: D4-(0 P) Rapid Red Metallic Tinted Clearcoat

Interior: 86-(0 I) Ebony w/Unique Cloth Captain's Chairs

SELECTED OPTIONS:

CODE	DESCRIPTION	INVOICE	MSRP
119WB	119.1" Wheelbase	STD	STD
153	Front License Plate Bracket	NC	NC
200A	Equipment Group 200A	NC	NC
21F	Cargo Area Management System	$155.00	$165.00
425	50 State Emissions System	STD	STD
44T	Transmission: 10-Speed Automatic	Included	Included
52X	Auto Start-Stop Removal	$-47.00	$-57.00
59W	4G LTE Wi-Fi Hotspot Removal Credit	$-18.00	$-20.00
8	Unique Cloth Captain's Chairs	Included	Included
86_02	(0 I) Ebony w/Unique Cloth Captain's Chairs	NC	NC
99H	Engine: 2.3L EcoBoost I-4	Included	Included
CONECT	FordPass Connect	Included	Included
D4_01	(0 P) Rapid Red Metallic Tinted Clearcoat	$465.00	$495.00
HEAT	1st Row Heated Seats	Included	Included
PAINT	Monotone Paint Application	STD	STD
STDAX	3.58 Non-Limited-Slip Rear Axle Ratio	Included	Included
STDGV	GVWR: TBD	Included	Included
STDRD	Radio: AM/FM Stereo	Included	Included
STDTR	Tires: P255/65R18 AS BSW	Included	Included
STDWL	Wheels: 18" 5-Spoke Silver-Painted Aluminum	Included	Included
SYNC	SYNC 3 Communications & Entertainment System	Included	Included

CONFIGURED FEATURES:

Body Exterior Features:

- Number Of Doors 4
- Driver And Passenger Mirror: power remote heated manual folding side-view door mirrors
- Spoiler: rear lip spoiler
- Door Handles: body-coloured
- Front And Rear Bumpers: body-coloured front and rear bumpers
- Front License Plate Bracket: front license plate bracket
- Body Material: galvanized steel/aluminum body material
- Roof Rack: rails only
- Body Side Cladding: black bodyside cladding
- Grille: grille with chrome bar

Convenience Features:

- Air Conditioning automatic dual-zone front air conditioning
- Air Filter: air filter
- Rear Air Conditioning: rear air conditioning with separate controls
- Voice Activated A/C: voice activated air conditioning
- Cruise Control: cruise control with steering wheel controls
- Trunk/Hatch/Door Remote Release: power cargo access remote release
- Power Windows: power windows with driver and passenger 1-touch down
- 1/4 Vent Rear Windows: power rearmost windows
- Remote Keyless Entry: keyfob (all doors) remote keyless entry
- Illuminated Entry: illuminated entry
- Integrated Key Remote: integrated key/remote
- Auto Locking: auto-locking doors
- Passive Entry: Intelligent Access proximity key
- Trunk FOB Controls: keyfob trunk/hatch/door release
- Remote Engine Start: remote engine start - smart device only (subscription required)
- Steering Wheel: steering wheel with manual tilting, manual telescoping
- Day-Night Rearview Mirror: day-night rearview mirror
- Driver and Passenger Vanity Mirror: illuminated auxiliary driver and passenger-side visor mirrors
- Emergency SOS: SYNC 3 911 Assist emergency communication system
- Front Cupholder: front and rear cupholders
- Floor Console: full floor console with covered box
- Overhead Console: mini overhead console with storage
- Glove Box: locking glove box
- Driver Door Bin: driver and passenger door bins
- Rear Door Bins: rear door bins
- Seatback Storage Pockets: 2 seatback storage pockets
- Driver Footrest: driver's footrest
- Retained Accessory Power: retained accessory power
- Power Accessory Outlet: 4 12V DC power outlets

Entertainment Features:

- radio SiriusXM AM/FM/Satellite with seek-scan
- Voice Activated Radio: voice activated radio
- Speed Sensitive Volume: speed-sensitive volume
- Steering Wheel Radio Controls: steering-wheel mounted audio controls
- Speakers: 6 speakers
- Internet Access: FordPass Connect 4G internet access
- 1st Row LCD: 2 1st row LCD monitor
- Wireless Connectivity: wireless phone connectivity
- Antenna: integrated roof antenna

Lighting, Visibility and Instrumentation Features:

- Headlamp Type delay-off aero-composite LED low/high beam headlamps
- Auto-Dimming Headlights: Ford Co-Pilot360 - Auto High Beam auto high-beam headlights
- Front Wipers: variable intermittent speed-sensitive wipers wipers
- Rear Window wiper: fixed interval rear window wiper with heating wiper park

Rear Window Defroster: rear window defroster
Tinted Windows: deep-tinted windows
Dome Light: dome light with fade
Front Reading Lights: front and rear reading lights
Ignition Switch: ignition switch light
Variable IP Lighting: variable instrument panel lighting
Display Type: analog appearance
Tachometer: tachometer
Compass: compass
Exterior Temp: outside-temperature display
Low Tire Pressure Warning: tire specific low-tire-pressure warning
Park Distance Control: Reverse Sensing System rear parking sensors
Trip Computer: trip computer
Trip Odometer: trip odometer
Lane Departure Warning: lane departure
Blind Spot Sensor: blind spot
Front Pedestrian Braking: pedestrian detection
Following Distance Indicator: following distance alert
Forward Collision Alert: forward collision
Water Temp Gauge: water temp. gauge
Oil Level Gauge: oil level gauge
Clock: in-radio display clock
Systems Monitor: systems monitor
Check Control: redundant digital speedometer
Rear Vision Camera: rear vision camera
Oil Pressure Warning: oil-pressure warning
Water Temp Warning: water-temp. warning
Battery Warning: battery warning
Lights On Warning: lights-on warning
Key in Ignition Warning: key-in-ignition warning
Low Fuel Warning: low-fuel warning
Low Washer Fluid Warning: low-washer-fluid warning
Bulb Failure Warning: bulb-failure warning
Door Ajar Warning: door-ajar warning
Trunk Ajar Warning: trunk-ajar warning
Brake Fluid Warning: brake-fluid warning
Transmission Fluid Temperature Warning: transmission-fluid-temperature warning

Safety And Security:

ABS four-wheel ABS brakes
Number of ABS Channels: 4 ABS channels
Brake Assistance: brake assist
Brake Type: four-wheel disc brakes
Vented Disc Brakes: front and rear ventilated disc brakes
Daytime Running Lights: daytime running lights
Spare Tire Type: compact spare tire
Spare Tire Mount: spare tire mounted inside under cargo
Driver Front Impact Airbag: driver and passenger front-impact airbags
Driver Side Airbag: seat-mounted driver and passenger side-impact airbags
Overhead Airbag: Safety Canopy System curtain 1st, 2nd and 3rd row overhead airbag
Knee Airbag: knee airbag
Occupancy Sensor: front passenger airbag occupancy sensor
Height Adjustable Seatbelts: height adjustable front seatbelts
Seatbelt Pretensioners: front seatbelt pre-tensioners
Side Impact Bars: side-impact bars
Perimeter Under Vehicle Lights: remote activated perimeter/approach lights
Tailgate/Rear Door Lock Type: tailgate/rear door lock included with power door locks
Rear Child Safety Locks: rear child safety locks
Ignition Disable: SecuriLock immobilizer
Security System: security system

Panic Alarm: panic alarm
Electronic Stability: AdvanceTrac w/Roll Stability Control electronic stability stability control with anti-roll
Traction Control: ABS and driveline traction control
Front and Rear Headrests: manual adjustable front head restraints
Rear Headrest Control: 2 rear head restraints
3rd Row Headrests: 2 manual adjustable third row head restraints

Seats And Trim:

Seating Capacity max. seating capacity of 6
Front Bucket Seats: front bucket seats
Front Heated Cushion: driver and passenger heated-cushions
Front Heated Seatback: driver and passenger heated-seatbacks
Number of Driver Seat Adjustments: 8-way driver and passenger seat adjustments
Reclining Driver Seat: power reclining driver and passenger seats
Driver Lumbar: power 2-way driver and passenger lumbar support
Driver Height Adjustment: power height-adjustable driver and passenger seats
Driver Fore/Aft: power driver and passenger fore/aft adjustment
Driver Cushion Tilt: power driver and passenger cushion tilt
Front Centre Armrest Storage: front centre armrest
Rear Seat Type: rear manual reclining captain seat
Rear Seat Fore/Aft: manual rear seat fore/aft adjustment
Rear Folding Position: rear seat fold-forward seatback
Rear Seat Mounted Armrests: rear seat mounted armrest
3rd Row Seat Type: fixed third row 50-50 bench seat
3rd Row Electric Control: fold into floor third row seat
Leather Upholstery: premium cloth front and rear seat upholstery
Door Trim Insert: cloth door panel trim
Headliner Material: full cloth headliner
Floor Covering: full carpet floor covering
Dashboard Console Insert, Door Panel Insert Combination: metal-look/piano black instrument panel insert, door panel insert, console insert
LeatherSteeringWheel: leather/metal-look steering wheel
Floor Mats: carpet front and rear floor mats
Interior Accents: chrome/metal-look interior accents
Cargo Space Trim: carpet cargo space
Trunk Lid: plastic trunk lid/rear cargo door
Cargo Mats: carpet and rubber cargo mat
Cargo Tie Downs: cargo tie-downs
Cargo Light: cargo light
Concealed Cargo Storage: concealed cargo storage
Cargo Net: cargo net

Standard Engine:

Engine 300-hp, 2.3-liter I-4 (premium)

Standard Transmission:

Transmission 10-speed automatic w/ OD

enterprise | FLEET MANAGEMENT

Open-End (Equity) Lease Rate Quote

Quote No. 6701804

Meeting Date: 11/15/2022 Item 12.

Prepared For: City of Parker Texas
Savage, Grant

Date 11/02/2022
AE/AM NH1/SNL

Unit # 26GK6C
Year 2022 **Make** Ford **Model** Explorer
Series XLT 4dr 4x2
Vehicle Order Type In-Stock **Term** 60 **State** TX **Customer#** 618708

$ 56,132.55		Capitalized Price of Vehicle[1]
$ 0.00	*	License and Certain Other Charges 6.2500% **State** TX
$ 158.50	*	Initial License Fee
$ 0.00		Registration Fee
$ 0.00		Other:Courtesy Delivery Fee
$ 8,338.78	*	Capitalized Price Reduction
$ 0.00	*	Tax on Capitalized Price Reduction
$ 0.00		Gain Applied From Prior Unit
$ 0.00	*	Tax on Gain On Prior
$ 0.00	*	Security Deposit
$ 0.00	*	Tax on Incentive (Taxable Incentive Total : $0.00)
$ 47,793.77		Total Capitalized Amount (Delivered Price)
$ 740.80		Depreciation Reserve @ 1.5500%
$ 258.67		Monthly Lease Charge (Based on Interest Rate - Subject to a Floor)[2]
$ 999.47		**Total Monthly Rental Excluding Additional Services**
		Additional Fleet Management
		Master Policy Enrollment Fees
$ 0.00		Commercial Automobile Liability Enrollment
		Liability Limit $0.00
$ 0.00		Physical Damage Management — Comp/Coll Deductible 0 / 0
$ 0.00		Full Maintenance Program[3] Contract Miles 0 — OverMileage Charge $ 0.0550 Per Mile
		Incl: # Brake Sets (1 set = 1 Axle) 0 — # Tires 0 — Loaner Vehicle Not Included
$ 0.00		**Additional Services SubTotal**
$ 0.00		Use Tax 0.0000% **State**
$ 999.47		**Total Monthly Rental Including Additional Services**
$ 3,345.77		Reduced Book Value at 60 Months
$ 395.00		Service Charge Due at Lease Termination

All language and acknowledgments contained in the signed quote apply to all vehicles that are ordered under this signed quote.

Order Information

Driver Name	
Exterior Color	(0 P) Iconic Silver Metallic
Interior Color	(0 I) Ebony w/Unique Cloth Captain's Chairs
Lic. Plate Type	Exempt
GVWR	0

Quote based on estimated annual mileage of 15,000
(Current market and vehicle conditions may also affect value of vehicle)
(Quote is Subject to Customer's Credit Approval)
Notes

Enterprise FM Trust will be the owner of the vehicle covered by this Quote. Enterprise FM Trust (not Enterprise Fleet Management) will be the Lessor of such vehicle under the Master Open - End (Equity) Lease Agreement and shall have all rights and obligations of the Lessor under the Master Open - End (Equity) Lease Agreement with respect to such vehicle.
Lessee must maintain insurance coverage on the vehicle as set forth in Section 11 of the Master Open-End (Equity) Lease Agreement until the vehicle is sold.

ALL TAX AND LICENSE FEES TO BE BILLED TO LESSEE AS THEY OCCUR.

Lessee hereby authorizes this vehicle order, agrees to lease the vehicle on the terms set forth herein and in the Master Equity Lease Agreement and agrees that Lessor shall have the right to collect damages in the event Lessee fails or refuses to accept delivery of the ordered vehicle. Lessee certifies that it intends that more than 50% of the use of the vehicle is to be in a trade or business of the Lessee.

LESSEE City of Parker Texas

BY **TITLE** **DATE**

* INDICATES ITEMS TO BE BILLED ON DELIVERY.

[1] Capitalized Price of Vehicle May be Adjusted to Reflect Final Manufacturer's Invoice. Lessee Hereby Assigns to Lessor anyManufacturer Rebates And/Or Manufacturer Incentives Intended for the Lessee, Which Rebates And/Or Incentives Have Been UsedBy Lessor to Reduce the Capitalized Price of the Vehicle.

[2] Monthly Lease Charge Will Be Adjusted to Reflect the Interest Rate on the Delivery Date (Subject to a Floor).

[3] The inclusion herein of references to maintenance fees/services are solely for the administrative convenience of Lessee. Notwithstanding the inclusion of such references in this [Invoice/Schedule/Quote], all such maintenance services are to be performed by Enterprise Fleet Management, Inc., and all such maintenance fees are payable by Lessee solely for the account of Enterprise Fleet Management, Inc., pursuant to that certain separate [Maintenance Agreement] entered into by and between Lessee and Enterprise Fleet Management, Inc.; provided that such maintenance fees are being billed by Enterprise FM Trust, and are payable at the direction of Enterprise FM Trust, solely as an authorized agent for collection on behalf of Enterprise Fleet Management, Inc.

Aftermarket Equipment Total

Description	(B)illed or (C)apped	Price
Custom Equipment - PRIORITY PUBLIC SAFETY ESTIMATE# 7125	C	$ 16,677.55
Total Aftermarket Equipment Billed		$ 0.00
Total Aftermarket Equipment Capitalized		$ 16,677.55
Aftermarket Equipment Total		$ 16,677.55

VEHICLE INFORMATION:

2022 Ford Explorer XLT 4dr 4x2 - US

Series ID: K7D

Pricing Summary:

	INVOICE	MSRP
Base Vehicle	$37,027	$38,570.00
Total Options	$-65.00	$-77.00
Destination Charge	$1,495.00	$1,495.00
Total Price	**$38,457.00**	**$39,988.00**

SELECTED COLOR:

Exterior: JS-(0 P) Iconic Silver Metallic

Interior: 86-(0 I) Ebony w/Unique Cloth Captain's Chairs

SELECTED OPTIONS:

CODE	DESCRIPTION	INVOICE	MSRP
119WB	119.1" Wheelbase	STD	STD
200A	Equipment Group 200A	NC	NC
8	Unique Cloth Captain's Chairs	Included	Included
153	Front License Plate Bracket	NC	NC
425	50 State Emissions System	STD	STD
44T	Transmission: 10-Speed Automatic	Included	Included
52X	Auto Start-Stop Removal	$-47.00	$-57.00
59W	4G LTE Wi-Fi Hotspot Credit	$-18.00	$-20.00
86_02	(0 I) Ebony w/Unique Cloth Captain's Chairs	NC	NC
99H	Engine: 2.3L EcoBoost I-4	Included	Included
CONECT	FordPass Connect	Included	Included
HEAT	1st Row Heated Seats	Included	Included
JS_01	(0 P) Iconic Silver Metallic	NC	NC
PAINT	Monotone Paint Application	STD	STD
STDAX	3.58 Non-Limited-Slip Rear Axle Ratio	Included	Included
STDGV	GVWR: TBD	Included	Included
STDRD	Radio: AM/FM Stereo	Included	Included
STDTR	Tires: P255/65R18 AS BSW	Included	Included
STDWL	Wheels: 18" 5-Spoke Silver-Painted Aluminum	Included	Included
SYNC	SYNC 3 Communications & Entertainment System	Included	Included

CONFIGURED FEATURES:

Body Exterior Features:

- Number Of Doors 4
- Driver And Passenger Mirror: power remote heated manual folding side-view door mirrors
- Spoiler: rear lip spoiler
- Door Handles: body-coloured
- Front And Rear Bumpers: body-coloured front and rear bumpers
- Front License Plate Bracket: front license plate bracket
- Body Material: galvanized steel/aluminum body material
- Roof Rack: rails only
- Body Side Cladding: black bodyside cladding
- Grille: grille with chrome bar

Convenience Features:

- Air Conditioning automatic dual-zone front air conditioning
- Air Filter: air filter
- Rear Air Conditioning: rear air conditioning with separate controls
- Voice Activated A/C: voice activated air conditioning
- Cruise Control: cruise control with steering wheel controls
- Trunk/Hatch/Door Remote Release: power cargo access remote release
- Power Windows: power windows with driver and passenger 1-touch down
- 1/4 Vent Rear Windows: power rearmost windows
- Remote Keyless Entry: keyfob (all doors) remote keyless entry
- Illuminated Entry: illuminated entry
- Integrated Key Remote: integrated key/remote
- Auto Locking: auto-locking doors
- Passive Entry: Intelligent Access proximity key
- Trunk FOB Controls: keyfob trunk/hatch/door release
- Remote Engine Start: remote engine start - smart device only (subscription required)
- Steering Wheel: steering wheel with manual tilting, manual telescoping
- Day-Night Rearview Mirror: day-night rearview mirror
- Driver and Passenger Vanity Mirror: illuminated auxiliary driver and passenger-side visor mirrors
- Emergency SOS: SYNC 3 911 Assist emergency communication system
- Front Cupholder: front and rear cupholders
- Floor Console: full floor console with covered box
- Overhead Console: mini overhead console with storage
- Glove Box: locking glove box
- Driver Door Bin: driver and passenger door bins
- Rear Door Bins: rear door bins
- Seatback Storage Pockets: 2 seatback storage pockets
- Driver Footrest: driver's footrest
- Retained Accessory Power: retained accessory power
- Power Accessory Outlet: 4 12V DC power outlets

Entertainment Features:

- radio SiriusXM AM/FM/Satellite with seek-scan
- Voice Activated Radio: voice activated radio
- Speed Sensitive Volume: speed-sensitive volume
- Steering Wheel Radio Controls: steering-wheel mounted audio controls
- Speakers: 6 speakers
- Internet Access: FordPass Connect 4G internet access
- 1st Row LCD: 2 1st row LCD monitor
- Wireless Connectivity: wireless phone connectivity
- Antenna: integrated roof antenna

Lighting, Visibility and Instrumentation Features:

- Headlamp Type delay-off aero-composite LED low/high beam headlamps
- Auto-Dimming Headlights: Ford Co-Pilot360 - Auto High Beam auto high-beam headlights
- Front Wipers: variable intermittent speed-sensitive wipers wipers
- Rear Window wiper: fixed interval rear window wiper with heating wiper park

Rear Window Defroster: rear window defroster
Tinted Windows: deep-tinted windows
Dome Light: dome light with fade
Front Reading Lights: front and rear reading lights
Ignition Switch: ignition switch light
Variable IP Lighting: variable instrument panel lighting
Display Type: analog appearance
Tachometer: tachometer
Compass: compass
Exterior Temp: outside-temperature display
Low Tire Pressure Warning: tire specific low-tire-pressure warning
Park Distance Control: Reverse Sensing System rear parking sensors
Trip Computer: trip computer
Trip Odometer: trip odometer
Lane Departure Warning: lane departure
Blind Spot Sensor: blind spot
Front Pedestrian Braking: pedestrian detection
Following Distance Indicator: following distance alert
Forward Collision Alert: forward collision
Water Temp Gauge: water temp. gauge
Oil Level Gauge: oil level gauge
Clock: in-radio display clock
Systems Monitor: systems monitor
Check Control: redundant digital speedometer
Rear Vision Camera: rear vision camera
Oil Pressure Warning: oil-pressure warning
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Ignition Disable: SecuriLock immobilizer
Security System: security system

Panic Alarm: panic alarm
Electronic Stability: AdvanceTrac w/Roll Stability Control electronic stability stability control with anti-roll
Traction Control: ABS and driveline traction control
Front and Rear Headrests: manual adjustable front head restraints
Rear Headrest Control: 2 rear head restraints
3rd Row Headrests: 2 manual adjustable third row head restraints

Seats And Trim:

Seating Capacity max. seating capacity of 6
Front Bucket Seats: front bucket seats
Front Heated Cushion: driver and passenger heated-cushions
Front Heated Seatback: driver and passenger heated-seatbacks
Number of Driver Seat Adjustments: 8-way driver and passenger seat adjustments
Reclining Driver Seat: power reclining driver and passenger seats
Driver Lumbar: power 2-way driver and passenger lumbar support
Driver Height Adjustment: power height-adjustable driver and passenger seats
Driver Fore/Aft: power driver and passenger fore/aft adjustment
Driver Cushion Tilt: power driver and passenger cushion tilt
Front Centre Armrest Storage: front centre armrest
Rear Seat Type: rear manual reclining captain seat
Rear Seat Fore/Aft: manual rear seat fore/aft adjustment
Rear Folding Position: rear seat fold-forward seatback
Rear Seat Mounted Armrests: rear seat mounted armrest
3rd Row Seat Type: fixed third row 50-50 bench seat
3rd Row Electric Control: fold into floor third row seat
Leather Upholstery: premium cloth front and rear seat upholstery
Door Trim Insert: cloth door panel trim
Headliner Material: full cloth headliner
Floor Covering: full carpet floor covering
Dashboard Console Insert, Door Panel Insert Combination: metal-look/piano black instrument panel insert, door panel insert, console insert
LeatherSteeringWheel: leather/metal-look steering wheel
Floor Mats: carpet front and rear floor mats
Interior Accents: chrome/metal-look interior accents
Cargo Space Trim: carpet cargo space
Trunk Lid: plastic trunk lid/rear cargo door
Cargo Tie Downs: cargo tie-downs
Cargo Light: cargo light
Concealed Cargo Storage: concealed cargo storage

Standard Engine:

Engine 300-hp, 2.3-liter I-4 (premium)

Standard Transmission:

Transmission 10-speed automatic w/ OD

Priority Public Safety LLC
659 Martin Duke Road
Van Alstyne, TX 75495
+1 9034829357
dkirby@priorityps.net

PRIORITY PUBLIC SAFETY
SALES SERVICE INSTALLATION

Estimate

ADDRESS
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

SHIP TO
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

ESTIMATE # 7125
DATE 11/01/2022
EXPIRATION DATE 11/30/2022

REP
TM

DATE	ACTIVITY	QTY	RATE	AMOUNT
	WE-ISFW50Z Whelen Inner Edge FST Series for Ford Police Interceptor Utility 2020+	1	820.00	820.00
	WE-ISDD Whelen DUO Red/White Inner Edge Modules	6	36.00	216.00
	WE-ISDE Whelen DUO Blue/White Inner Edge Modules	6	36.00	216.00
	WE-C399 Whelen Cencom Core WeCan X Control Module	1	1,200.00	1,200.00
	WE-CCTL7 Whelen New! Includes 3 Section Control Head and 21 Push-Buttons, 4-Position Slide Switch, Microphone with Extension Cable	1	0.00	0.00
	WE-C399K4 Whelen 2020 Ford Interceptor Utility Gateway Installation Kit for use WITHOUT Ford 61B Factory Option	1	0.00	0.00
	WE-SA315P Whelen 100 Watt Speaker	1	260.00	260.00
	WE-SAK1 Whelen Universal L Speaker bracket	1	35.50	35.50
	WE-IS508 Whelen New! Ford Police Interceptor Utility, 2020+ Upper Rear Housing for Eight or Ten Modules, No Charge When Ordered with Inner Edge Tray	1	0.00	0.00
	WE-ITRAYW10 Whelen New! 10 Lamp Tray, WeCan®, Choose 10 SOLO™, DUO™ or TRIO™	1	945.00	945.00

DATE	ACTIVITY	QTY	RATE	AMOUNT
	Lightheads and Vehicle Specific Housing and Mount, For Use in Sedans Only			
	WE-ISDK Whelen Inner Edge DUO module Red/Amber	5	36.00	180.00
	WE-ISDM Whelen Inner Edge DUO Module Blue/Amber	5	36.00	180.00
	WE-P46SLC Whelen Par-46 Super LED Spot Light 12v	1	165.00	165.00
	WE-AVC23RBC Whelen Avenger Trio Red/Blue/White - mounted in side cargo windows	2	365.00	730.00
	WE-I3JC Whelen ION Red/Blue/White with White Override Universal Mount LED	2	160.00	320.00
	WE-TLI2J Whelen DUO Thin ION Red/Blue - mounted on rear hatch, visible with lift gate open	2	120.00	240.00
	GR-5344 Go Rhino Center section push bumper for 2020+ Ford Interceptor Utility	1	420.00	420.00
	GJ-7170-0822-02 GJ-7170-0822-02 2020+ Ford Police Interceptor® Utility Full Depth Console Kit with Printer Insert, Side Mount, Armrest, Cup Holder, and Mongoose®- 9" Locking Slide Arm with Short Clevis	1	999.19	999.19
	WE-SSFPOS Whelen Universal Headlight Flasher	1	65.00	65.00
	WE-SSF5150D Whelen Taillight flasher with five flash patterns	1	85.00	85.00
	HAV-DS-PAN-1112-2 Havis Docking Station with Dual Pass-Through Antenna Connections for Panasonic TOUGHBOOK 33, 2-in-1 Laptop with Power Supply	1	1,447.26	1,447.26
	WE-WIONG Whelen Multimount ION Green LEDs - rear window and in side cargo windows Use separate button on control head	4	113.40	453.60
	SHOP SUPPLIES Truck Vault Command Cargo Cabinet	1	4,500.00	4,500.00
	Shipping and Handling Shipping and Handling	1	300.00	300.00
	SHOP SUPPLIES Shop supplies, misc. connectors, tape, lime, nuts, bolts	1	150.00	150.00

DATE	ACTIVITY	QTY	RATE	AMOUNT
	WIRE-HAR Custom Wiring Harness made to order	1	150.00	150.00
	LABOR Labor to install listed equipment and customer supplied radio (dual head), radar and camera system	40	65.00	2,600.00

Thank you for doing business with us.

SUBTOTAL	16,677.55
TAX	0.00
TOTAL	**$16,677.55**

Accepted By

Accepted Date

Priority Public Safety LLC
659 Martin Duke Road
Van Alstyne, TX 75495
+1 9034829357
dkirby@priorityps.net

PRIORITY PUBLIC SAFETY
SALES SERVICE INSTALLATION

Estimate

ADDRESS
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

SHIP TO
Parker Police Department
5700 E Parker Road
Parker, TX 75002 USA

ESTIMATE # 7138
DATE 11/07/2022
EXPIRATION DATE 12/06/2022

REP
TM

DATE	ACTIVITY	QTY	RATE	AMOUNT
	Message Carry over equipment from retiring unit to be installed in former command unit. Everything that can be used will be and the rest shipped back loose.	1	0.00	0.00
	PG-PVS1826T15AOSB PG-PVS1826T15AOSB Includes: Full Partition, Transport Seat, Pair Window Bars, Recessed Panel, Lower Extension Panels, Poly Center Divider,Poly Window Cargo Barrier, VIPER™ Shield, Door Panels, and Outboard Seat BeltsDual Compartments, Pro-Cell, Full Partition W/ Outboard Seat Belts	1	5,420.22	5,420.22
	LABOR Labor	1	1,500.00	1,500.00
	WIRE-HAR Custom Wiring Harness made to order	1	125.00	125.00
	SHOP SUPPLIES Shop supplies, misc. connectors, tape, lime, nuts, bolts	1	125.00	125.00
	WE-PROGRAM1 Scan lock programmer	1	175.00	175.00

Thank you for doing business with us.

SUBTOTAL	7,345.22
TAX	0.00
TOTAL	**$7,345.22**

Unused item refund or exchange within 14 days. Receipt and original packaging required. EXCEPT special order items, these cannot be returned. | Like us on Facebook! | Used items no returns.

Accepted By

Accepted Date

Unused item refund or exchange within 14 days. Receipt and original packaging required. EXCEPT special order items, these cannot be returned. | Like us on Facebook! | Used items no returns.

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council/Administration
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey for City Administrator Olson
Estimated Cost:	Date Prepared:	November 11, 2022
Exhibits:	• Proposed Ordinance	

AGENDA SUBJECT

DISCUSSION AND/OR ANY APPROPRIATE ACTION ON ORDINANCE NO. 832 AMENDING ORDINANCE NOS. 770 AND 498 REGARDING POLICE DEPARTMENT OPERATIONS AND APPOINTMENT OF A PUBLIC SAFETY COMMITTEE.

SUMMARY

Please review information provided.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:		Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

ORDINANCE NO. 832
(Police Department Operations)
(Amending Ordinance Nos. 770 & 498)

AN ORDINANCE OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS, AMENDING ORDINANCE NUMBERS 770 AND 498, POLICE DEPARTMENT OPERATIONS; PROVIDING FOR REPEALER; PROVIDING FOR SEVERABILITY; FINDING THAT THE MEETING AT WHICH THIS ORDINANCE IS PASSED WAS NOTICED AND IS OPEN TO THE PUBLIC AS REQUIRED BY LAW; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Ordinance No. 498 providing for Police Department Operations was adopted by the City Council of the City of Parker on March 13, 2001, and;

WHEREAS, Ordinance No. 770 which amended Ordinance No. 498 was adopted by the City Council of the City of Parker on May 21, 2019; and

WHEREAS, Ordinance No. 498 and any subsequent amendments are codified by reference in Section 33.02 of the City of Parker Code of Ordinances; and

WHEREAS, the City Council of the City of Parker, Texas finds it is in the public interest to make certain amendments to Ordinance Numbers 770 and 498 as detailed herein;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS:

Section 1. The findings set forth in the preamble of this Ordinance are incorporated by reference into the body of this Ordinance as if fully set forth herein.

Section 2. The second paragraph of Section I, entitled "Chief of Police, Director of Police Department," on Exhibit A to Ordinance 770 shall be deleted in its entirety and replaced with the following:

> The Chief of Police shall have immediate direction and control of the Police Department subject to the supervision of the Public Safety Committee and also subject to such rules, regulations, and orders as the Public Safety Committee and/or City Council may prescribe not inconsistent with the Ordinances of the City. The Chief of Police shall promulgate all policies governing the conduct of the Department which shall, in addition to applicable laws, provisions, and ordinances constitute the rules of the administration and conduct of the Department. The Public Safety Committee shall consist of the Mayor, Mayor Pro Tem, and another councilmember to be appointed by and serve at the pleasure of the Council.

Section 3. All other provisions of Ordinance No. 498, as amended by Ordinance No. 770 shall remain in full force and effect. To the extent provisions of other Ordinances of the City of Parker are in conflict with this Ordinance, said provisions are hereby repealed only to the extent of the conflict. All other provisions shall remain in full force and effect.

Proposed

Section 4. It is the intent of the City Council that each sentence, paragraph, subdivision, clause, phrase, and section of this Ordinance be deemed severable and, should any such sentence, paragraph, subdivision, clause, phrase, or section be declared invalid or unconstitutional for any reason, such declaration of invalidity or unconstitutionality shall not be construed to affect the validity of those provisions of the Ordinance left in effect.

Section 5. It is hereby officially found and determined that the meeting at which this Ordinance is passed is open to the public and that public notice of the time, place, and purpose of said meeting was given as required by law.

Section 6. This Ordinance shall take effect immediately upon passage and approval.

PASSED AND APPROVED BY THE CITY COUNCIL OF PARKER, COLLIN COUNTY, TEXAS, THIS 15TH DAY OF NOVEMBER, 2022.

_____
Lee Pettle, Mayor

ATTEST:

_____
Patti Scott Grey, City Secretary

APPROVED AS TO LEGAL FORM:

_____
Larence M. Lansford, III, City Attorney

Proposed

ORDINANCE NO. 770
{Police Department Operations}

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF PARKER, TEXAS, AMENDING ORDINANCE NO. 498, POLICE DEPARTMENT OPERATIONS; PROVIDING FOR REPEALER; PROVIDING FOR SEVERABILITY; PROVIDING FOR AN EFFECTIVE DATE; FINDING AND DETERMINING THAT THE MEETING AT WHICH THIS ORDINANCE IS PASSED WAS NOTICED AND IS OPEN TO THE PUBLIC AS REQUIRED BY LAW.

WHERAS, Ordinance No. 498 providing for Police Department Operations was adopted by the City Council of the City of Parker on March 13, 2001; and,

WHEREAS, Ordinance No. 498 and any subsequent amendments are codified in Section 33.02 of the City of Parker Code of Ordinances; and,

WHEREAS, the City Council of the City of Parker, Texas wishes to make certain amendments to Ordinance No. 498 in the best interest of the City of Parker, Texas

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PARKER, TEXAS:

SECTION 1. AMENDMENT: Ordinance No. 498 shall be amended as indicated in Exhibit A attached hereto and incorporated fully herein by reference.

SECTION 4. REPEALER CLAUSE: That all provisions of the Ordinances of the City of Parker in conflict with the provision of this Ordinance be, and the same are hereby, repealed, and all other provisions of the Ordinances of the City of Parker not in conflict with the provisions of this Ordinance shall remain in full force and effect.

SECTION 5. SEVERABILITY CLAUSE: It is the intent of the City Council that each sentence, paragraph, subdivision, clause, phrase or section of this Ordinance be deemed severable and, should any such sentence, paragraph, subdivision, clause, phrase or section be declared invalid or unconstitutional for any reason, such declaration of invalidity or unconstitutionality shall not be construed to affect the validity of those provision of the Ordinance left standing.

SECTION 6. EFFECTIVE DATE: This Ordinance shall take effect immediately from its passage and publication of the caption as the law in such cases provides.

SECTION 7. That it is hereby officially found and determined that the meeting at which this ordinance is passed is open to the public and that public notice of the time, place, and purpose of said meeting was given as required by law.

ADOPTED on this the 21st day of May, 2019.

CITY OF PARKER, TEXAS

BY: _____
LEE PETTLE, MAYOR

ATTEST:

BY: _____
PATTI SCOTT GREY, CITY SECRETARY

APPROVED AS TO FORM
AND CONTENT:

BY: _____
BRANDON S. SHELBY,
CITY ATTORNEY

Exhibit A

ORDINANCE NO. 498

AN ORDINANCE OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS PROVIDING FOR THE RULES AND REGULATIONS FOR THE OPERATION OF THE CITY OF PARKER POLICE DEPARTMENT, THE POWERS AND DUTY OF PEACE OFFICERS, THE RATIFICATION OF THE ESTABLISHMENT OF THE POLICE DEPARTMENT; PROVIDING A SEVERABILITY CLAUSE; PROVIDING AN EMERGENCY CLAUSE AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council of the City of Parker, Texas, desires in this Ordinance to set forth the powers and duties for Peace Officers of the City of Parker Police Department, and to provide for the health, welfare, and safety of the citizens of Parker, Texas;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PARKER, COLLIN COUNTY, TEXAS AS FOLLOWS:

SECTION I. CHIEF OF POLICE, DIRECTOR OF POLICE DEPARTMENT.

The director of the Police Department shall be the Chief of Police. The Police Department shall be composed of a Chief of Police and such other officers and employees as the City Council may provide.

The Chief of Police shall have immediate direction and control of the Police Department, subject to the supervision of the City Administrator and also subject to such rules, regulations, and orders as the City Administrator and/or City Council may prescribe not inconsistent with the Ordinances of the City. The Chief of Police shall promulgate all policies governing the conduct of the Department which shall, in addition to applicable laws and provisions, ordinances, constitute the rules of the administration and conduct of the Department.

The selection, appointment and promotion of Peace Officers shall be on merit basis.

SECTION 2. AUTHORITY OF PEACE OFFICERS

The Peace Officers constituting the Police Department of the City of Parker shall be and they are hereby vested, with all the powers and authority given to them as Peace Officers under the laws of the State of Texas in taking cognizance of, and enforcing the laws of the State and the ordinances and regulations of the City within the limits of the City, and it shall be the duty of each such Peace Officer to use their best endeavors to:

A. Prevent the commission within the City of offenses against the laws of the State and against the ordinances and regulations of the City.
B. To observe and enforce all such laws, ordinances and regulations.
C. To detect and arrest offenders against the same to preserve the good order of the City.
D. To secure the inhabitants thereof from violence, and the property therein from injury.

Such Peace Officers shall execute any warrant for arrest, or any writ, subpoenas or other process that may be issued by a duly constituted authority. No Peace Officer shall receive any fee or other compensation for any service rendered in the performance of their duty other than the salary paid to them by the City, nor shall they receive a fee as a witness in any case arising under the criminal laws of this State or under the ordinances or regulations of the City and prosecuted in the Municipal Court of the City or in any Criminal Court in Collin County.

SECTION 3. DISCIPLINE OF EMPLOYEES – HEARING.

The Chief of Police shall have the right to establish disciplinary policies and procedures for any of the Peace Officers or employees who may be under the Chief's jurisdiction and control. Discipline and appeals of Police Department employees shall be conducted according to the City's policies and procedures applicable to all other employees.

SECTION 4. SEVERABILITY.

If any word, phrase, paragraph, section or portion of this ordinance is held to be illegal, invalid or unenforceable, the legality, validity and enforceability of the remaining portions of the ordinance shall not be affected thereby, and each such illegal, invalid or unenforceable word, phrase, paragraph, section or portion shall not affect the ordinance as a whole. The creation of the Police Department at its inception in the City of Parker is ratified and approved. Any ordinances in conflict with this Ordinance are repealed to the extent that they are in conflict with the terms and conditions of this Ordinance.

SECTION 5. EMERGENCY.

The need for expansion of the City of Parker Police Department to provide for the needs of the citizens of the City of Parker to promote health, safety, and welfare of the public, creates an urgency and emergency that necessitates that this Ordinance become effective immediately from and after its date of passage and the publication of its caption as the law in such cases provides, and it is accordingly so ordained.

SECTION 6. EFFECTIVE DATE.

This Ordinance shall take effect immediately from and after its passage and the publication of the caption, as the law and charter in such cases provide.

ADOPTED by the City Council of the City of Parker, Texas, on this 21st day of May, 20 19.

CITY OF PARKER COLLIN COUNTY, TEXAS

APPROVED:

Mayor

ATTEST:

City Secretary

APPROVED AS TO FORM:

City Attorney

Council Agenda Item

Budget Account Code:	Meeting Date:	See above.
Budgeted Amount:	Department/ Requestor:	Council
Fund Balance-before expenditure:	Prepared by:	ACA/CS Scott Grey
Estimated Cost:	Date Prepared:	NOVEMBER 10, 2022
Exhibits:	**None**	

AGENDA SUBJECT

UPDATE(S):

ANY COMMITTEE UPDATES, AS NEEDED.

MONTHLY/QUARTERLY REPORTS

- October 2022 - Building Permit/Code Report
- Fire 3rd Qtr. Report 2022
- October 2022 – Republic Services Inc., dba Allied Waste Services of Plan
- October 2022 – Website (PIWIK) Report

ACCEPTANCE OF DONATION(S) FOR POLICE, FIRE, AND CITY STAFF FOR THE RECORD (Each valued at between $0 - $500)

Chip and Linda Justice donated two (2) dozen Tiff's Treat Cookies estimated value is $40.00.

SUMMARY

Please review information provided.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

Council Agenda Item

Budget Account Code:		Meeting Date:	See above.
Budgeted Amount:		Department/ Requestor:	Council
Fund Balance-before expenditure:		Prepared by:	ACA/CS Scott Grey
Estimated Cost:		Date Prepared:	November 10, 2022
Exhibits:	Future Agenda Items		

AGENDA SUBJECT

FUTURE AGENDA ITEMS

SUMMARY

Please review information provided.

POSSIBLE ACTION

City Council may direct staff to take appropriate action.

Inter – Office Use

Approved by:	Enter Text Here		
Department Head/ Requestor:	Patti Scott Grey	Date:	11/10/2022
City Attorney:	Trey Lansford	Date:	11/10/2022
City Administrator:	Luke B. Olson	Date:	11/11/2022

FUTURE AGENDA ITEMS

AGENDA DATE	ITEM DESCRIPTION	CONTACT	Notes
2022			
~~Feb(Mar), May (July), Aug,~~ Nov	Fire Department Quarterly Report	Sheff/Miller	3rd Qtr 2022 1115 CC Agenda
~~Feb(Mar), May (July), Aug,~~ Nov	Investment Quarterly Report	Savage	3rd Qtr 2022 1018 CC Agenda
	Council Committee Updates	Council	2022 0126 Any Committees updates, as needed
Tentatively - Dec 6, 2022	Water Rate Analysis - Ongoing	Olson/Machado	0810 Ord739 2016 Water Rate Amendments for 2016-2020; Waiting on numbers; Finalizing
Tentatively - Dec 6, 2022	Fences in Drainage Easements	Lynch	Requested @ 2022 0802 CC Mtg
Tentatively - Dec 6, 2022	CIP	Lynch	MLP added 2022 0713; 2022 0720 MLP - after budget; Workshop
Tentatively - TBD	Civic Plus Contract?	Pettle	Work in Progress; CALO - no contract - reviewing pricing options
Tentatively - 2022	Water Rate/Usage Education	Lynch	2022 0906 CC Mtg
Tentatively - 2022	Oncor & Frontier Franchise (All?) - Review Ongoing	Savage	2021 0615 added - When due
Tentatively - 2022	Workshop - Animal Control Procedures - within contract	Mayor	Added 2022 1012 Agenda Meeting
Tentatively - 2022	Workshop - Facility	Mayor	Added 2022 1012 After Agenda Meeting
Tentatively - December 6, 2022	Cancel/Reschedule 2022 1220 due to Christmas Holiday?	Mayor	Check w/Mayor Pettle
Tentatively - December 6, 2022	Cancel/Reschedule 2023 0103 due to New Year's Holiday?	Mayor	Check w/Mayor Pettle
Tentatively - February 7, 2023	May 6, 2023 - Council Term Length	Mayor/Lansford	Added 2022 10/18 after Workshop
February 17, 2023	Facility Bond & Sales Tax	Council	Last Day to Order GE - Friday, Feb. 17, 2023