HOWELL COUNTY, MISSOURI

Multijurisdictional Hazard Mitigation Plan

Prepared by: South Central Ozark Council of Governments
4407 County Road 2340; PO Box 100
Pomona, Missouri 65789
Phone: 417.256.4226

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Howell County, Missouri Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name	Title	Department	Jurisdiction/Agency /Organization
Mark Collins	Presiding Commissioner	County	Howell County
Linda Bunch	Mayor	City	Brandsville
Linda Higgins	Clerk	City	Mountain View
Michael McMahon	Project Specialist	City	West Plains
Beverly Hicks	City Administrator	City	Willow Springs
Aaron Sydow	Superintendent	School	Fairview R-XI
Wayne Stewart	Superintendent	School	Glenwood R-VIII
Marvin Hatley	Superintendent	School	Howell Valley R-I
John Dern	Superintendent	School	Junction Hill C-12
Melonie Bunn	Superintendent	School	Richards R-V
Lori Wilson	Superintendent	School	West Plains R-VII
Bill Hall	Superintendent	School	Willow Springs R-IV
Crockett Oaks	Director of Facilities	College	MSU-West Plains

Based upon the risk assessment, the MPC updated goals for reducing risk from hazards. The goals are:

(1) Protect the lives and property of all citizens of Howell County;
(2) Preserve functioning of civil government during natural disasters; and
(3) Maintain economic activities essential to the survival and recovery from natural disasters.

To advance the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. The MPC developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more.

Stakeholder Representatives

Name	Title	Department	Jurisdiction/Agency/ Organization
Mike Coldiron	EMD	County	Howell County
Daniel Franks	Assessor/911	County	Howell County
Kent Edge	SEMA Regional Representative	State	State Emergency MGMT
Jessica Paulk	RHSOC Coordinator	Regional	Regional Planning Agency
Dustin Harrison	Building Official	City	West Plains
Evan Kinder	Planning Technician	City	West Plains
Brian Hogan	Chief	Police	Willow Springs
Brent Campbell	Sheriff	County	Howell County
Billy Sexton	Southern Commissioner	County	Howell County
Calvin Wood	Northern Commissioner	County	Howell County
Kelly Waggoner	Clerk	County	Howell County
Lucas Brown	Principal	School	Glenwood
Wes Davis	Asst. Superintendent	School	West Plains

EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Howell County and participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved on [insert date]. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process.

- **Howell County**
- **City of Brandsville**
- **City of Mountain View**
- **City of West Plains**
- **City of Willow Springs**
- **Fairview R-XI**
- **Glenwood R-VIII**
- **Howell Valley R-I**
- **Junction Hill C-12**
- **Missouri State Univ. - West Plains**
- **Richards R-V**
- **West Plains R-VII**
- **Willow Springs R-IV**

Howell County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on June 20, 2017 (hereafter referred to as the *2017 Hazard Mitigation Plan*). This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology in accordance with FEMA guidance, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Howell County and the participating jurisdictions within. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Howell County and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact.

Based upon the risk assessment, the MPC updated goals for reducing risk from hazards. The goals are listed below:

(1) Protect the lives and property of all citizens of Howell County;

(2) Preserve functioning of civil government during natural disasters; and

(3) Maintain economic activities essential to the survival and recovery from natural disasters.

To advance the identified goals, the MPC developed recommended mitigation actions, as summarized in the table on the following pages. The MPC developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more. These additional details are provided in Chapter 4.

Table I. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Howell 1	Make improvements at various low water crossings throughout the county where incidents of flash flooding become hazardous. Improvements could include barricades, warning lights, or crossing replacement	Howell County	20 - HIGH	Goal 1	Flooding (Flash and River)	X		
Howell 3	Create a better methodology for identifying, locating, and supporting vulnerable populations in the county in the event of disaster	Howell County	17 - MED	Goal 1	All natural hazards	X	X	
2017E	Construct a 361-design tornado saferoom in the Southern Hills Shopping District	City of West Plains	19 - HIGH	Goal 1	Tornado	X		
2017D	Buy out flood prone properties in the city to reduce the devastating impacts of flash flooding	City of West Plains	21 - HIGH	Goal 1	Flooding	X	X	
2017F	Implement the local stormwater management plan which identifies the construction of flood control infrastructure such as retention basins in the City	City of West Plains	21 - HIGH	Goal 1	Flooding	X	X	X
Willow 3	Purchase and install outdoor warning sirens in the area of the south junction/industrial park	City of Willow Springs	16 - MED	Goal 1	Tornado	X		
MSU 1	Work with city and county emergency management agencies and the local Red Cross to establish strategies for short term mass-care sheltering utilizing available university facilities	Missouri State University-West Plains	17 - MED	Goal 1	Various	X		
MSU 3	Implement flood protections measures at the Shoe Loft Dormitory, Greater Ozarks Center For Advanced Manufacturing Training, and other flood-prone sites.	Missouri State University-West Plains	20 - HIGH	Goal 1	Flooding	X		X

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Junction Hill 1	Construct a 361-design tornado saferoom on the school campus	Junction Hill School District	21 - HIGH	Goal 1	Tornado	X		
WP Elem 1	Construct a 361-design tornado saferoom on the WP Elementary campus	West Plains School District	21 - HIGH	Goal 1	Tornado	X		
Willow School 2	Work with city and county emergency management agencies and the local Red Cross to establish strategies for short term mass-care sheltering utilizing available school facilities	Willow Springs School District	14 - LOW	Goal 1	Various	X	X	
Howell2	Make general improvements to the existing framework for notification of severe weather events, primarily tornadic storms. Explore new avenues to disseminate warnings	Howell County	18 - HIGH	Goal 2	Various	X	X	
Brandsville 3	Purchase back up power generator for installation at the city's only water well	City of Brandsville	21 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X	X	
MV2022	Purchase back up power generators for installation at the city's police department (EOC), municipal water well and wastewater treatment facility	City of Mountain View	20 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X	X	
2017C	Construct a railroad overpass on Independence Dr. (US160) to ensure proper emergency access in the event of a disaster	City of West Plains	17 - MED	Goal 2	Flooding	X	X	X
MSU 2	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs	Missouri State University-West Plains	14 - LOW	Goal 2	Various	X		
Fairview2	Purchase a backup power generator for use at the school, in the event of power outage	Fairview School District	19 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X		
Glenwood3	Purchase a backup power generator for use at the school, in the event of power outage	Glenwood School District	20 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X	X	
Glenwood1	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs	Glenwood School District	16 - MED	Goal 2	Various	X		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Howell Valley 1	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs	Howell Valley School District	19 - HIGH	Goal 2	Various	X	X	
Howell Valley 2	Purchase a backup power generator for use at the school, in the event of power outage	Howell Valley School District	19 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X		
Richards2	Purchase a backup power generator for use at the school, in the event of power outage	Richards School District	15 - MED	Goal 2	Severe T-Storm; Ice Storm; Tornado	X		
WP School 1	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs	West Plains School District	17 – MED	Goal 2	Various	X		
WP School 4	Purchase a more powerful and reliable generator	West Plains School District	16 - MED	Goal 2	Severe T-Storm; Ice Storm; Tornado	X		
WillowSchool4	Purchase a backup power generator for use at the school, in the event of power outage	Willow Springs School District	19 - HIGH	Goal 2	Severe T-Storm; Ice Storm; Tornado	X	X	
2017G	Bury power lines throughout the city to protect vulnerable populations and critical facilities from loss of power/operations	City of West Plains	15-LOW	Goal 3	Various	X	X	
2022A	The city will attempt to improve floodplain management by identification of map amendments/updates	City of West Plains	15-LOW	Goal 3	Flooding (Flash and River)			X
Willow 1	Elevate Welch Drive west of the new bridge constructed in 2012	City of Willow Springs	21 - HIGH	Goal 3	Flooding (Flash and River)	X		
Willow 2	Purchase and install a backup generator at the emergency operations center	City of Willow Springs	18 - HIGH	Goal 3	Various	X		
Willow 4	Elevate the roadway from West Street to the Catholic Church, or construct other flood mitigation measures to limit the impacts of flash flooding	City of Willow Springs	15 - LOW	Goal 3	Flooding (Flash and River)	X	X	X

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Willow 5	The city will attempt to improve floodplain management by identification of map amendments/updates	City of Willow Springs	15 – LOW	Goal 3	Flooding (Flash and River)			X
Howell 4	Continuously identify funding sources to update buildings and infrastructure to ensure that community assets are resilient to natural disaster	Howell County	15 - LOW	Goal 3	Various	X	X	

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools/special districts. The documentation of each adoption is included in Appendix D, and a model resolution is included below. The jurisdictions listed in the Executive Summary participated in the development of this plan and have adopted the multi-jurisdictional plan.

(LOCAL GOVERNING BODY/SCHOOL DISTRICT), Missouri RESOLUTION NO. ___

A RESOLUTION OF THE (LOCAL GOVERNING BODY /SCHOOL DISTRICT) ADOPTING THE (PLAN NAME)

WHEREAS the (local governing body/school district) recognizes the threat that natural hazards pose to people and property within the (local governing body/school district); and

WHEREAS the (local governing body/school district) has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the (plan name), hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the (local governing body/school district) from the impacts of future hazards and disasters; and

WHEREAS the (local governing body) recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the (local governing body/school district) will endeavor to integrate the Plan into the comprehensive planning process; and

WHEREAS adoption by the (local governing body/school district) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan.

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT/SCHOOL DISTRICT), in the State of Missouri, THAT:

In accordance with (local rule for adopting resolutions), the (local governing body/school district) adopts the final FEMA-approved Plan.

ADOPTED by a vote of in favor and_____against, and_____abstaining, this_____day of _____, _____.

By (Sig):
Print name:

ATTEST:
By (Sig.):
Print name:

APPROVED AS TO FORM:
By (Sig.):
Print name:

1 INTRODUCTION AND PLANNING PROCESS

1.1 PURPOSE

Hazard Mitigation is the process of preparing for and taking action in order to reduce the long- term risk of natural disasters to financial and human consequences. Mitigation actions may be implemented prior to, during, or after a hazard event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (http://www.fema.gov/what-mitigation).

By participating in the planning process and meeting the necessary requirements to do so, communities, school districts, and other special districts become eligible to apply for mitigation grant funding. FEMA has implemented the various hazard mitigation provisions through the Code of Federal Regulations (CFR) at 44 CFR Part 201. The CFR provisions set forth the mitigation plan requirements for local and tribal governments as a condition of receiving FEMA hazard mitigation assistance. Local governments, schools, or other publicly funded districts that do not participate or adopt a hazard mitigation plan will not be eligible to apply for grants as stated under 44 CFR §201.6. Section 322 of the Robert T. Stafford Relief and Emergency Assistance Act (P.L. 93-288), as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Tribes and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning.

1.2 BACKGROUND AND SCOPE

As required by 44 CFR §201.6(d)(3), a local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts and changes in priorities, and resubmit it for approval every five (5) years in order to continue to be eligible for mitigation project grant funding. The 2022 Howell County Multi-Jurisdictional Natural Hazard Mitigation Plan, from here on referred to as the Plan, is a revision of the previous five-year update approved by FEMA during 2017, which was the first five-year update of the original countywide hazard mitigation plan completed in 2007.

The Plan is a major rewrite of the 2017 Plan and reflects changes in priorities and development, and the continued commitment of local governments to mitigate the impact of natural hazards in Howell County. Local jurisdictions that participated in the 2017 Plan and are continuing participation in this 2022 Plan include:

- Howell County
- City of Brandsville
- City of Mountain View
- City of West Plains
- City of Willow Springs
- Fairview R-XI
- Glenwood R-VIII
- Howell Valley R-I
- Junction Hill C-12
- Missouri State Univ. - West Plains
- Richards R-V
- West Plains R-VII
- Willow Springs R-IV

All jurisdictions received letter and email communications notifying representatives of upcoming meetings and participation requirements. Jurisdictions listed above were represented during the planning process and met the minimum participation requirements.

The local mitigation plan is the representation of the jurisdictions' commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Information in the Plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

1.3 PLAN ORGANIZATION

The Plan is organized into five chapters. The 2017 Plan included a chapter dedicated to local jurisdiction capabilities. This information has been incorporated into the Planning Area Profile and Capabilities Chapter. The format of the Plan was changed to conform to the local hazard mitigation plan outline template released by the Missouri State Emergency Management Agency (SEMA) in September, 2017. The Plan chapters include:

- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

Table 1.1 below summarizes the changes made in the Plan by chapter:

Table 1.1. Changes Made in Plan Update

Plan Chapter	Summary of Changes Made
Introduction	• General Format Changes
Profile & Capabilities	• Added Geological and Karst features map • Critical features moved to Ch. 3 • Added table showing Unemployment, Poverty, education, and language percentages • Historic Sites and endangered species list moved to Ch. 3. • Added table showing FEMA HMA grants approved.
Risk Assessment	• General format updates • Expanded introduction section • Added Assets at Risk of exposure to current population and structures • Added Critical Facilities inventory of all included jurisdictions • Added inventory of parks, historical sites, and endangered species. • Added table for agricultural-related jobs and information and Major employers • Added Land Use Development section for development since previous plan and future land use expected. • Expanded Community profiles for each jurisdiction. • Added low-water crossing information
Mitigation Strategy	• Updated mitigation actions development process • Included actions eliminated and reason for removal • Updated progress made towards mitigation goals from earlier plan • Updated cost benefit review method using STAPLEE and simple scores • Discussed funding sources, lead agencies and status of continuing, revised and new actions
Plan Maintenance	• Updated the responsibilities for plan monitoring, evaluation, and implementation.

1.4 PLANNING PROCESS

44 CFR Requirement 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

For the update of the 2017 Howell County Hazard Mitigation Plan, the County and SEMA has contracted with the South Central Ozark Council of Governments (SCOCOG) and has participated fully in the update process. Once this plan receives final approval from the Federal Emergency Management Agency, Howell County, and the participating cities and school districts within will be eligible for future mitigation assistance from FEMA and will be able to more effectively carry out the identified mitigation activities in an effort to lessen the adverse impact of future natural disasters that take place in the county.

SCOCOG's role as contractor includes the following elements:

- Assist in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA),
- Ensure the updated plan meets the DMA requirements as established by federal regulations and follows the most current planning guidance of the Federal Emergency Management Agency (FEMA),
- Facilitate the entire plan development process,
- Identify the data that MPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in soliciting public input,
- Produce the draft and final plan update in a FEMA-approvable document, and Coordinate the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Howell County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to the County and analyzed jurisdictional vulnerability to these hazards. The MPC also directed the planner-in-charge to analyze the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. The planner-in-charge determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Flash flooding, winter storms, and tornadoes are among the hazards that historically have had the most significant impact.

Table 1.2. Jurisdictional Representatives of Howell County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Agency /Organization
Mark Collins	Presiding Commissioner	County	Howell County
Linda Bunch	Mayor	City	Brandsville
Linda Higgins	Clerk	City	Mountain View
Michael McMahon	Project Specialist	City	West Plains
Beverly Hicks	City Administrator	City	Willow Springs
Aaron Sydow	Superintendent	School	Fairview R-XI
Wayne Stewart	Superintendent	School	Glenwood R-VIII
Marvin Hatley	Superintendent	School	Howell Valley R-I
John Dern	Superintendent	School	Junction Hill C-12
Melonie Bunn	Superintendent	School	Richards R-V
Lori Wilson	Superintendent	School	West Plains R-VII
Bill Hall	Superintendent	School	Willow Springs R-IV
Crockett Oaks	Director of Facilities	College	MSU-West Plains

Table 1.3. below demonstrates the expertise of the Howell County MPC members in the six mitigation categories (Preventive Measures, Property Protection, Natural Resource Protection, Emergency Services, Structural Flood Control Projects and Public Information.

Table 1.3. MPC Capability with Six Mitigation Categories

Office	Preventive Measures	Structure and Infrastructure Projects		Natural Resource Protection	Public Information	Emergency Services
		Property Protection	Structural Flood Control Projects			
Presiding Commissioner	✓	✓	✓	✓	✓	
Police Chief/EMD	✓		✓			✓
Mayor	✓			✓		
EMD/Fire Chief	✓		✓			✓
Superintendent	✓	✓			✓	
Superintendent	✓	✓			✓	
Superintendent	✓	✓			✓	
Superintendent	✓	✓			✓	

1.4.1 Multi-Jurisdictional Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

The South Central Ozark Council of Governments, on behalf of Howell County, invited all incorporated cities, all school districts, and many non-profit entities located within the county to participate in the Howell County Hazard Mitigation Plan update planning meetings. FEMA accepts multi-jurisdictional plans which meet all the requirements of 44CFR §201.6(a)(3):

- The risk assessment must assess each jurisdiction's risk where they may vary from the risks facing the entire planning area.
- There must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.
- Each jurisdiction requesting approval of the plan must document that itself has formally adopted the plan.

DMA 2000 further requires that jurisdictions represented within a multi-jurisdictional hazard mitigation plan participate in the planning process in addition to formally adopting the completed plan. Each participating jurisdiction was required to meet planning participation requirements as defined by SCOCOG at the beginning of the update process. Minimum participation requirements were defined as follows:

Provide information to support the plan update through at least two of the following methods:

- Completion of jurisdiction questionnaire;
- Attendance at public meetings;
- Alternately scheduled meetings for data collection purposes;
- Email correspondence with SCOCOG staff for data collection purposes; and
- Formally adopt the hazard mitigation plan

SCOCOG was contracted by Howell County to revise and update the 2017 Hazard Mitigation Plan and coordinate planning efforts between the municipalities and school districts of the County. SCOCOG planning staff led the development of the plan update by forming the planning committee, calling and facilitating meetings, compiling data, composing and reviewing drafts, issuing public notices, and drafting correspondence. All of the jurisdictions listed as participants in the plan update met the minimum participation requirements as indicated in the following tables. Documentation of meeting attendance is included in *Appendix A: Planning Participation Documentation*.

Participating jurisdictions include Howell County (unincorporated), the incorporated cities of Brandsville, Mountain View, West Plains and Willow Springs, Missouri State University – West Plains, and the school districts of Fairview, Glenwood, Howell Valley, Junction Hill, Richards, West Plains and Willow Springs. In the 2017 iteration of the Howell County Hazard Mitigation Plan, all jurisdictions participated fully. Other jurisdictions which participated in the planning process as stakeholders, but are not seeking independent adoption and approval are: local police departments, electric cooperatives, emergency management agencies.

The Plan serves as a written document of the planning process. Active participation of local jurisdiction representatives and stakeholders in the hazard mitigation planning process is essential if the Plan is to have value. To be eligible for mitigation funding, local governments and school districts must adopt the FEMA-approved update of the Plan. The participation of the local government stakeholders in the planning process is considered critical to successful implementation of this plan. Each jurisdiction that is seeking approval for the plan must have its governing boy adopt the updated plan, regardless the degree of modifications. SCOCOG collaborated with the local governments in Howell County to assure participating in the planning process to the greatest extent possible and the development of the plan that represents the needs and interests of Howell County and its local jurisdictions.

The planning engagement took to the form of individual meetings with each of the participating jurisdictions, who reviewed findings from the updated Risk Assessment and completed a hazard mitigation data collection questionnaire (DCQ) that was developed in tandem with the Missouri SEMA planning outline template. This approach is different from previous plan updates, when county-wide planning meetings were held in an attempt to get input from all jurisdictions in one central location. From these meetings, goal refinement and potential mitigation actions were identified and MPC representatives were decided.

The public was engaged at two points during the development of the plan update. First, a public survey was posted on the SCOCOG website and advertised in the West Plains Daily Quill, the newspaper of widest circulation in the county. Second, the availability of the draft plan for review and comment was announced in the same newspaper in April of 2022. Documentation for both public engagement efforts and results of the public survey are included in Appendix C.

Table 1.4. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #2	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
Howell County	X	X	X	X
City of Brandsville	X	X	X	X
City of Mountain View	X	X	X	X
City of West Plains	X	X	X	X
City of Willow Springs	X	X	X	X
Fairview R-XI	X	X	X	X
Glenwood R-VIII	X	X	X	X
Howell Valley R-I	X	X	X	X
Junction Hill C-12	X	X	X	X
MSU—West Plains	X	X	X	X
Richards R-V	X	X	X	X
West Plains R-VII	X	X	X	X
Willow Springs R-IV	X	X	X	X

1.4.2 The Planning Steps

FEMA's Local Mitigation Planning Handbook (March 2013), Local Mitigation Plan Review Guide (October 2013), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 2013) were used as sources for development the Plan update process. The development of the plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance Programs. The 10-step process allows the Plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Migration Assistance Program. Table 1.5 shows how the CRS process aligns with the Nine Task Process outlined in the 2013 Local Mitigation Planning Handbook.

Table 1.5. County Mitigation Plan Update Process

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)
Step 1. Organize	Task 1: Determine the Planning Area and Resources
	Task 2: Build the Planning Team 44 CFR 201.6(c)(1)
Step 2. Involve the public	Task 3: Create an Outreach Strategy 44 CFR 201.6(b)(1)
Step 3. Coordinate	Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)
Step 4. Assess the hazard	Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)
Step 5. Assess the problem	
Step 6. Set goals	Task 6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)
Step 7. Review possible activities	
Step 8. Draft an action plan	
Step 9. Adopt the plan	Task 8: Review and Adopt the Plan
Step 10. Implement, evaluate, revise	Task 7: Keep the Plan Current
	Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)

Step 1: Organize the Planning Team
(Handbook Tasks 1, 2, and 4)

The Council of Governments planners began the plan update process by contacting local stakeholders that were identified as key officials who would be valuable to the update of the mitigation plan. County commissioners, city officials, and emergency management personnel were targeted as potential members of the MPC. During an introductory conference call in July 2021, the scope of the plan update was discussed, including planning participation requirements and general methodology. A timeline for completion the update was established and planning meetings were scheduled and given 'tentative' dates.

The Data Collection Questionnaires for the county's school districts and municipalities were distributed at the very beginning of the update process via email along with a follow up phone call to explain the procedure, the need for the data collection, how the data would be used, and to answer any questions the Superintendents may have had regarding the contents of the Data Collection Questionnaires. All participating jurisdictions were informed of an upcoming planning meeting throughout the county where SCOCOG planners would gather and review the questionnaire responses and help shore up any gaps in the data.

Table 1.6. Schedule of Planning Meetings

Meeting	Participation	Method	Date
Kick-off Meeting	9:00 a.m. • Prospective participants and stakeholders identified • Raising awareness for mitigation strategy/increase countywide resilience to natural hazards • Natural hazard vulnerability • Local plan participation • Project timeline	Teleconference	October 2021
Planning Meeting # 2	Jurisdictions represented: All, various times and locations • Review of 2017 Mitigation Goals, Objectives and Actions • Review of completed Jurisdictional Risk Assessment • Identification of new mitigation actions • STAPLEE Prioritization • Completion of Data Collections Questionnaire, identifying capabilities, assets, vulnerability	Various	3/1 – 4/15 2022
Howell County	Commissioners, Clerk, SCOCOG Planner	In Person	4/7/22
Brandsville	Mayor, Council, Clerk, SCOCOG Planner	In Person	4/15/22
Willow Springs	Mayor, Council, Clerk, SCOCOG Planner	Teleconference	3/25/22
West Plains	City Planner, Transportation Department, SCOCOG Planner	In Person	4/4/22
Mtn. View	Mayor, Council, Clerk, SCOCOG Planner	Teleconference	2/16/22
Fairview R-XI	Superintendent, Principal, SCOCOG Planner	Teleconference	3/1/22
Glenwood R-VIII	Superintendent, Principal, SCOCOG Planner	Teleconference	3/7/22
Howell Valley R-I	Superintendent, Principal, SCOCOG Planner	Teleconference	3/7/22
Junction Hill C-12	Superintendent, Principal, SCOCOG Planner	Teleconference	3/2/22
MSU—West Plains	Chancellor, Campus Services Director, SCOCOG Planner	Teleconference	3/7/22
Richards R-V	Superintendent, Principal, SCOCOG Planner	Teleconference	3/24/22
West Plains R-VII	Superintendent, Principal, SCOCOG Planner	Teleconference	3/25/22
Willow Springs R-IV	Superintendent, Principal, SCOCOG Planner	Teleconference	4/4/22

Step 2: Plan for Public Involvement
(Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

Options for soliciting public input on the Plan update were discussed at the Planning Kickoff Meeting held on October 21, 2021. SCOCOG staff explained the importance of public involvement during the planning process.

A plan to engage the public in the plan update process was developed in accordance with 44 CFR Requirement 201.6(b), ensuring the opportunity for the public to comment on the plan during the drafting stage and prior to FEMA approval. The consensus of the group was to (**1**) develop an online survey instrument which would be publicized in the West Plains Daily Quill and ran concurrent to the drafting of the plan update and (**2**) post the draft plan on the website of the South Central Ozark Council of Governments for public review and comment,

and announce its availability in the Standard Journal prior to the plan's submittal to the State Emergency Management Agency

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are many organizations that are 'regional' in nature whose interest's interface with hazard mitigation planning in Howell County. These groups were engaged via telephone calls and direct mail letters to invite interested parties to the October 21, 2021 planning meeting. The agencies and interest groups who were invited to take part in the hazard mitigation plan update are listed below:

- Red Cross
- Community Foundation of the Ozarks
- Shannon County Presiding Commissioner Jeff Cowen
- Oregon County Presiding Commissioner David Stubblefield
- Ozark County Presiding Commissioner John Turner Texas County EMD Jack Watson
- Howell County EMD Mike Coldiron
- Lanton Volunteer Fire Department
- Eleven Point Volunteer Fire Department
- Caulfield Volunteer Fire Department
- Missouri Department of Conservation
- Missouri Department of Transportation (Southeast District)

Integration of Other Data, Reports, Studies, and Plans

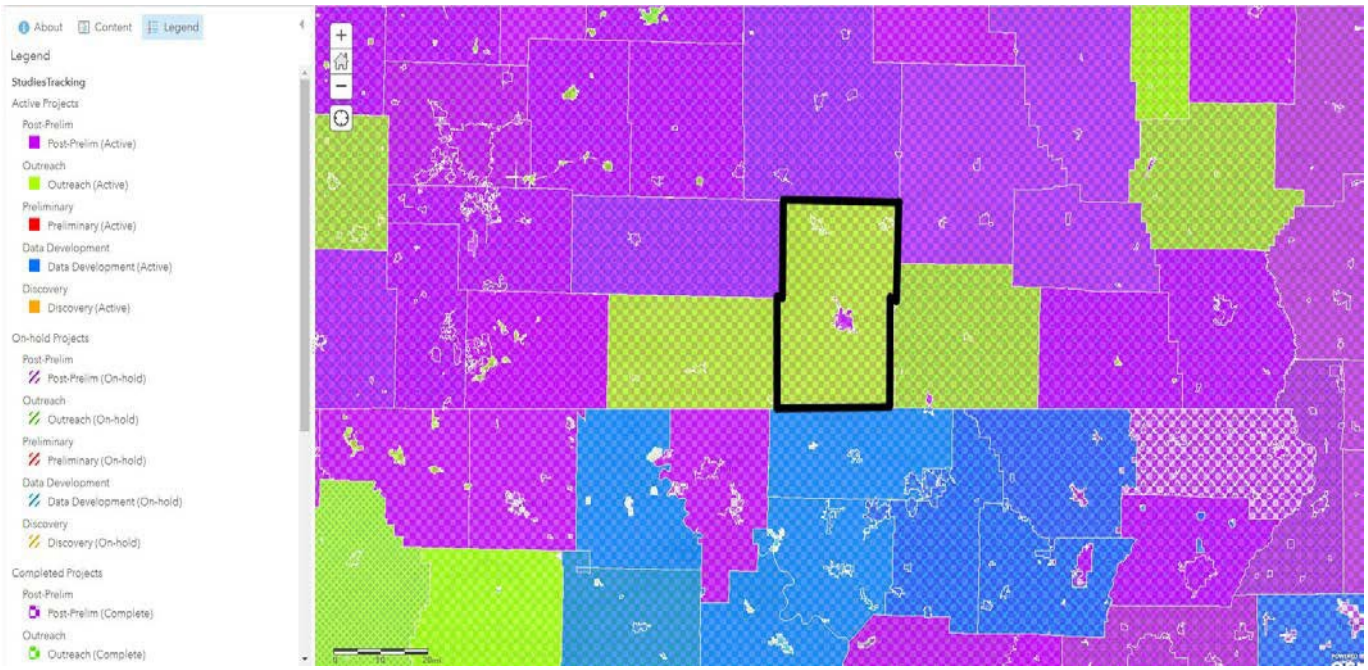
A review of the most current data, reports, studies and Plans relating to hazard mitigation planning in Howell County were reviewed in order to provide the latest "snapshot" of existing conditions to inform the development of the 2017 Plan. Local planning documents that were reviewed were the Region G Threat Hazard Risk Assessment (THIRA), the Comprehensive Economic Development Strategy, the South Central Regional Transportation Plan, The State Transportation Plan, and the Howell County Local Emergency Operations Plan. Where available, information from these Plans was integrated into the planning meeting discussions and into the Hazard Mitigation Plan narrative itself.

Coordination with FEMA Risk MAP Project

Risk Mapping, Assessment, and Planning (Risk MAP) is the Federal Emergency Management Agency (FEMA) Program that provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Through collaboration with State, Tribal, and local entities, Risk MAP delivers quality data that increases public awareness and leads to action that reduces risk to life and property. As depicted in the following Figure 1.1., Howell County is

currently within the active Outreach phase of Risk MAP activities:

Figure 1.1. Map of RiskMAP projects



Howell County Emergency Operations Plan (EOP)

Howell County emergency management is set up along the following functional segments: direction and control; communications and warning; emergency public information; damage assessment; law enforcement; fire and rescue; civil disorder; hazardous materials response; public works; evacuation; in-place sheltering; reception and care; health and medial terrorism response; and resources and supply. This plan also defines lines of succession for the continuity of government operations during a disaster as well as the preservation of records and the logistics of administrative functions such as procedures for obtaining temporary use of facilities. The Howell County Emergency Operations Plan was last updated in 2021.

South Central Ozark Regional Transportation Plan (RTP)

SCOCOG maintains and updates annually the Regional Transportation Plan (RTP) as part of a work agreement with the Missouri Department of Transportation. The RTP begins with the statewide Long Range Transportation Plan's goals then refines them to fit the unique nature of the South Central region. The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.

Comprehensive Economic Development Strategy (CEDS)

The regional Comprehensive Economic Development Strategy was updated in 2019 following an extensive regional planning process. A dozen planning meetings were held throughout the seven county region to identify economic development goals and strategies, gain input on the function and effectiveness of the regional planning commission's services, and identify vital economic development projects & programs for every jurisdiction in the region. The CEDS provides detailed information on social and economic data, and an overview of funding programs available to local governments and not-for-profit agencies.

Community, economic, and human resources development projects continue to be implemented across Howell County. All three incorporated communities, and the county itself are very active in these areas. Howell County acknowledged some of their emergency management and response needs in the Community Improvement Project List contained in the 2019 Comprehensive Economic Development Strategy. Projects listed by municipalities in Howell County in the CEDS relating to emergency management are listed on the next page:

- Community tornado safe room in Willow Springs
- Community tornado safe room in West Plains
- Backup generator at the Howell County Administration Office
- Water and Wastewater Improvement Projects in West Plains and Mountain View

A wide variety of technical data gathered from a number of state and federal agencies was integrated to the 2017 Plan to develop the Risk Assessment portion of the plan. Federal Emergency Management

Agency DFIRM maps were utilized to delineate flood hazard areas and at-risk structures in the county. NOAA data was used to compile event history for hazard profiles. Data from Missouri Department of Transportation, Missouri Department of Natural Resources, and Missouri Economic Resource Information Center (MERIC) were utilized to define the county's vulnerability to natural hazard events.

National datasets such as the National Agriculture Imagery Program, the National Inventory of Dams, the SILVIS Lab housed at the University of Wisconsin-Madison, and the 2020 U.S. Census were referenced in the updated Risk Assessment.

Step 4: Assess the Hazard: Identify and Profile Hazards
(Handbook Task 5)

The hazard profiles contained within the 2017 Howell County Hazard Mitigation Plan were reassessed during the kickoff planning meeting in October.

During the remainder of the planning meetings in the county, attendees were provided the latest hazard data via the research conducted by the South Central Ozark Council of Governments. The attendees provided to SCOCOG their input on hazard events from the DCQs completed by each participating jurisdiction. By consensus the participants identified the natural hazards that are not considered a threat to their own jurisdiction and eliminated those disasters from consideration in the Risk Assessment process. A Hazard Vulnerability Sheet was completed by each participating jurisdiction to help determine the perceived threat faced by their respective jurisdictions for inclusion in the Hazard Mitigation Plan.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Identified assets in the planning area include population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction were derived from GIS layers identified structures by use in the county and the local jurisdiction and school district data collection questionnaires, and FEMA DFIRM data. Potential losses to existing development were estimated on hazard event scenarios and annualized losses. In most cases the county assessor's valuations were used to estimate structure losses in impacted areas by structure occupancy type. The methodology for estimating losses varies by hazard. Loss estimates are included in each hazard profile contained in the Risk Assessment chapter.

Step 6: Set Goals
(Handbook Task 6)

The Mitigation Planning Committee reviewed the goals from the 2017 Howell County Plan during the kickoff planning meeting in October 2021. The MPC opted to carry over the Mitigation Goals from the previous iteration of the plan, as they were determined to still be applicable:

Goal 1: Protect the Lives and Property of all Citizens of Howell County

- Identify and provide sufficient emergency shelters.
- Review and maintain current warning systems for sufficient coverage.

Goal 2: Preserve the Functioning of Civil Government During Natural Disasters

- Implement proper maintenance and necessary upgrades of critical buildings and infrastructures in the county
- Improve the efficiency, timing, and effectiveness of response and recovery efforts for natural hazard disasters.

Goal 3: Maintain Economic Activities Essential to the Survival and Recovery from Natural Disasters

- Periodically review chain of command of government organizations for emergency situations and keep up-to-date.
- Continuously review communications systems and keep in good working order.

Step 7: Review Possible Mitigation Actions and Activities

The Mitigation Planning Committee and representatives from participating jurisdictions reviewed the mitigation actions from the 2017 Plan during the October kickoff meeting, as well as subsequent planning meetings with participating jurisdictions. It was decided that a couple of the actions from the previous plan were vague or unclear in their intent and the consensus of the group was that the mitigation actions needed to be more individualized in nature. New actions were identified, potential costs were discussed, lead agencies and staff were identified. Actions were prioritized using the STAPLEE methodology during the second planning meetings with participating jurisdictions. The FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* was used as a primary source to guide the action formulation process. Participants were encouraged to focus on mitigation efforts that could be reasonably be attained in the next five-to-ten years.

Step 8: Draft an Action Plan

Progress in implementing the mitigation actions will be reviewed annually by the regional planner housed at the South Central Ozark Council of Governments. Additionally, as potential grant funding becomes available, SCOCOG planners will work with the jurisdictions of Howell County to develop applications when a viable project arises.

Step 9: Adopt the Plan (Handbook Task 8)

The jurisdictions will be asked to adopt the plan after SEMA's initial plan review to ensure that no wholesale changes are being required within the planning document. Upon approval of the draft Plan by SEMA staff, the SCOCOG planners will work with participating jurisdictions to facilitate the Plan Adoption process.

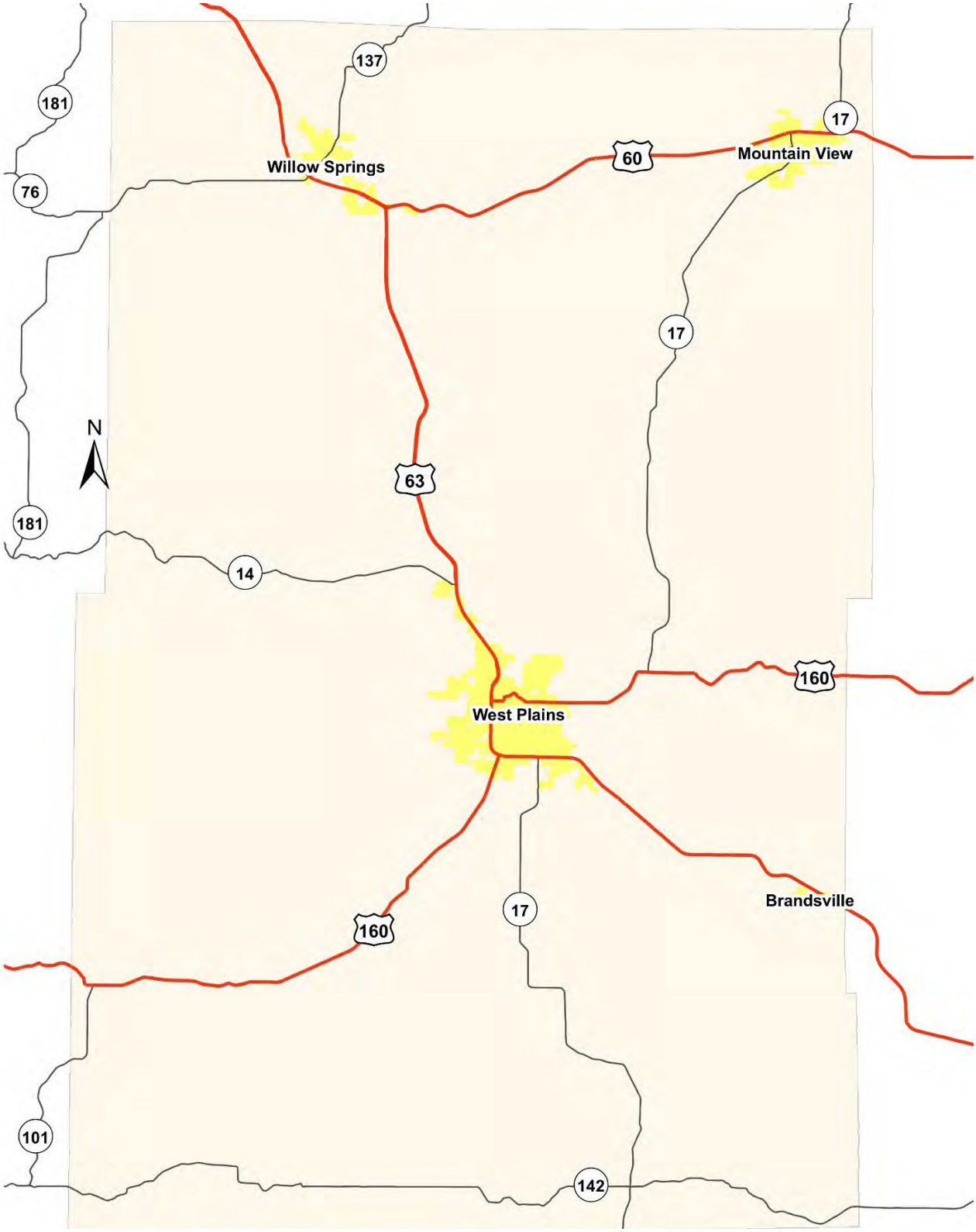
Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

During the planning kickoff meeting it was decided that the implementation the mitigation actions will be reviewed annually and revised (as needed) by the regional planner housed at the South Central Ozark Council of Governments. Additionally, as potential grant funding becomes available, SCOCOG planners will work with the jurisdictions of Howell County to develop applications when a viable project arises. The process for Plan Maintenance is detailed in Chapter 5 of this document.

2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 Howell County Planning Area Profile

Figure 2.1. Map of Howell County Map of Douglas County



According to the 2020 American Community Survey Census Estimates, the 2020 population of Howell County was 40,130, which represented a decrease from the County's 2010 census population of 40,400. This represents a decrease of 370 residents or 0.9% decline since the 2010 census. The State of Missouri's population increased 7.5% during the same time period.

The median household income for Howell County rose from $35,282 in 2010 to $39,482 in the 2020 ACS Estimates, yet family income still lags far behind the state and national figures of $49,600 and $53,292, respectively.

The median assessed home value in Howell County in 2020 was $114,600, an increase of nearly 18% since 2010.

2.1.1 Geography, Geology and Topography

Howell County is located in the south-central region of Missouri, in an area referred to as the Ozark Plateau. This part of Missouri is characterized by one of the most karstic regions in the continental United States. A region with outstanding water resources, numerous springs, sinkholes, losing streams, caves and hollows.

The underground and surface water resources found in Howell County are very much connected as a result of the karst topography of the county and region. There are seven unique watershed in the county, each having their own unique drainage feature—creek or river—that flows south-southwest toward larger rivers and final destinations in Arkansas to the south.

Watershed	General Location in Howell County	Tributary to:
Indian Creek	Extreme Northwest	North Fork River
Jacks Fork	Extreme Northern	Current River
Eleven Point	Northeast-Central	Eleven Point River
North Fork	Northwest	White River (AR)
Howell Creek	Central-East Central	Warm Fork River
Bennett's Bayou	Southwest	North Fork River
Myatt Creek	Southeast	Spring River

The vast majority of the county is rural. Farmland in Howell County totals 239,390 acres, or approximately 47%. Another 105,000 acres, or 21%, is held by state or federal agencies. The overall population density in the county is 13.2/sq. mi.

Elevations in Howell County range from approximately 1,560 feet located at King Mountain east of Willow Springs, to the lowest elevation about sea level of 619 feet located in the southeast corner of the county along Myatt Creek.

2.1.2 Climate

Howell County's average annual precipitation through the reporting years of 1971-2020 was 44.91 inches. The average annual temperature for the county is 56 degrees Fahrenheit. On average, the hottest month of the year in Howell County is July, with a mean temperature of 78.6 degrees. The coldest month is January, with a mean temperature of 32.2 degrees.

2.1.3 Demographics

Table 2.1. Howell County Population 2000-2020 by Community

Jurisdiction	Total Population 2010	Population Estimate 2020	2010-2020 # Change	2000-2020 % Change
Howell County	40,400	40,130	-270	-0.6%
City of Brandsville	161	191	+30	18.6%
City of Mountain View	2,719	2,663	-56	-2.0%
City of West Plains	11,986	12,290	+304	2.5%
City of Willow Springs	2,184	1,902	-282	-13.0%

Source: U.S. Bureau of the Census, 2020 ACS estimates

Table 2.2. Unemployment, Poverty, Education, and Language Percentage Demographics

Jurisdiction	Total in Labor Force	Percent of Population Unemployed	Percent of Families Below the Poverty Level	Percentage of Population (High School graduate)	Percentage of Population (Bachelor's degree or higher)	Percentage of population (spoken language other than English)
Howell County	16512	52.2	23.8	86.1	17.3	3.1
City of Brandsville	25	13.6	20.1	61.3	1.9	0.0
City of Mountain View	1088	48.5	23.6	70.9	12.1	0.8
City of West Plains	5296	55.8	32.4	87.7	22.4	3.6
City of Willow Springs	852	56.4	22.9	84.1	12.8	0.9
State	3,005,604	8.4	11.1	88.0	26.7	6.1

Source: U.S. Census, 2020 American Community Survey, 5-year Estimates.

2.1.4 History

Howell County is in the south central part of the State of Missouri. The county was formally organized on March 2, 1857, and was created from parts of Oregon and Ozark Counties. Howell County was settled by a fur trapper by the name of Adams, who later sold his land holdings to Josiah Howell. Howell had migrated to the area from Tennessee and is credited with being the first permanent settler in the county, which now bears his name. The City of West Plains in the county seat.

The area was inhabited by the Osage Native American Tribe as late as 1808. Many Native Americans visited the county frequently for hunting purposes. Today, running north and south is an ancient Native American Trail where more than 1,000 prehistoric mounds have been identified. Arrow quarries and campsites are found along valley

streambeds. Utilized extensively by the civilization knows as the 'Ozark Bluff Dwellers', the area was well known to Arkansas, Delaware, Shawnee, Osage and other tribes. The first white settlers arrived in the 1830s, attracted by freedom, plentiful game and fine streams. Most settlers to the area relocated from southern Appalachia.

During the Civil War, troops moving through the county lived on the land; roving guerrilla bands burned some homes and mills and killed some heads of households. There were no pitched battles or skirmishes of note. After the war settlers from the same areas came back, many to homestead government land. Many were Union veterans. The county grew as an area of small cotton, grain and livestock farms and West Plains as a trading, banking and judicial center.

The County has experienced many changes in its economy and population since the early 20th century. The 1950s and 1960s saw people moving to large metropolitan areas for employment and opportunity, however, as the 1970s became the 1980s the trend began to reverse itself. The population shift came back to rural areas. A recent survey conducted by the Office of Social and Economic Data Analysis, University of Missouri shows that significant portion of this growth is the result of households moving into the county from other counties in Missouri and several other states to retire in the Ozarks.

Howell County, centrally located in the Ozark region, offers abundant water, a clean environment, increased economic activity and inexpensive land. Due to the increases in population leading to steady growth in economic activity, new investment and employment in retail trade, manufacturing and other sectors has provided increased household income and wealth for many county residents.

2.1.5 Occupations

Table 2.3. Occupation Statistics, Howell County, Missouri

Place	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Construction, extraction, installation, maintenance, and repair occupations	Production, Transportation, and Material Moving Occupations
Howell County	34.1	16.03	22.3	9.1	17.6
Brandsville	21.7	13.1	0	0	65.2
Mountain View	19.1	18.1	19.3	10.7	32.3
West Plains	39.4	15.3	25.9	9.4	10.1
Willow Springs	21.9	21.4	20.1	4.8	30.3

Source: U.S. Census, 2020 American Community Survey, 5-year Estimates.

2.1.6 Agriculture

According to the 2016 Census of Agriculture, Howell County is home to 1,535 farms, consisting of 353,742 acres. The average market value of products sold per farm is $35,139, a 3% decrease in value from 2007. The top crop in the county is Forage-land, the top livestock item is cattle and calves. The farming sector is a significant part of the county's economy with an estimated 17.4% of workers employed as a farm owner or farm worker. This figure is lower than the overall 19.8% for the seven county South Central Missouri region.

2.1.7 FEMA Hazard Mitigation Assistance Grants in Planning Area

Table 2.4. FEMA HMA Grants in County from 1993-2020

Project Type	Sub applicant	Award Date	Project Total
Tornado Safe Room	West Plains R-VII	2005	$2,779,449
Tornado Safe Room	Howell Valley R-I	2006	$1,981,144
Tornado Safe Room	Fairview R-III	2006	$1,059,576
Tornado Safe Room	Richards R-V	2008	$1,088,000
Tornado Safe Room	Missouri St. Univ. – WP	2008	$1,600,000
Tornado Safe Room	Glenwood R-VIII	2011	$459,957
Total	-	-	**$8,968,126**

Source: SCOCOG

2.1.8 FEMA Public Assistance (PA) Grants in Planning Area

Since 2002, jurisdictions in Howell County have received over twenty million dollars in public assistance due to natural hazard damages. **Table 2.5** shows all the public assistance payouts received by jurisdictions, as well as the project type and disaster declaration.

Table 2.5. PA Grants in Howell County, Missouri 2002 - 2020

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
1412	Severe Storm(s)	Debris Removal	Small	28715.01	21536.26
1412	Severe Storm(s)	Debris Removal	Small	8237.2	6177.9
1412	Severe Storm(s)	Public Utilities	Small	4686.63	3514.97
1412	Severe Storm(s)	Protective Measures	Small	1303.65	1021.94
1412	Severe Storm(s)	Roads and Bridges	Small	1723.8	1292.85
1412	Severe Storm(s)	Public Utilities	Small	2000	1500
1412	Severe Storm(s)	Roads and Bridges	Small	12406.5	9304.88
1412	Severe Storm(s)	Roads and Bridges	Small	6571.36	4928.52
1412	Severe Storm(s)	Roads and Bridges	Small	1032	774
1412	Severe Storm(s)	Roads and Bridges	Small	7250.04	5437.53
1412	Severe Storm(s)	Roads and Bridges	Small	38441.16	28830.87
1412	Severe Storm(s)	Recreational or Other	Small	3710.15	2782.61
1412	Severe Storm(s)	Water Control Facilities	Small	14970.9	11228.18
1412	Severe Storm(s)	Roads and Bridges	Small	5318.25	3988.69
1412	Severe Storm(s)	Roads and Bridges	Small	8031.69	6023.77
1412	Severe Storm(s)	Roads and Bridges	Small	8023.22	6017.42
1412	Severe Storm(s)	Roads and Bridges	Small	50283.66	37712.75
1412	Severe Storm(s)	Recreational or Other	Small	9146.95	6860.21

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
1412	Severe Storm(s)	Roads and Bridges	Small	41029.5	30772.13
1412	Severe Storm(s)	Roads and Bridges	Small	45391.33	34043.5
1412	Severe Storm(s)	Roads and Bridges	Small	46592.8	34944.6
1412	Severe Storm(s)	Roads and Bridges	Small	45044.68	33783.51
1412	Severe Storm(s)	Roads and Bridges	Small	31942.4	23956.8
1412	Severe Storm(s)	Roads and Bridges	Small	0	0
1412	Severe Storm(s)	Roads and Bridges	Small	0	0
1412	Severe Storm(s)	Roads and Bridges	Small	20016	15012
1412	Severe Storm(s)	Roads and Bridges	Small	21064.2	15798.15
1412	Severe Storm(s)	Roads and Bridges	Small	37889.67	28417.25
1412	Severe Storm(s)	Roads and Bridges	Small	42715.97	32036.98
1412	Severe Storm(s)	Roads and Bridges	Small	0	0
1412	Severe Storm(s)	Roads and Bridges	Small	19179.98	14384.99
1412	Severe Storm(s)	Roads and Bridges	Small	48639.16	36479.37
1412	Severe Storm(s)	Roads and Bridges	Small	34311.49	25733.62
1749	Severe Storm(s)	Roads and Bridges	Large	313314.84	234986.13
1749	Severe Storm(s)	Roads and Bridges	Large	450295.04	337721.29
1749	Severe Storm(s)	Roads and Bridges	Small	23433.9	17575.43
1749	Severe Storm(s)	Roads and Bridges	Small	5537.97	4153.48
1749	Severe Storm(s)	Public Utilities	Small	2678.09	2008.57
1749	Severe Storm(s)	Debris Removal	Small	34131.35	25598.51
1749	Severe Storm(s)	Public Utilities	Small	34588.36	25941.27
1749	Severe Storm(s)	Roads and Bridges	Small	7792.64	5844.48
1749	Severe Storm(s)	Roads and Bridges	Small	51115.73	38336.8
1749	Severe Storm(s)	Roads and Bridges	Small	58348.38	43761.29
1749	Severe Storm(s)	Roads and Bridges	Small	54222.68	40667.01
1749	Severe Storm(s)	Roads and Bridges	Small	2381.85	1786.39
1749	Severe Storm(s)	Roads and Bridges	Small	55021.52	41266.14
1749	Severe Storm(s)	Debris Removal	Small	10963.61	8222.71
1749	Severe Storm(s)	Roads and Bridges	Small	46432.48	34824.36
1749	Severe Storm(s)	Roads and Bridges	Small	44798.69	33599.02
1749	Severe Storm(s)	Public Buildings	Small	4697.63	3523.22
1749	Severe Storm(s)	Roads and Bridges	Small	45047.8	33785.85
1749	Severe Storm(s)	Roads and Bridges	Small	48724.18	36543.14
1749	Severe Storm(s)	Roads and Bridges	Small	30893.7	23170.28
1749	Severe Storm(s)	Roads and Bridges	Small	10943.78	8207.84
1749	Severe Storm(s)	Roads and Bridges	Small	45616.49	34212.37
1749	Severe Storm(s)	Roads and Bridges	Small	57607.81	43205.86
1749	Severe Storm(s)	Roads and Bridges	Small	1464.15	1098.11
1749	Severe Storm(s)	Roads and Bridges	Small	49153.99	36865.49
1749	Severe Storm(s)	Roads and Bridges	Small	37708.9	28281.68
1749	Severe Storm(s)	Roads and Bridges	Small	11971.89	8978.92

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
1749	Severe Storm(s)	Roads and Bridges	Small	53293.56	39970.17
1749	Severe Storm(s)	Roads and Bridges	Small	36126.74	27095.06
1809	Severe Storm(s)	Debris Removal	Small	36672.95	27504.71
1809	Severe Storm(s)	Public Utilities	Small	15440.11	11580.08
1809	Severe Storm(s)	Public Utilities	Small	1116.48	837.36
1809	Severe Storm(s)	Protective Measures	Small	1493.54	1120.16
1822	Severe Storm(s)	Protective Measures	Large	96992.49	72744.36
1822	Severe Storm(s)	Debris Removal	Large	985839.96	739379.97
1822	Severe Storm(s)	Public Utilities	Large	120403.2	90302.4
1822	Severe Storm(s)	Debris Removal	Large	231944.94	173958.71
1822	Severe Storm(s)	Protective Measures	Large	98100.45	73575.34
1822	Severe Storm(s)	Public Buildings	Large	243861	182895.75
1822	Severe Storm(s)	Public Buildings	Large	286122.59	214591.94
1822	Severe Storm(s)	Public Buildings	Small	1000	750
1822	Severe Storm(s)	Recreational or Other	Small	1000	750
1822	Severe Storm(s)	Debris Removal	Small	8045.59	6034.19
1822	Severe Storm(s)	Protective Measures	Small	18889.19	14166.89
1822	Severe Storm(s)	Protective Measures	Small	141.5	106.13
1822	Severe Storm(s)	Protective Measures	Small	2007.03	1505.27
1822	Severe Storm(s)	Debris Removal	Small	5523.15	4142.36
1822	Severe Storm(s)	Public Buildings	Small	1758.79	1319.09
1822	Severe Storm(s)	Debris Removal	Small	3900	2925
1822	Severe Storm(s)	Public Buildings	Small	17927.15	13445.36
1822	Severe Storm(s)	Protective Measures	Small	1000	750
1822	Severe Storm(s)	Protective Measures	Small	47637.4	35728.05
1822	Severe Storm(s)	Public Buildings	Small	500	375
1822	Severe Storm(s)	Public Buildings	Small	250	187.5
1822	Severe Storm(s)	Protective Measures	Small	14067.98	10550.99
1980	Severe Storm(s)	Public Buildings	Small	1000	750
1980	Severe Storm(s)	Public Buildings	Small	1000	750
1980	Severe Storm(s)	Protective Measures	Small	3185.97	2389.48
1980	Severe Storm(s)	Public Utilities	Small	4525.22	3393.92
1980	Severe Storm(s)	Recreational or Other	Small	5360	4020
1980	Severe Storm(s)	Roads and Bridges	Small	3407.06	2555.3
1980	Severe Storm(s)	Protective Measures	Small	7639.88	5729.91
1980	Severe Storm(s)	Protective Measures	Small	1781.79	1336.34
1980	Severe Storm(s)	Protective Measures	Small	4844.63	3633.47
1980	Severe Storm(s)	Protective Measures	Small	6944.59	5208.44
1980	Severe Storm(s)	Debris Removal	Small	15787.5	11840.63
1980	Severe Storm(s)	Roads and Bridges	Small	4831.78	3623.84
1980	Severe Storm(s)	Roads and Bridges	Small	3820.28	2865.21
1980	Severe Storm(s)	Roads and Bridges	Small	1802.09	1351.57

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
1980	Severe Storm(s)	Roads and Bridges	Small	3143.31	2357.48
1980	Severe Storm(s)	Protective Measures	Small	2113.49	1585.12
1980	Severe Storm(s)	Roads and Bridges	Small	8065.85	6049.39
1980	Severe Storm(s)	Roads and Bridges	Small	37084.97	27813.73
1980	Severe Storm(s)	Roads and Bridges	Small	34319.81	25739.86
1980	Severe Storm(s)	Roads and Bridges	Small	14375.21	10781.41
1980	Severe Storm(s)	Roads and Bridges	Small	1552.38	1164.29
1980	Severe Storm(s)	Debris Removal	Small	9126.3	6844.73
1980	Severe Storm(s)	Protective Measures	Small	5200.18	3900.14
1980	Severe Storm(s)	Roads and Bridges	Small	21620.93	16215.7
1980	Severe Storm(s)	Roads and Bridges	Small	20455.36	15341.52
1980	Severe Storm(s)	Water Control Facilities	Small	8936.62	6702.47
1980	Severe Storm(s)	Roads and Bridges	Small	8432.87	6324.65
1980	Severe Storm(s)	Roads and Bridges	Small	15963.8	11972.85
1980	Severe Storm(s)	Roads and Bridges	Small	5005.01	3753.76
1980	Severe Storm(s)	Roads and Bridges	Small	4445.68	3334.26
1980	Severe Storm(s)	Roads and Bridges	Small	13346.63	10009.97
1980	Severe Storm(s)	Roads and Bridges	Small	13821.71	10366.28
1980	Severe Storm(s)	Roads and Bridges	Small	7936.68	5952.51
1980	Severe Storm(s)	Roads and Bridges	Small	8475.98	6356.99
1980	Severe Storm(s)	Roads and Bridges	Small	5392.6	4044.45
1980	Severe Storm(s)	Roads and Bridges	Small	15022.1	11266.58
1980	Severe Storm(s)	Roads and Bridges	Small	30410.99	22808.24
1980	Severe Storm(s)	Roads and Bridges	Small	19423.79	14567.84
1980	Severe Storm(s)	Roads and Bridges	Small	6656.7	4992.53
1980	Severe Storm(s)	Roads and Bridges	Small	8955.91	6716.93
1980	Severe Storm(s)	Public Utilities	Small	35847.27	26885.45
1980	Severe Storm(s)	Roads and Bridges	Small	5918.34	4438.76
1980	Severe Storm(s)	Roads and Bridges	Small	13424.14	10068.11
1980	Severe Storm(s)	Roads and Bridges	Small	23433.4	17575.05
1980	Severe Storm(s)	Roads and Bridges	Small	36900.38	27675.29
1980	Severe Storm(s)	Roads and Bridges	Small	13656.04	10242.03
1980	Severe Storm(s)	Roads and Bridges	Small	6336.2	4752.15
1980	Severe Storm(s)	Roads and Bridges	Small	15753.76	11815.32
4250	Flood	Roads and Bridges	Large	0	0
4250	Flood	Roads and Bridges	Small	15431.47	11573.6
4250	Flood	Roads and Bridges	Small	18936.03	14202.02
4250	Flood	Roads and Bridges	Small	5378.83	4034.12
4250	Flood	Roads and Bridges	Small	10147.41	7610.56
4250	Flood	Roads and Bridges	Small	12459.89	9344.92
4250	Flood	Roads and Bridges	Small	22895.41	17171.56
4317	Flood	Roads and Bridges	Large	161797.96	121348.47

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
4317	Flood	Roads and Bridges	Large	76290.45	57217.83
4317	Flood	Recreational or Other	Large	558055.71	418541.79
4317	Flood	Debris Removal	Large	263181.85	210545.48
4317	Flood	Debris Removal	Large	283480.79	240958.67
4317	Flood	Roads and Bridges	Large	178041.86	133531.4
4317	Flood	Roads and Bridges	Large	383933.92	287950.44
4317	Flood	Protective Measures	Small	6944.19	5208.14
4317	Flood	Public Buildings	Small	89366.9	67025.18
4317	Flood	Protective Measures	Small	4055	3041.25
4317	Flood	Roads and Bridges	Small	29617.75	22213.31
4317	Flood	Public Buildings	Small	76805.94	57604.46
4317	Flood	Public Buildings	Small	26349.29	19761.97
4317	Flood	Roads and Bridges	Small	8568.92	6426.69
4317	Flood	Roads and Bridges	Small	120385.39	90289.04
4317	Flood	Public Buildings	Small	95487	71615.25
4317	Flood	Public Utilities	Small	10323.78	7742.83
4317	Flood	Roads and Bridges	Small	3885.79	2914.34
4317	Flood	Roads and Bridges	Small	10314.41	7735.81
4317	Flood	Water Control Facilities	Small	3647.03	2735.27
4317	Flood	Protective Measures	Small	5898.64	4423.98
4317	Flood	Debris Removal	Small	10532.57	8952.68
4317	Flood	Debris Removal	Small	74220.28	59376.22
4317	Flood	Protective Measures	Small	39256.98	29442.74
4317	Flood	Roads and Bridges	Small	17499.53	13124.65
4317	Flood	Roads and Bridges	Small	65975.56	49481.67
4317	Flood	Public Utilities	Small	37201.58	27901.19
4317	Flood	Roads and Bridges	Small	105491.3	79118.48
4317	Flood	Recreational or Other	Small	41434.86	31076.15
4317	Flood	Public Utilities	Small	80313.92	60235.44
4317	Flood	Roads and Bridges	Small	51143	38357.25
4317	Flood	Roads and Bridges	Small	58368.91	43776.68
4317	Flood	Roads and Bridges	Small	15277.55	11458.16
4317	Flood	Debris Removal	Small	22556.5	16917.38
4317	Flood	Recreational or Other	Small	35324.94	26493.71
4317	Flood	Debris Removal	Small	45752.1	34314.08
4317	Flood	Protective Measures	Small	5399.61	4049.71
4317	Flood	Recreational or Other	Small	60805.91	45604.43
4317	Flood	Roads and Bridges	Small	4538.29	3403.72
4317	Flood	Recreational or Other	Small	19851.9	14888.93
4317	Flood	Roads and Bridges	Small	14582.49	10936.87
4317	Flood	Roads and Bridges	Small	15546.37	11659.78
4317	Flood	Public Utilities	Small	8012.05	6009.04

Disaster Number	Incident Type	Damage Category	Project Size	Project Amount ($)	Federal Share ($)
4317	Flood	Roads and Bridges	Small	67329.49	50497.12
4317	Flood	Roads and Bridges	Small	66150	49612.5
4317	Flood	Debris Removal	Small	10751.82	8063.87
4317	Flood	Public Utilities	Small	20162.85	15122.14
4317	Flood	Public Utilities	Small	111883.4	83912.56
4317	Flood	Public Utilities	Small	50642.69	37982.02
4317	Flood	Public Utilities	Small	5460.78	4095.59
4317	Flood	Roads and Bridges	Small	0	0
4317	Flood	Public Utilities	Small	40442.71	30332.03
4317	Flood	Roads and Bridges	Small	28767.81	21575.86
4451	Severe Storm(s)	Protective Measures	Small	7074.56	5305.92
4451	Severe Storm(s)	Debris Removal	Small	72436.63	54327.47
4451	Severe Storm(s)	Protective Measures	Small	12143.78	9107.84
4451	Severe Storm(s)	Protective Measures	Small	3843.56	2882.67
4451	Severe Storm(s)	Public Utilities	Small	57698.83	43274.12
4451	Severe Storm(s)	State Management	Small	3548.74	3548.74
4552	Severe Storm(s)	Debris Removal	Small	121381.44	91036.08
4552	Severe Storm(s)	Public Buildings	Small	9772.89	7329.67
4552	Severe Storm(s)	Protective Measures	Small	7981.69	5986.27
4552	Severe Storm(s)	Public Utilities	Small	49439.17	37079.38
4552	Severe Storm(s)	State Management	Small	2961.75	2961.75

2.2 Jurisdictional Profiles and Mitigation Capabilities

The following section will include individual profiles for each participating jurisdiction. It will also include a discussion of previous mitigation initiatives in the planning area. There will be a summary table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities. The unincorporated county is profiled first, followed by the incorporated communities, and the public-school districts.

2.2.1 Unincorporated Howell County, Missouri

Howell County's jurisdiction includes all unincorporated areas within the county boundaries. Howell is identified as a third-class county in the State of Missouri. The governing body of the County is the County Commission. The Commission consists of a Presiding Commissioner, a northern Commissioner and a southern Commissioner.

The County's elected governing body; the Board of County Commissioners directs the general administration of County Government. The Commission sets broad operating policies, enacts ordinances and establishes budgets as

mandated by State law. The County enters into contracts with other public and private agencies to ensure the smooth flow of services including law enforcement, construction and maintenance of public roads, bridges and the operations of county offices, equipment and services. The departments of the County government include:

- Board of Commissioners
- County Assessor
- County Attorney
- County Auditor
- County Recorder
- County Sheriff
- County Treasurer
- County Coroner
- County Clerk
- Emergency Management

Mitigation Initiatives and Capabilities

Staff capabilities to mitigate the impact of natural hazards include the local emergency management officials and local law enforcement members who are involved in mitigation planning, response and recovery processes. Efforts in coordinating with local government officials and cooperating with private organizations to: 1) prevent avoidable disasters and reduce the vulnerability of the residents to any disaster that may strike; 2) establish capabilities for protecting citizens from the effects of disasters; 3) respond effectively to the actual occurrences of disasters; and 4) provide for recovery in the aftermath of any emergency involving extensive damage within the county. The Emergency Management Director (EMD) is responsible for the development and maintenance of the Local Emergency Operations Plan.

Table 2.6 provides information about the mitigation capabilities and policies for the unincorporated county based on responses from the Mitigation Planning Data Collection Questionnaire.

Table 2.6. Unincorporated Howell County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Capital Improvement Plan	None
Local Emergency Operations Plan	Yes 12/2015
Local Recovery Plan	None
Local Mitigation Plan	Yes, 2016
Economic Development Plan	Yes, 2019
Transportation Plan	Yes, 2019
Land-use Plan	None
Watershed Plan	None

Firewise or other fire mitigation plan	No
Open Space/Recreation Plan	Yes, 12/2015
Policies/Ordinance	
Zoning Ordinance	None
Building Code	None
Floodplain Ordinance	None
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
NFIP Participant	No
CRS Participating Community	No
Hazard Awareness Program	Yes, 12/2015
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	No

Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Mutual Aid Agreements	No
Studies/Reports/Maps	
Flood Insurance Maps	Yes, 2008
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	Yes, 2011
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	No
Emergency Response Team	Yes – HSRT
Hazardous Materials Expert	Yes – HSRT
Local Emergency Planning Committee	No
Transportation Department	No
Housing Authority	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur debt through GO bonds	Yes
Ability to incur debt through special tax bonds	Yes

Source: Data Collection Questionnaire, 2021

2.2.2 City of Brandsville

- Mayor/Board of Aldermen
- City Clerk
- Water

According to 2020 ACS Estimates, the median year built for structures in Brandsville is 1983. Additionally, 17.1% of the population were over the age of 65, median household income was $24,500, and 26.5% of the families in Brandsville were living below the poverty level. Mitigation capabilities in Brandsville include:

- Mutual aid agreements with local governments/law enforcement

Table 2.7. City of Brandsville Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Capital Improvement Plan	None
Local Emergency Operations Plan	Yes 12/2015
Local Recovery Plan	None
Local Mitigation Plan	Yes, 2017
Economic Development Plan	Yes, 2014
Transportation Plan	Yes, 2015
Land-use Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
Open Space/Recreation Plan	None
Policies/Ordinance	
Zoning Ordinance	None
Building Code	None
Floodplain Ordinance	None
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
NFIP Participant	No
CRS Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Yes - 8
Economic Development Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Mutual Aid Agreements	No

Studies/Reports/Maps	
Flood Insurance Maps	Yes, 2011
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	Yes, 2011
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes – Part Time
Emergency Management Director	No
NFIP Floodplain Administrator	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
Transportation Department	No
Housing Authority	No
Local Funding Availability	
Ability to apply for CDBG Grants	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes - Water
Impact fees for new development	No
Ability to incur debt through GO bonds	Yes
Ability to incur debt through special tax bonds	Yes

Source: Data Collection Questionnaire 2021

2.2.3 City of West Plains

The City of West Plains is centrally located in Howell County along US Highway 63. The governing body of West Plains includes the Mayor and Four Aldermen. West Plains' population growth was strong between the years 2000 and 2020. City departments include:

- Mayor/Board of Aldermen
- City Administrator
- City Clerk
- Municipal Courts
- Water, Sewer, Streets and Power
- Financial/Accounting
- Economic Development
- Emergency Management
- Airport
- Parks and Recreation
- Refuse/Recycling
- Tourism
- Police Department

According to 2020 Estimates, the median year built for structures in in West Plains is 1975. Additionally, 18% of the population were over the age of 65, median household income was $30,001, and 23.6% of the families in West Plains were living below the poverty level. Mitigation capabilities in West Plains include:

- Seventeen (17) outdoor warning siren
- Mutual aid agreements with local governments/law enforcement
- Several tornado saferooms

Table 2.8. City of West Plains Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 2016
Capital Improvement Plan	Yes, 2022
Local Emergency Operations Plan	Yes, 2013
Local Recovery Plan	Yes, 2015
Local Mitigation Plan	Yes, 2017
Economic Development Plan	Yes, 2014
Transportation Plan	Yes, 2015
Land-use Plan	Yes, 2016
Watershed Plan	None
Firewise or other fire mitigation plan	Yes, 2012
Open Space/Recreation Plan	Yes, 2016
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes, 2018
Floodplain Ordinance	Yes, 2016
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	None
Landscape Ordinance	None
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
NFIP Participant	Yes
CRS Participating Community	Yes

Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	Yes
ISO Fire Rating	Yes, 4
Economic Development Program	Yes
Public Education/Awareness	Yes
Property Acquisition	Yes
Planning/Zoning Boards	Yes
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Flood Insurance Maps	Yes, 2021
FEMA Flood Insurance Study (Detailed)	Yes, 2011
Evacuation Route Map	Yes
Critical Facilities Inventory	Yes, 2011
Vulnerable Population Inventory	No
Land Use Map	Yes, 2016
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Yes
Engineer	Yes
Development Planner	Yes
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Emergency Response Team	Yes
Hazardous Materials Expert	Yes
Local Emergency Planning Committee	No
Transportation Department	Yes
Housing Authority	No
Local Funding Availability	
Ability to apply for CDBG Grants	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur debt through GO bonds	Yes
Ability to incur debt through special tax bonds	Yes

2.2.4 City of Willow Springs

The City of Willow Springs is located in the northwest portion of Howell County along US Highway 63. The governing body of Willow Springs includes the Mayor and four (4) Aldermen. Willow Springs' population growth is nearly stagnant according to figures between the years 2000 and 2020. City departments include:

- Mayor/Board of Aldermen
- City Clerk
- Water and Sewer
- City Maintenance
- Emergency Management
- Fire Department
- Police Department

According to 2020 Estimates, the median year built for structures in Willow Springs is 1966. Additionally, 21% of the population were over the age of 65, median household income was $27,717, and 24.8% of the families in Willow Springs were living below the poverty level. Mitigation capabilities in Willow Springs include:

- Five (5) outdoor warning siren
- Mutual aid agreements with local governments/law enforcement
- One (1) part-time inspection & building code official

Table 2.9. City of Willow Springs Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	2004
Capital Improvement Plan	2015
Local Emergency Operations Plan	2013
Local Recovery Plan	2015
Local Mitigation Plan	2017
Economic Development Plan	2014
Transportation Plan	2015
Land-use Plan	2005
Watershed Plan	None
Firewise or other fire mitigation plan	2012
Open Space/Recreation Plan	2005
Policies/Ordinance	
Zoning Ordinance	YES
Building Code	2006 INTERNATIONAL
Floodplain Ordinance	2011
Subdivision Ordinance	2005
Tree Trimming Ordinance	N
Nuisance Ordinance	Y
Storm Water Ordinance	Y
Drainage Ordinance	N
Site Plan Review Requirements	N
Historic Preservation Ordinance	N
Landscape Ordinance	N
Program	
Zoning/Land Use Restrictions	Y
Codes Building Site/Design	Y
NFIP Participant	Y
CRS Participating Community	N

Hazard Awareness Program	Y
National Weather Service (NWS) Storm Ready	N
Building Code Effectiveness Grading (BCEGs)	N
ISO Fire Rating	4 -2015
Economic Development Program	N
Public Education/Awareness	Y
Property Acquisition	N
Planning/Zoning Boards	Y
Mutual Aid Agreements	Y
Studies/Reports/Maps	
Flood Insurance Maps	Y
FEMA Flood Insurance Study (Detailed)	Y
Evacuation Route Map	N
Critical Facilities Inventory	Y
Vulnerable Population Inventory	N
Land Use Map	Y
Staff/Department	
Building Code Official	Y
Building Inspector	Y
Mapping Specialist (GIS)	Y
Engineer	N
Development Planner	Y
Public Works Official	Y
Emergency Management Director	Y
NFIP Floodplain Administrator	Y
Emergency Response Team	Y
Hazardous Materials Expert	N
Local Emergency Planning Committee	Y
Transportation Department	Y
Housing Authority	N
Local Funding Availability	
Ability to apply for CDBG Grants	Y
Authority to levy taxes for a specific purpose	Y
Fees for water, sewer, gas, or electric services	Y
Impact fees for new development	Y
Ability to incur debt through GO bonds	Y
Ability to incur debt through special tax bonds	Y

2.2.5 City of Mountain View

The City of Mountain View is located in the extreme northeast portion of Howell County along US Highway 60. The governing body of Mtn. View includes the Mayor and four (4) Aldermen. The community's population growth is nearly stagnant according to figures between the years 2000 and 2020. City departments include:

- Mayor/Board of Aldermen
- City Clerk
- Water and Sewer
- City Maintenance
- Emergency Management
- Fire Department
- Police Department

According to 2015 Estimates, the median year built for structures in Mountain View is 1972. Additionally, 19.9% of the population were over the age of 65, median household income was $32,321, and 23.6% of the families in Mountain View were living below the poverty level. Mitigation capabilities in Mountain View include:

- Three (3) outdoor warning siren
- Mutual aid agreements with local governments/law enforcement
- One (1) part-time inspection & building code official

Table 2.10. City of Mountain View Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	2004
Capital Improvement Plan	2015
Local Emergency Operations Plan	2013
Local Recovery Plan	2015
Local Mitigation Plan	2017
Economic Development Plan	2014
Transportation Plan	2015
Land-use Plan	2005
Watershed Plan	None
Firewise or other fire mitigation plan	2012
Open Space/Recreation Plan	2005
Policies/Ordinance	
Zoning Ordinance	YES
Building Code	2009 INTERNATIONAL
Floodplain Ordinance	2011
Subdivision Ordinance	2005
Tree Trimming Ordinance	N
Nuisance Ordinance	Y
Storm Water Ordinance	Y
Drainage Ordinance	N
Site Plan Review Requirements	N
Historic Preservation Ordinance	N
Landscape Ordinance	N
Program	
Zoning/Land Use Restrictions	Y
Codes Building Site/Design	Y

NFIP Participant	Y
CRS Participating Community	N
Hazard Awareness Program	Y
National Weather Service (NWS) Storm Ready	N
Building Code Effectiveness Grading (BCEGs)	N
ISO Fire Rating	4 -2015
Economic Development Program	N
Public Education/Awareness	Y
Property Acquisition	N
Planning/Zoning Boards	Y
Mutual Aid Agreements	Y
Studies/Reports/Maps	
Flood Insurance Maps	Y
FEMA Flood Insurance Study (Detailed)	Y
Evacuation Route Map	N
Critical Facilities Inventory	Y
Vulnerable Population Inventory	N
Land Use Map	Y
Staff/Department	
Building Code Official	Y
Building Inspector	Y
Mapping Specialist (GIS)	Y
Engineer	N
Development Planner	Y
Public Works Official	Y
Emergency Management Director	Y
NFIP Floodplain Administrator	Y
Emergency Response Team	Y
Hazardous Materials Expert	N
Local Emergency Planning Committee	Y
Transportation Department	Y
Housing Authority	N
Local Funding Availability	
Ability to apply for CDBG Grants	Y
Authority to levy taxes for a specific purpose	Y
Fees for water, sewer, gas, or electric services	Y
Impact fees for new development	Y
Ability to incur debt through GO bonds	Y
Ability to incur debt through special tax bonds	Y

Table 2.11. Municipal Mitigation Capabilities Summary Table

CAPABILITIES	Howell County	Brandsville	Mountain View	West Plains	Willow Springs
Planning Capabilities					
Comprehensive Plan	N	None	2004	Yes, 2016	2004
Capital Improvement Plan	N	None	2015	Yes, 2016	2015
Local Emergency Operations Plan	Y, 2015	Yes 12/2015	2013	Yes, 2013	2013
Local Recovery Plan	N	None	2015	Yes, 2015	2015
Local Mitigation Plan	Y, 2017	Yes, 2017	2017	Yes, 2017	2017
Economic Development Plan	Y, 2014	Yes, 2014	2014	Yes, 2014	2014
Transportation Plan	Y, 2015	Yes, 2015	2015	Yes, 2015	2015
Land-use Plan	N	None	2005	Yes, 2016	2005
Watershed Plan	N	None	None	None	None
Firewise or other fire mitigation plan	Y, 2013	None	2012	Yes, 2012	2012
Open Space/Recreation Plan	N	None	2005	Yes, 2016	2005
Policies/Ordinance					
Zoning Ordinance	N	None	YES	Yes	YES
Building Code	N	None	2009 INTERNATIONAL	Yes, 2012	2006 INTERNATIONAL
Floodplain Ordinance	N	None	2011	Yes, 1979	2011
Subdivision Ordinance	N	None	2005	Yes	2005
Tree Trimming Ordinance	N	None	N	Yes	N
Nuisance Ordinance	N	None	Y	Yes	Y
Storm Water Ordinance	N	None	Y	Yes	Y
Drainage Ordinance	N	None	N	Yes	N
Site Plan Review Requirements	N	None	N	Yes	N
Historic Preservation Ordinance	N	None	N	None	N

APABILITIES	Howell County	Brandsville	Mountain View	West Plains	Willow Springs
Landscape Ordinance	N	None	N	None	N
Program					
Zoning/Land Use Restrictions	N	No	Y	Yes	Y
Codes Building Site/Design	N	No	Y	Yes	Y
NFIP Participant	N	No	Y	Yes	Y
CRS Participating Community	N	No	N	Yes	N
Hazard Awareness Program	Y	No	Y	No	Y
National Weather Service (NWS) Storm Ready	Y	No	N	No	N
Building Code Effectiveness Grading (BCEGs)	N	No	N	Yes	N
ISO Fire Rating	Multiple rural departments averaging 6-9 ISO	Yes - 8	4	Yes, 4	4
Economic Development Program	N	No	N	Yes	N
Public Education/Awareness	Y	No	Y	Yes	Y
Property Acquisition	N	No	N	Yes	N
Planning/Zoning Boards	N	No	Y	Yes	Y
Mutual Aid Agreements	Y	No	Y	Yes	Y
Studies/Reports/Maps					
Flood Insurance Maps	Y	Yes, 2011	Y	Yes, 2011	Y
FEMA Flood Insurance Study (Detailed)	Y	No	Y	Yes, 2011	Y
Evacuation Route Map	N	No	N	Yes	N
Critical Facilities Inventory	Y,2011	Yes, 2011	Y	Yes, 2011	Y
Vulnerable Population Inventory	N	No	N	No	N
Land Use Map	N	No	Y	Yes, 2016	Y
Staff/Department					
Building Code Official	N	No	Y	Yes	Y

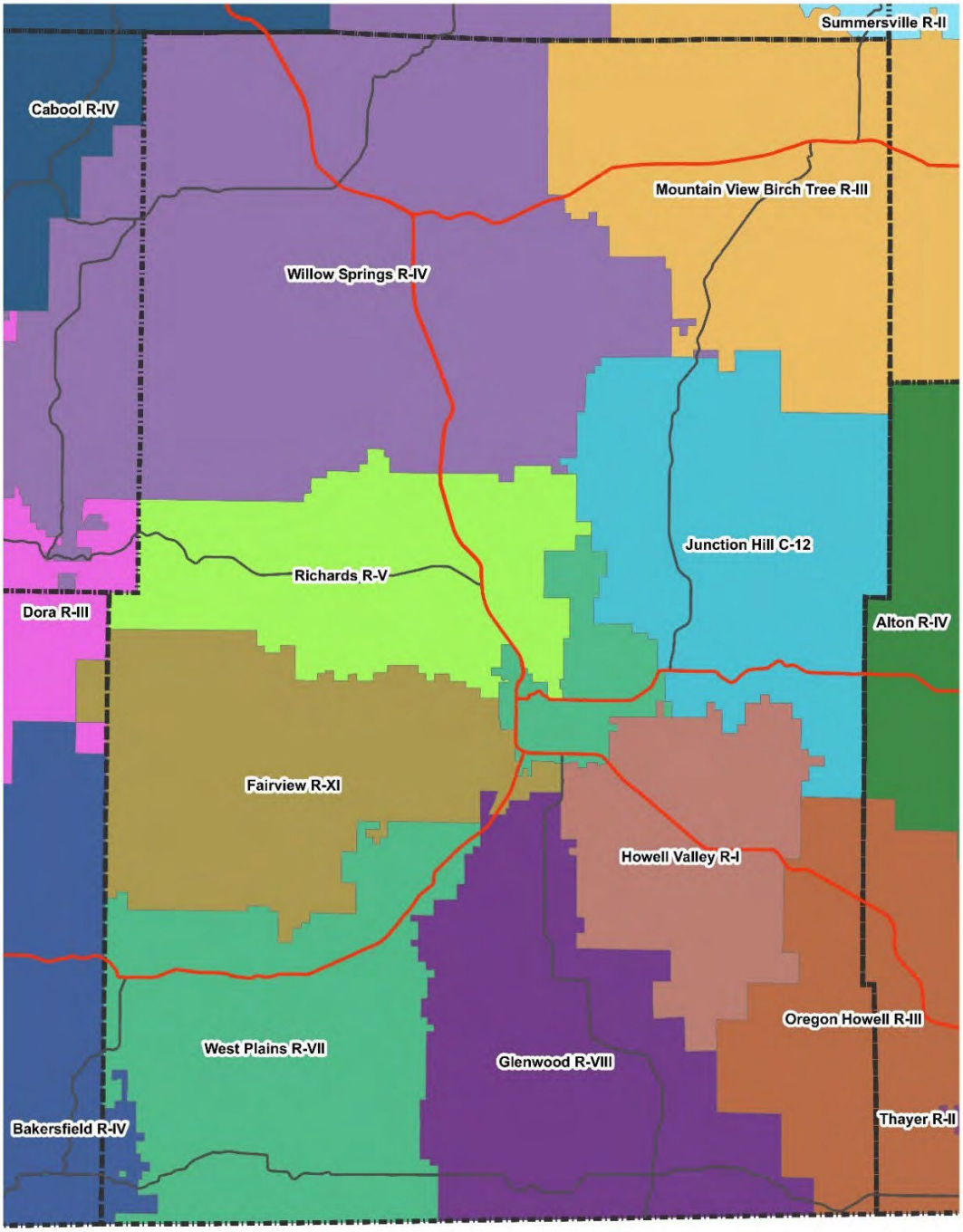
Building Inspector	N	No	Y	Yes	Y

CAPABILITIES	Howell County	Brandsville	Mountain View	West Plains	Willow Springs
Mapping Specialist (GIS)	Y	No	Y	Yes	Y
Engineer	N	No	N	Yes	N
Development Planner	N	No	Y	Yes	Y
Public Works Official	Y	Yes – Part Time	Y	Yes	Y
Emergency Management Director	Y	No	Y	Yes	Y
NFIP Floodplain Administrator	N	No	Y	Yes	Y
Emergency Response Team	Y	No	Y	Yes	Y
Hazardous Materials Expert	Y	No	N	Yes	N
Local Emergency Planning Committee	Y	No	Y	No	Y
Transportation Department	Y	No	Y	Yes	Y
Housing Authority	N	No	N	No	N
Local Funding Availability					
Ability to apply for CDBG Grants	Y	Yes	Y	Yes	Y
Authority to levy taxes for a specific purpose	Y	Yes	Y	Yes	Y
Fees for water, sewer, gas, or electric services	Y	Yes - Water	Y	Yes	Y
Impact fees for new development	N	No	Y	Yes	Y
Ability to incur debt through GO bonds	N	Yes	Y	Yes	Y
Ability to incur debt through special tax bonds	Y	Yes	Y	Yes	Y

2.2.6 Public School District Profiles and Mitigation Capabilities

This section provides general information about participating school districts in the Plan. There are eight school districts based in Howell County. Other school district boundaries include areas of Howell County (*Oregon-Howell R-III* is included in the Oregon County HMP) but is not headquartered and do not have facilities within the county. Figure 2.2 is a map of school district boundaries in Howell County.

Figure 2.2. Howell County School Districts



2.2.7 Fairview R-XI School District

All of Fairview R-XI School District facilities are just west of West Plains, in unincorporated Howell County.

Building Name	Address	Building Occupants
Fairview School	4036 State Route K	481

Fairview R-XI Schools are governed by a Board of Education consisting of the Board President and six board members. The District serves over 400 students and employees approximately 30 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

The District was awarded a Pre Disaster Mitigation Grant to construct a FEMA standard tornado saferoom in 2006. Table 2.12 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.12. Fairview R-XI School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	N	
Capital Improvement Plan	N	
School Emergency Plan	Y	2015
Weapons Policy	Y	2014
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Bldg. Principal
Emergency Manager	Y	Bldg. Principal
Grant Writer	Y	Bldg. Principal
Public Information Officer	N	
Information Technology	Y	Staff
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	Y	
General Obligation Bonds	N	
Special Tax Bonds	N	
Private Activities Donations	N	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.8 Glenwood R-VIII School District

All Glenwood R-VIII School District Facilities are located in unincorporated Howell County south of the City of West Plains on State Route 17.

Building Name	Address	Building Occupants
Glenwood School	10286 State Route 17	218

Glenwood R-VIII Schools are governed by a Board of Education consisting of the Board President and six board members. The District serves over 200 students and employees approximately 30 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

The District was awarded a Pre Disaster Mitigation Grant to construct a FEMA standard tornado saferoom in 2011. Table 2.13 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.13. Glenwood R-VIII School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	N	
Capital Improvement Plan	N	
School Emergency Plan	Y	2014
Weapons Policy	Y	2009
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Principal
Emergency Manager	N	
Grant Writer	N	
Public Information Officer	Y	Superintendent
Information Technology	N	
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	Y	
General Obligation Bonds	N	
Special Tax Bonds	N	
Private Activities Donations	Y	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	N	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.9 Howell Valley R-I School District

All of Howell Valley R-I School District Facilities are located in unincorporated Howell County southeast of the City of West Plains along Route ZZ.

Building Name	Address	Building Occupants
Howell Valley School	6461 State Route ZZ	215

Howell Valley R-I Schools are governed by a Board of Education consisting of the Board President and six board members. The District serves over 210 students and employees approximately 20 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

The District was awarded a Pre Disaster Mitigation Grant to construct a FEMA standard tornado saferoom in 2016. Table 2.14 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.14. Howell Valley R-I School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	N	
Capital Improvement Plan	Y	2007
School Emergency Plan	Y	2015
Weapons Policy	Y	2015
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	HS Principal
Emergency Manager	Y	Superintendent
Grant Writer	Y	Superintendent
Public Information Officer	Y	Superintendent
Information Technology	N	
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	N	
Local Funds	N	
General Obligation Bonds	N	
Special Tax Bonds	N	
Private Activities Donations	Y	
State and Federal Grant Funds	N	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.10 Junction Hill C-12 School District

All of Junction Hill C-12 School District Facilities are located in unincorporated Howell County east of the City of West Plains on County Road 3010.

Building Name	Address	Building Occupants
Junction Hill School	8004 County Road 3010	204

Junction Hill C-12 Schools are governed by a Board of Education consisting of the Board President and four board members. The District serves over 200 students and employees approximately 20 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

Table 2.15 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.15. Junction Hill School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	N	
Capital Improvement Plan	Y	2015
School Emergency Plan	Y	2015
Weapons Policy	Y	2014
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Superintendent
Emergency Manager	Y	Superintendent
Grant Writer	Y	Superintendent
Public Information Officer	Y	Superintendent
Information Technology	N	
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	Y	
General Obligation Bonds	Y	
Special Tax Bonds	N	
Private Activities Donations	N	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	y	
Tornado Shelter/Saferoom	N	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.11 Richards R-V School District

All of Richards R-V School District Facilities are located in the northern portion of the City of West Plains near the intersection of US 63 and County Road 1710.

Building Name	Address	Building Occupants
Richards School	3461 County Road 1710	364

Richards R-V Schools are governed by a Board of Education consisting of the Board President and six board members. The District serves over 360 students and employees approximately 30 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

The District was awarded a Pre Disaster Mitigation Grant to construct a FEMA standard tornado saferoom in 2008. Table 2.16 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.16. Richards R-V School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	N	
Capital Improvement Plan	N	
School Emergency Plan	Y	2015
Weapons Policy	Y	2015
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Principal
Emergency Manager	Y	Principal
Grant Writer	Y	Principal
Public Information Officer	Y	Superintendent
Information Technology	Y	Staff
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	Y	
General Obligation Bonds	N	
Special Tax Bonds	N	
Private Activities Donations	N	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.12 West Plains R-VII School District

The West Plains Elementary, Middle School and High School are located on the eastern side of the City of West Plains. The District also has the South Fork Elementary, located approximately seven miles southwest of the city.

Building Name	Address	Building Occupants
West Plains Elementary	1136 Allen Street	1,115
South Fork Elementary	3209 US Hwy 160	167
West Plains Middle School	730 East Olden	631
West Plains High School	602 East Olden	985

West Plains R-7 Schools are governed by a Board of Education consisting of the Board President and six board members. The District serves over 2500 students and employees approximately 125 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

There are tornado saferooms at South Fork Elementary and Middle School.

Table 2.17. West Plains R-7 School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	Y	2016
Capital Improvement Plan	Y	
School Emergency Plan	Y	2016
Weapons Policy	Y	2000
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Asst. Superintendent
Emergency Manager	Y	Asst. Superintendent
Grant Writer	N	
Public Information Officer	Y	Communications Director
Information Technology	Y	Staff
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	N	
Local Funds	Y	
General Obligation Bonds	Y	
Special Tax Bonds	Y	
Private Activities Donations	Y	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	Y	

Source: Data Collection Questionnaire

2.2.13 Willow Springs R-IV School District

All of Willow Springs R-IV District Facilities are located in the northern part of the City of Willow Springs.

Building Name	Address	Building Occupants
Willow Springs Elementary	215 W. 4th Street	494
Willow Springs Junior High	215 W. 4th Street	377
Willow Springs High School	215 W. 4th Street	389

Willow Springs Schools are governed by a Board of Education consisting of the Board President and five board members. The District serves over 1,100 students and employees approximately 30 teachers and staff. District departments include:

- Transportation
- Cafeteria Services
- Custodial Services
- Health Services
- Central Office

The District has a tornado saferoom on campus. The below table provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.18. Willow Springs R-IV School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	Y	2011
Capital Improvement Plan	Y	2016
School Emergency Plan	Y	2016
Weapons Policy	Y	
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Superintendent
Emergency Manager	Y	Superintendent
Grant Writer	N	
Public Information Officer	N	
Information Technology	N	
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	N	
General Obligation Bonds	N	
Special Tax Bonds	N	
Private Activities Donations	N	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

2.2.14 Missouri State University – West Plains

The MSU-West Plains campus is located in downtown West Plains. The 25-acre community college campus houses 15 buildings which include classrooms, student center and residence halls. The 2015 enrollment at MSU-WP was approximately 2,100 students.

There is a multi-purpose building on campus that is built of FEMA saferoom standards Table 2.19 provides responses from the Mitigation Planning Data Collection Questionnaire for School Districts.

Table 2.19. MSU-WP School District Mitigation Capabilities

Capability		
Planning Elements	**Y/N**	**Date of Latest Version**
Master Plan	Y	2014
Capital Improvement Plan	Y	2015
School Emergency Plan	Y	2015
Weapons Policy	Y	2013
Personnel Resources	**Y/N**	**Department/Position**
Full Time Building Official	Y	Director, Business and Support Services
Emergency Manager	Y	Director, Business and Support Services
Grant Writer	Y	Grant Development Specialist
Public Information Officer	Y	Director of University Communications
Information Technology	N	
Financial Resources	**Accessible/Eligible to Use?**	
Capital Improvement Project Funding	Y	
Local Funds	Y	
General Obligation Bonds	Y	
Special Tax Bonds	N	
Private Activities Donations	Y	
State and Federal Grant Funds	Y	
Other		**Status Including Date of Document or Policy**
Fire Evacuation Training	Y	
Tornado Sheltering Exercises	Y	
Public Address/EAS	Y	
NOAA Weather Radios	Y	
Tornado Shelter/Saferoom	Y	
Campus Police	N	

Source: Data Collection Questionnaire

Table 2.20. School Districts – Summary of Mitigation Capabilities

Capability	Fairview	Howell Valley	Glenwood	Junction Hill	Richards	West Plains	Willow Springs	MSU-WP
Planning Elements								
Master Plan/ Date	N	N	N	N	N	Y	Y	Y
Capital Improvement Plan/Date	N	Y	N	Y	N	Y	Y	Y
School Emergency Plan / Date	Y	Y	Y	Y	Y	Y	Y	Y
Weapons Policy/Date	Y	Y	Y	Y	Y	Y	Y	Y
Personnel Resources								
Full-Time Building Official	Y	Y	Y	Y	Y	Y	Y	Y
Emergency Manager	Y	Y	N	Y	Y	Y	Y	Y
Grant Writer	Y	Y	N	Y	Y	N	N	Y
Public Information Officer	N	Y	Y	Y	Y	Y	N	Y
Information Technology	Y	N	N	N	Y	Y	N	N
Financial Resources								
Capital Improvements Project Funding	Y	N	Y	Y	Y	N	Y	Y
Local Funds	Y	N	Y	Y	Y	Y	N	Y
General Obligation Bonds	N	N	N	Y	N	Y	N	Y
Special Tax Bonds	N	N	N	N	N	Y	N	N
Private Activities/Donations	N	Y	Y	N	N	Y	N	Y
State And Federal Funds/Grants	Y	N	Y	Y	Y	Y	Y	Y

Data Collection Questionnaires, 2021

3 RISK ASSESSMENT

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

The goal of the risk assessment is to estimate the potential loss in the planning area, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities and the school districts of Howell County to better understand their potential risk to the identified hazards. It will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten Howell County and provides a factual basis for elimination of hazards from further consideration;
- **Section 3.2 Assets at Risk** provides Howell County's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 3.3 Future Land Use and Development** discusses development that has occurred since the last plan update and any increased or decreased risk that resulted. This section also discusses areas of planned future development and any implications on risk/vulnerability
- **Section 3.4 Hazard Profiles and Vulnerability Analysis** provides more detailed information about the hazards impacting the planning area. For each hazard, there are three sections: 1) Hazard Profile provides a general description and discusses the threat to the planning area, the geographic location at risk, potential severity/magnitude/extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk; 2) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other jurisdictional assets at risk to natural hazards; and 3) Problem Statement briefly summarizes the problem and develops possible solutions.

Howell Co. Health Department and Emergency Operations Center – West Plains, MO

3.1 HAZARD IDENTIFICATION

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The Plan profiles all natural hazards that can affect Howell County. The natural hazards that can affect the county have been identified in the 2017 Howell County Plan and the 2018 Missouri State Plan. Natural hazards are naturally occurring climatological, hydrological, or geologic events that have a negative effect of people and the built environment. Natural hazards identified include:

- Riverine and Flash Flood
- Dam Failure
- Earthquake
- Land Subsidence/ Sinkholes
- Drought
- Extreme Temperatures
- Severe Thunderstorm/ High Winds/ Lightning/ Hail
- Severe Winter Weather
- Tornado
- Wildfire

3.1.1 Review of Existing Mitigation Plans

The Plan profiles all natural hazards that affect Howell County. The hazards identified in the 2017 Howell County Plan are identified in the 2018 Missouri State Plan. The State Plan also includes levee failure. Levee failure was excluded from the mitigation planning process as there are no mapped levees nor associated levee protected areas within or immediately upstream of Howell County.

Human-caused and technological hazards identified in the State Plan include:

- CBRNE Attack
- Civil Disorder
- Cyber Disruption
- Structural and Urban Fires
- Hazardous Materials
- Mass Transportation Accidents
- Nuclear Power Plants
- Public Health Emergencies/Environmental Issues
- Special Events
- Terrorism
- Utility Interruptions and System Failures

In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. It was determined to include only natural hazards. The MPC agreed that human-caused and technological hazards are addressed in a Regional Homeland Security Oversight Committee (RHSOC) Threat and Hazard Identification Risk Assessment (THIRA) and that including only natural hazards would meet the needs of local entities participating in the plan update. The THIRA was referenced during the update to assist SCOCOG staff in understanding the risk structure within Howell County.

3.1.2 Review Disaster Declaration History

Since 1953, FEMA has announced 17 disaster declarations that include since 1953, FEMA has announced 21 disaster declarations that include Howell County. Examples of these disasters include the following: severe storms, tornadoes, flooding, severe winter storms, a pandemic, and a hurricane evacuation. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, (PL 100-707) requires that all requests for a declaration by the President must be made by the governor of the affected state. State and federal officials conduct a Preliminary Damage Assessment (PDA) to show that the disaster is of such severity and magnitude that effective response is beyond state and local capabilities. Based on the governor's request, the president may declare that a major disaster or emergency exists, thus activating federal programs to assist in the response and recovery effort. Not all programs are activated for every disaster. Some declarations will provide only individual assistance or public assistance, while others provideboth.

FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.
(https://www.fema.gov/declaration-process)

The most recent disaster declaration occurred in 2020. **Table 3.1** lists the federal FEMA disaster declarations that included Howell County. Examples of these disasters include the following: severe storms, tornadoes, flooding, severe winter storms, a pandemic, and a hurricane evacuation. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

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FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.
https://www.fema.gov/declaration-process

Table 3.1. FEMA Disaster Declarations that included Howell County, Missouri, 1993-Present

Disaster Number	Description	Year of Declaration	Individual Assistance (IA) Public Assistance (PA)
4552	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	2020	PA
4490	COVID-19 PANDEMIC	2020	IA, PA
3482	COVID-19	2020	IA, PA
4317	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS AND FLOODING	2017	IA, PA
4250	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	1/21/2016	PA
3374	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	1/2/2016	PA
1980	SEVERE STORMS, TORNADOES, AND FLOODING	5/9/2011	PA
3317	SEVERE WINTER STORM	2/3/2011	PA
1847	SEVERE STORMS, TORNADOES, AND FLOODING	6/19/2009	PA
1822	SEVERE WINTER STORM	2/17/2009	PA
3303	SEVERE WINTER STORM	1/30/2009	PA
1809	SEVERE STORMS, FLOODING, AND A TORNADO	11/13/2008	IA, PA
1749	SEVERE STORMS AND FLOODING	3/19/2008	IA,PA
3281	SEVERE WINTER STORMS	12/12/2007	PA
1412	SEVERE STORMS, TORNADOES AND FLOODING	5/6/2002	IA, PA
1006	SEVERE STORMS, TORNADOES, AND FLOODING	12/1/1993	IA, PA
995	SEVERE STORMS & FLOODING	7/9/1993	IA, PA

Source: Federal Emergency Management Agency, https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants

3.1.3 Research Additional Sources

A variety of sources were researched for data on natural hazards. Primary sources included FEMA, State Emergency Management Agency (SEMA), National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA). The U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were major sources for earthquake information. The Missouri Department of Natural Resources (MDNR) Dam Safety Division provided information concerning dams and the Missouri Department of Conservation (MDC). Other information sources included county officials; existing city, county, regional and state plans; and information from local officials. The additional sources of data on locations and past impacts of hazards in Howell County include:

- Missouri Hazard Mitigation Plans (2013 and 2018)
- Previously approved planning area Hazard Mitigation Plan (2017)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (Hazus)
- Missouri Department of Transportation
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI);
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCEI documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the NCEI may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Those using information from NCEI should be cautious as the NWS does not guarantee the accuracy or validity of the information.

The NCEI damage amounts are estimates received from a variety of sources, including those listed above in the Data Sources section. For damage amounts, the NWS makes a best guess using all available data at the time of the publication. Property and crop damage figures should be considered as a broad estimate. Damages reported are in dollar values as they existed at the time of the storm event. They do not represent current dollar values.

The database currently contains data from January 1950 to September 2021, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

Injuries and deaths caused by a storm event are reported on an area-wide basis. A table resulting from an NCEI search by county, with a death or injury listed in connection with that search did not necessarily occur in that county.

3.1.4 Hazards Identified

Table 3.2. Hazards Identified for Each Jurisdiction

The natural hazards that may impact or have affected Howell County are profiled below. All hazards do not necessarily affect every jurisdiction participating in the same way. Table 3.2 provides a summary of the jurisdictions that may be affected by each hazard. An "x" in the table indicates that jurisdiction is affected by the hazard, and a "-", indicates the hazard is not applicable to that jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Temperature	Wildfire	Flooding (River and Flash)	Land Subsidence/Sinkholes	Severe Winter Weather	Thunderstorm/Lightning/Hail/High Wind	Tornado
Howell County	x	x	x	x	x	x	x	x	x	x
City of Brandsville	-	x	x	x	x	x	x	x	x	x
City of Mountain View	-	x	x	x	x	x	x	x	x	x
City of West Plains	-	x	x	x	x	x	x	x	x	x
City of Willow Springs	-	x	x	x	x	x	x	x	x	x
School Districts										
Fairview R-XI	-	x	x	x	x	x	x	x	x	x
Glenwood R-VIII	-	x	x	x	x	x	x	x	x	x
Howell Valley R-I	-	x	x	x	x	x	x	x	x	x
Junction Hill C-12	-	x	x	x	x	x	x	x	x	x
Missouri State Univ. – West Plains	-	x	x	x	x	x	x	x	x	x
Richards R-V	-	x	x	x	x	x	x	x	x	x
West Plains R-VII	-	x	x	x	x	x	x	x	x	x
Willow Springs R-IV	-	x	x	x	x	x	x	x	x	x

3.1.5 Multi-Jurisdictional Risk Assessment

The risk assessment assesses each participating jurisdiction's vulnerability to each hazard that can affect the planning area. Many of the hazards identified in the risk assessment have the same probability of occurrence throughout the planning area. The hazards that vary across the planning area in terms of risk include dam failure, flash flood, grass or wildland fire, river flood, and sinkholes/land subsidence. These differences are detailed in each hazard profile under geographic location and vulnerability.

Howell County is uniform in terms of climate, however, topography and building construction characteristics vary within the county. Howell County has experienced little growth in population and development from 2000 to the present. Mitigation capabilities of each jurisdiction are profiled in section 2.2.

The urbanized areas within the planning area, which have more assets at a greater density, have greater vulnerability to weather-related hazards, however, the vulnerability to future development can be mitigated through updated building codes and code enforcement as well as land use planning. These capabilities and resources to mitigate the impact of natural hazards vary across jurisdictions in the planning area. These differences will be discussed in greater detail in the vulnerability sections of each hazard.

3.2 ASSETS AT RISK

This section assesses Howell County population, structures, critical facilities and infrastructure, and other important assets that may be at risk of natural hazards. The inventory of assets for each jurisdiction were derived from parcel data from the Howell County Assessor, the Howell County Structures dataset downloaded from the Missouri Spatial Data Information Service (MSDIS), and local jurisdiction data collection questionnaires. The Missouri Mitigation Viewer was also referenced to ensure that total counts are accurate

3.2.1 Total Exposure of Population and Structures

Missouri Spatial Data Information Service (MSDIS) data was used for structure points and paired with Howell County Assessors data for values.

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2020 Census ACS Estimate data. Building counts

and building exposure values are based on parcel data developed by the State of Missouri Geographic Information Systems (GIS) database and the Howell County Assessor.

Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The multipliers were derived from HAZUS definitions and are defined below in **Table 3.3**

Land values have been purposely excluded from consideration because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Another reason for excluding land values is that state and federal disaster assistance programs generally do not address loss of land (other than crop insurance). It should be noted that the total valuation of buildings is based on county assessors' data which may not be current. In addition, government-owned properties are usually taxed

differently or not at all, and so may not be an accurate representation of true value. Note that public school district assets and special districts assets are included in the total exposure tables assets by community and county.

Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents, and estimated total exposure to parcels for the unincorporated county and each incorporated city. For multi-county communities, the population and building data may include data on assets located outside the planning area. **Table 3.4** provides the building value exposures for the county and each city in the planning area broken down by usage type. Finally, **Table 3.5** provides the building count total for the county and each city in the planning area broken out by building usage types (residential, commercial, industrial, and agricultural).

Table 3.3. Maximum Population and Building Exposure by Jurisdiction - 2021

Jurisdiction	2020 Population Estimate	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Howell County	40130	18,601	133,068,672	119,928,141	918,969
City of Brandsville	191	159	427,050	378,399	184,771,267
City of Mountain View	2663	1063	7,484,661	6,501,736	24,749,895
City of West Plains	12290	5649	88,384,446	76,082,286	291,254,056
City of Willow Springs	1902	984	10,883,734	10,191,133	15,789,930
Totals	**57176**	**26,456**	**240,248,563**	**213,081,695**	**517,484,117**

Source: U.S. Bureau of the Census, Building Count and Building Exposure, Missouri GIS Database from SEMA Mitigation Management; Contents Exposure derived by applying multiplier to Building Exposure based on Hazus MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Industrial (150%), Agricultural (100%). For purposes of these calculations, government, school, and utility were calculated at the commercial contents rate.

Table 3.4. Building Values/Exposure by Usage Type - 2021

Jurisdiction	Residential ($)	Commercial ($)	Agricultural ($)	Total ($)
Howell County	133,068,672	31,603,810	6,653,434	171,325,916
City of Brandsville	427,050	81,086	32,434	540,570
City of Mountain View	7,484,661	270,530	1,533,003	9,288,194
City of West Plains	88,384,446	15,526,997	4,777,538	108,688,981
City of Willow Springs	10,883,734	3,250,986	424,042	14,558,762
Totals	**240,248,563**	**50,733,409**	**13,420,451**	**304,402,423**

Source: Missouri GIS Database, Howell Co. Assessor, SEMA Mitigation Management Section

Table 3.5. Building and Parcel Counts by Usage Type - 2021

Jurisdiction	Residential Counts	Commercial Counts	Agricultural Counts	Total
Howell County	9,721	488	8,324	18,533
City of Brandsville	58	2	2	62
City of Mountain View	896	142	34	1072
City of West Plains	4,624	758	146	5,528
City of Willow Springs	829	111	47	987
Totals	**16,128**	**1501**	**8,553**	**26,182**

Source: Missouri GIS Database, Howell Co. Assessor, SEMA Mitigation Management Section; Public School Districts and Special Districts

Even though school district total assets are included in the tables above, additional discussion is needed, based on the data that is available from the districts' completion of the Data Collection Questionnaire and district-maintained websites. The number of enrolled students at the participating public-school districts is provided in Table 3.6 below. Additional information includes the number of buildings, building values (building exposure) and contents value (contents exposure).

Table 3.6. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Staff and Enrolment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Fairview R-XI	557	5	11,149,000	1,422,000	12,571,000
Glenwood R-VIII	265	1	7,000,000	1,000,000	8,000,000
Howell Valley R-I	222	8	7,394,000	718,000	8,112,000
Junction Hill C-12	219	3	5,546,000	838,000	6,384,000
Missouri State Univ. – West Plains	2,100	19	41,756,000	9,945,000	51,701,000
Richards R-V	385	4	9,274,000	1,131,000	10,405,000
West Plains R-VII	2,561	28	62,992,000	10,460,000	73,452,000
Willow Springs R-IV	1,279	20	26,397,000	2,582,000	28,979,000

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx., select the file for the most recent year called "20xx Building Enrollment PK-12", filter the spreadsheet by selecting only the public school districts in the planning area. The Building Exposure, Contents Exposure, and Total Exposure amounts come from the completed Data Collection Questionnaires from Public School Districts. In general, the school districts obtain this information from their insurance coverage amounts.

3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, essential, high potential loss, and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

- Critical Facility: Those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- Essential Facility: Those facilities that if damaged, would have devastating impacts on disaster response and/orrecovery.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community.
- Transportation and lifeline facilities: Those facilities and infrastructure critical to transportation, communications, and necessary utilities.

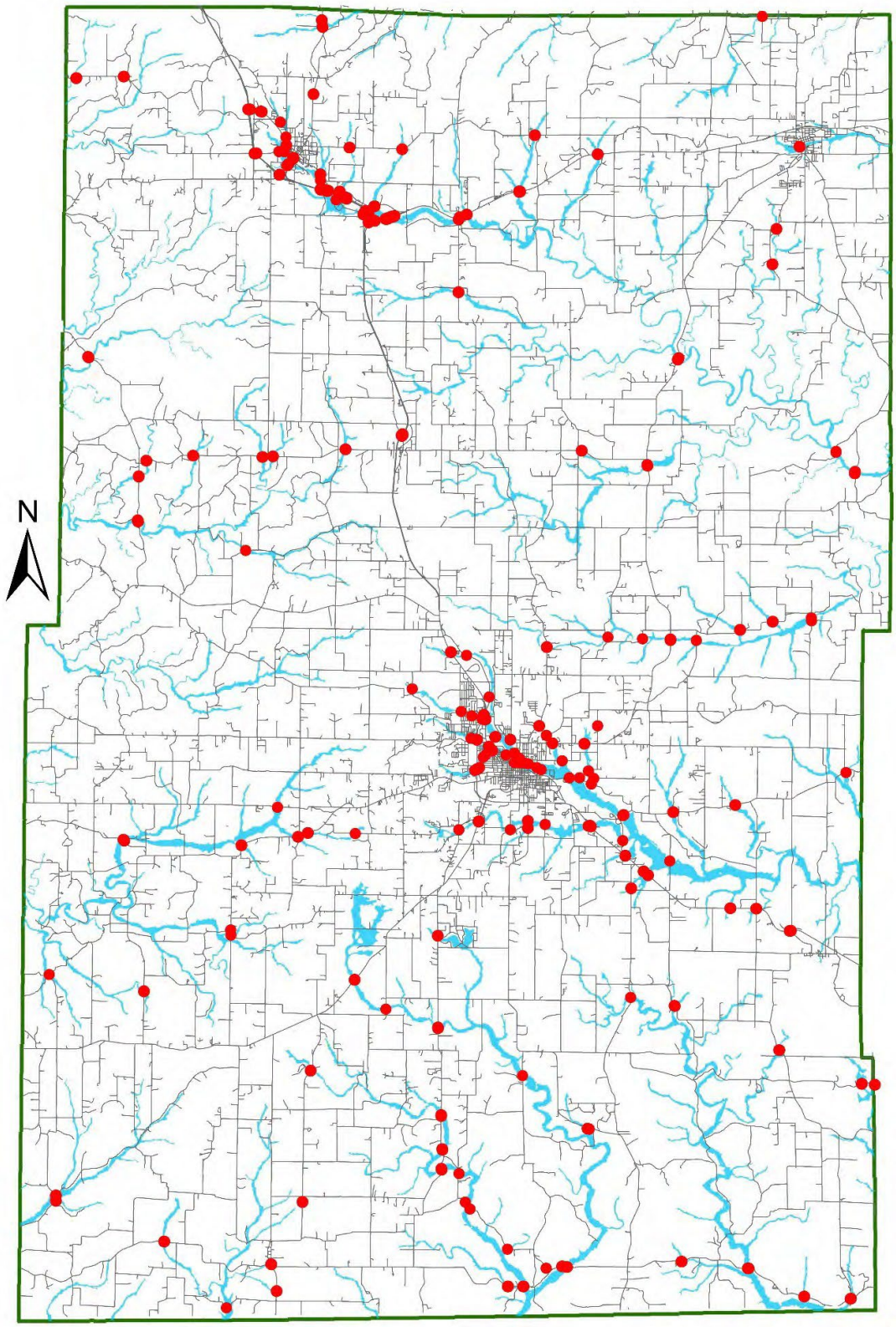
Table 3.7 on page 3.12 includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area. The list was compiled from the Data Collection Questionnaire.

Table 3.7. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Howell County	1	0	2	41	2	0	7	0	5	138	0	0	0	2	0	6	Y	0	6	0	0	0	**210**
City of Brandsville	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	2	Y	1	0	0	0	0	**6**
City of Mountain View	1	0	3	5	3	1	1	2	0	6	3	0	0	2	1	4	N	1	2	0	0	1	**36**
City of West Plains	0	1	7	9	4	1	3	7	3	33	12	1	1	6	2	13	Y	9	7	2	0	1	**122**
City of Willow Springs	1	0	2	4	2	0	1	2	1	12	3	0	0	2	1	5	Y	3	3	0	0	1	**43**
Totals	**3**	**1**	**14**	**60**	**11**	**2**	**13**	**12**	**9**	**189**	**18**	**1**	**1**	**12**	**4**	**30**	**0**	**14**	**18**	**2**	**0**	**3**	**417**

Source: Missouri 2018 State Hazard Mitigation Plan and Hazard Mitigation Viewer; Data Collection Questionnaires; Hazus, etc.

Figure 3.1. Howell County Bridges



A bridge's scour index is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered "scour critical", or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition. According to the data provided by the Missouri Department of Transportation, there are no "scour critical" bridges in Howell County, Missouri.

Travelway	Body of Water	Classification	Scour Index
-	-	-	-

3.2.3. Other Assets

Assessing the vulnerability of the planning area to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons.

- These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters.
- Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

Table 3.8. Threatened and Endangered Species in Howell County, Missouri

Common Name	Scientific Name	Status
Gray Bat	Myotis grisescens	Endangered
Indiana Bat	Myotis sodalist	Endangered
Northern Long-Eared Bat	Myotis septentrionalis	Threatened
Ozark Hellbender	Cryptobranchus alleganiensis bishopi	Endangered
Decurrent false aster	Boltonia decurrens	Threatened
Virginia Sneezeweed	Helenium virginicum	Threatened

Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html;

Natural Resources:

Table 3.9. Parks in Howell County

Area Name	Address	City
Cover Prairie CA	Route F	Pomona
Dean Davis CA	County Road 2420	Pomona
Sims Valley Community Lake	Route RA	Willow Springs
Tingler Prairie CA	County Road 8110	West Plains
Vanderhoeff State Forest	County Road 8110	Moody
White Ranch CA	County Road 8390	Lanton

http://mdc4.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s

Park Name	Address	City
Buck Park	North Route BB	West Plains
Children's Park	West Broadway Ave	West Plains
Galloway Park	Girdley Street	West Plains
People's Park	Porter Wagoner Blvd	West Plains
City Park & Pool	West 10th St	Willow Springs

Source: MDC, Data Collection Questionnaires

Historic Resources: The National Register of Historic Places is the official list of registered cultural resources worthy of preservation. It was authorized under the National Historic Preservation Act of 1966 as part of a national program. The purpose of the program is to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering, and culture.

Table 3.10. Howell County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Courthouse Square Historic District	Court Sq.	West Plains	2003
Elledge Arcade Building	28 Court Sq.	West Plains	2001
International Shoe Co. Building	665 Missouri Ave	West Plains	2011
Mt. Zion Masonic Temple	304 E. Main Street	West Plains	2011
Smith Building	113 Washington Ave	West Plains	2001
West Plains Bank Building	107 Washington Ave	West Plains	2001

Source: Missouri Department of natural Resources – Missouri National Register Listings by County http://dnr.mo.gov/shpo/mnrlist.htm

Economic Resources:

Table 3.11. Major Non-Government Employers in Howell County

Employer Name	Main Locations	Product or Service	Employees
Armstrong Wood Products	West Plains	Wood Products	250+
DRS Technologies	West Plains	Military Equip.	250+
Ozark Medical Center	West Plains	Healthcare	250+
Systems & Electronics Inc.	West Plains	Military Equip.	250+
WalMart	West Plains	Retail	250+

Source: Data Collection Questionnaires; local Economic Development Commissions

Agriculture

Table 3.12. Agriculture-Related Sales in Howell County

Value of Sales by Commodity Group	State Rank (out of 114)
Sheep, goats, wool, mohair and milk	2
Cattle and calves	4
Milk from cows	27
Poultry and eggs	30

Source: 2016 Missouri Agricultural Census

Table 3.13. Top Livestock Inventory Items

Livestock Inventory	State Rank (out of 114)
Goats, all	3
Cattle and calves	6
Sheep and lambs	6
Turkeys	21

Source: 2016 Missouri Agricultural Census

3.3 LAND USE AND DEVELOPMENT

3.3.1 Development Since Previous Plan Update

Table 3.14. County Population Growth, 2010-2020

Jurisdiction	Total Population 2010	Population Estimate 2020	2010-2020 # Change	2000-2020 % Change
Howell County	40,400	40,130	-270	-0.6%
City of Brandsville	161	191	+30	18.6%
City of Mountain View	2,719	2,663	-56	-2.0%
City of West Plains	11,986	12,290	+304	2.5%
City of Willow Springs	2,184	1,902	-282	-13.0%

Source: U.S. Bureau of the Census, Decennial Census, 2019 Population Estimates, American Community Survey 5-year Estimates; Population Statistics are for entire incorporated areas as reported by the Census bureau

Table 3.15. Change in Housing Units, 2010-2020

Jurisdiction	Housing Units 2010	Housing Units 2020	2010-2020 # Change	2000-2020 % Change
Howell County	18021	18312	-291	-0.02
City of Brandsville	79	79	0	0.00
City of Mountain View	1194	1161	33	0.03
City of West Plains	5509	5566	-57	-0.01
City of Willow Springs	1082	947	135	0.12

Source: U.S. Bureau of the Census, Decennial Census, American Community Survey 5-year Estimates; Population Statistics are for entire incorporated areas as reported by the U.S. Census Bureau

3.3.2 Future Land Use and Development

Unincorporated Howell County has seen good population growth over the last ten years. Most of the new development is the county is taking place in locations just outside the county's largest city, West Plains. The most sparsely population portions of the county include the northwest, and south-central. Figure 3.2 depicts the geographic location of population density in Howell County.

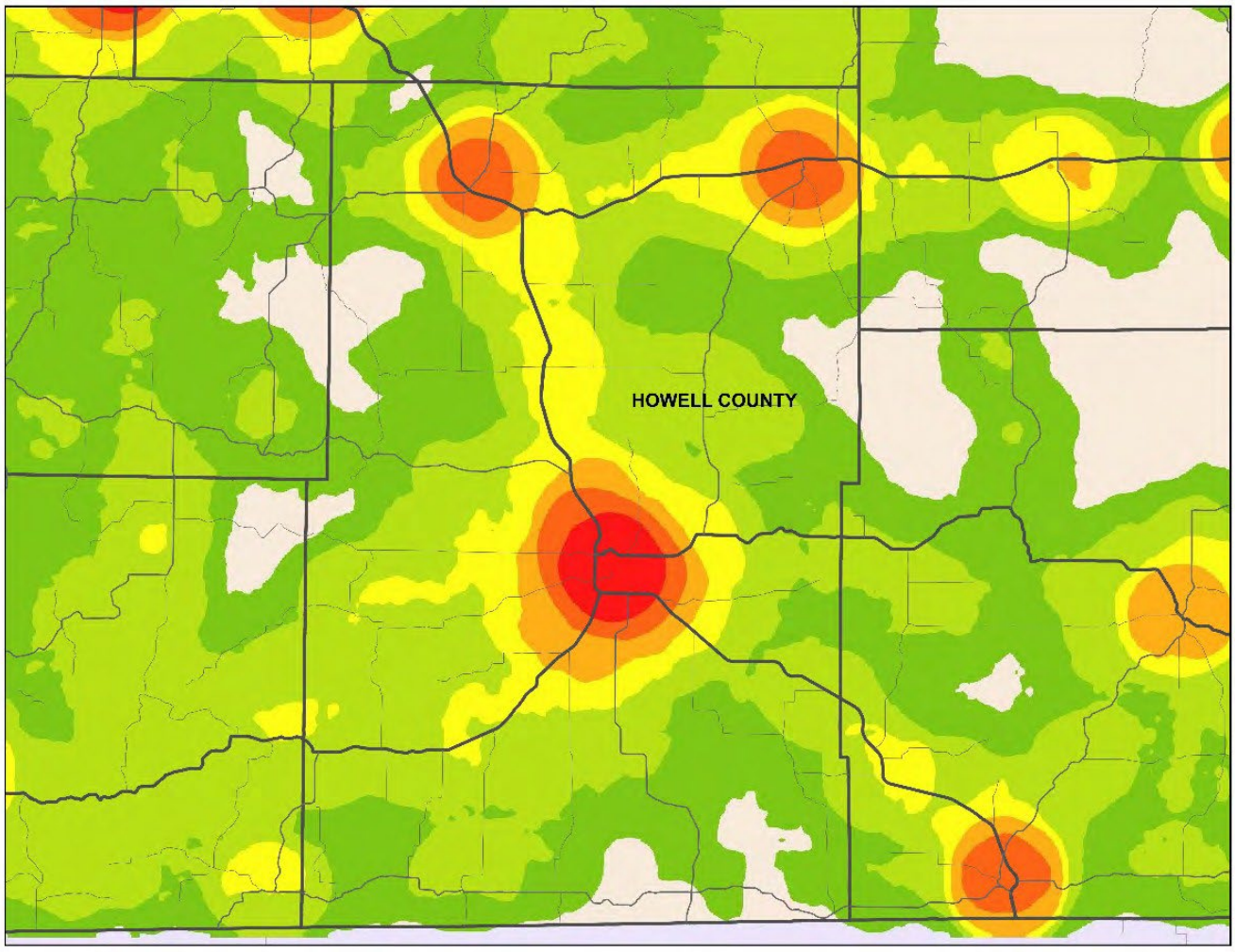
The City of Brandsville

The City of Brandsville currently has no comprehensive plan. Brandsville experienced an 8 percent decrease in population from 2000 to 2019. Little-to-no development has taken place in the community over the last ten years, as the population ages and relocates to nearby larger communities. The Brandsville Volunteer Fire Department has recently submitted an application in Missouri Community Development Block Grant to construct a new firehouse to replace the existing structure that has major structural deficiencies. It is expected that any additional growth inside the city limits of Brandsville will continue to occur along US Highway 63 or Main Street (State Route VV).

The City of West Plains

The City of West Plains updated their comprehensive plan in 2015. The city experienced a 9.5% population increase between the years of 2000 and 2019. West Plains is a growing community that serves as the commercial, industrial, and services hub for the South Central Region. The city also maintains the most capacity in terms of emergency preparedness and emergency response. Primary commercial growth centers in West Plains are located in the southern portion of the community along US Highway 63 and US Highway 160 (Preacher Roe Boulevard). Residential growth is occurring in areas just outside the city limits and in the western and northwestern sections of the city. The growth in West Plains is expected to remain constant in the coming years, if not increase. Growth areas of the community will continue to be the southern and western quadrants.

Figure 3.2. Population Density in Howell County and Surrounding Areas



The City of Mountain View

The City of Mountain View does have a Comprehensive Plan on file; however, it was last updated in 2001. The City experienced a slight decline in population from 2010 to 2020, showing a negative two percent growth rate. Commercial and industrial growth is planned to take place on the eastern portion of the center near the US Highway 60 and MO Route 17 interchange. Residential development is expected to occur on the northern and western portion of town. The city has had major problems with surface water and flash flooding in the older parts of town.

The City of Willow Springs
The City of Willow Springs does have a Comprehensive Plan on file; however, it was last updated in 1993. The City experienced slow growth between the years 2000 and 2019, showing a 1.8 percent growth rate. Commercial and industrial growth is planned to take place on the eastern portion of the center near the US Highway 60 and US Highway 63 interchange. Residential development is expected to occur on the northern and western portion of town. The city has had some problems with flooded roadways in the residential areas on the west side of the community, perhaps requiring future mitigating actions.

Fairview R-XI School District
The district has a FEMA saferoom on campus.

Glenwood R-VIII School District
The district has a FEMA saferoom on campus.

Howell Valley R-I School District
The district has a FEMA saferoom on campus.

Junction Hill C-12 School District
General safety drills are incorporated through the school resource office annually. Junction Hill does not have a FEMA saferoom on campus, but would like to construct one if funding becomes available.

Richards R-V School District
General safety drills are incorporated through the school resource office annually. Richards has a FEMA saferoom on campus.

West Plains R-VII School District
The school district has one FEMA saferoom, located at the middle school, which is adjacent to the High School on Olden Street. The district was recently awarded a grant to construct a safe room at the elementary school (February 2022) but the project is in jeopardy due to cost overruns in the construction bidding process. The High School has recently replaced its roof to mitigate substantial leaking during periods of heavy rainfall.

Willow Springs R-IV School District
Training for faculty, staff, and students annually for hazards occur for emergency preparedness. The district has a FEMA saferoom located at the elementary school but would like to acquire grant funding to construct another saferoom to protect students and faculty at the middle school building, which is located too far away from the existing saferoom to be effective.

Missouri State University – West Plains
The campus has emergency protocols in place along with emergency maps in the event of a disaster or critical situation. They also have back-up servers if they were to be damaged. The campus also has a FEMA saferoom available for students and adjacent neighborhoods, located at: 323 West Trish Knight Street, West Plains.

3.4 HAZARD PROFILES, VULNERABILITY, AND PROBLEM STATEMENTS

Each hazard will be analyzed individually in a hazard profile. The profile will consist of a general hazard description, location, strength/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could impact risk. At the end of each hazard profile will be a vulnerability assessment, followed by a summary problem statement.

Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The level of information presented in the profiles will vary by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include the information categorized as follows:

Hazard Description: This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.

Geographic Location: This section describes the geographic location of the hazard in the planning area. Where available, use maps to indicate the specific locations of the planning area that are vulnerable to the subject hazard. For some hazards, the entire planning area is at risk.

Severity/Magnitude/Extent: This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

Previous Occurrences: This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

Changing Future Conditions Considerations: In addition to the probability of future occurrence, changing future conditions are considered, including the effects of long-term changes in weather patterns and climate on the identified hazards. This analysis is provided by the National Oceanic and Atmospheric Administration (NOAA)

VulnerabilityAssessments

Requirement §201.6(c)(2)(ii) :[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A) :The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B) :[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments should be based on the best available data, including data collected from the 2018 State Hazard Mitigation Plan.

The vulnerability assessments in this plan will also be based on:

- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans andreports;
- Personal interviews with planning committee members and other stakeholders; and,
- Other sources as cited.

In the Vulnerability Assessment, the following sub-headings will be addressed:

- **Vulnerability Overview:** An overall summary of each jurisdiction's vulnerability to the identified hazards. The overall summary of vulnerability identifies structures, systems, populations, or other community assets as defined by the community that are susceptible to damage and loss for hazard events.
- **Potential Losses to Existing Development:** Includes the types and numbers of building and critical facilities.
- **Previous and Future Development:** This section will include information on how changes in development have impacted the community's vulnerability to this hazard. It also includes a description of how changes in development that occurred in known hazard prone areas since the previous plan have increased or decreased the community's

vulnerability, and any anticipated future development in the county, and how that would impact hazard risk in Howell County.

- **Hazard Summary by Jurisdiction:** For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation. For example, a community that has adopted more recent building codes and constructed safe rooms would be less vulnerable to the impact of tornados.

Problem Statements

Each hazard analysis will conclude with a brief summary of the problems created by the hazard in Howell County, and possible ways to resolve those problems. Jurisdiction-specific information in those cases where the risk varies across Howell County is included.

3.4.1 Flooding (Riverine and Flash)

Hazard Profile

Hazard Description

A flood is partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms "base flood" and "100- year flood" refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP), and can also happen in areas not associated with floodplains.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding. In certain areas, aging storm sewer systems were not designed to carry the capacity currently needed to handle the increased

storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems has increased the warning time for flash floods.

Geographic Location

Riverine and Flash flooding is most likely to occur in Special Flood Hazard Areas (SFHAs) where the 1% chance floodplain has been mapped. Areas along Howell Creek and the Eleven Point River, specifically, the City of West Plains and Willow Springs, and developed parts of the unincorporated county experience the greatest impact of flooding. According to NCEI storm event data from 2000 through 2020 there were 25 riverine flood events and 35 flash flood events recorded in the county during this period. These events are typically regional in nature and affect rivers, streams, and tributaries across a wide area. Figures 3.3 through 3.6 are mapped Special Flood Hazard Areas for at risk communities in Howell County.

According to NCEI storm event data from 2017 through 2021, there were 39 riverine flood events and 13 flash flood events recorded in the county during this period.

Table 3.16. Howell County NCEI Flood Events by Location, 2017-2021

Location	# of Events
Howell County	36
City of Brandsville	0
City of Mountain View	1
City of West Plains	1
City of Willow Springs	1
Total Unique Events	**39**

Source: National Centers for Environmental Information, 2021

The NCEI storm event data lists flash flood events according to the nearest community or place. Most of these events cover larger areas than the smaller geographic areas reported in the data. Although some events may not be inside the corporate limits of the community identified in the narrative, they are in such proximity that the community named would be the most affected by impassible roads. It is safe to assume that numerous low water crossings would be impacted by heavy rains that exacerbate flash flooding across the county. In addition, multiple records are related to the same event and vice versa.

Table 3.17. Howell County Flash Flooding Events by Location, 2017-2021

Location	# of Events
Howell County	7
City of Brandsville	0
City of Mountain View	2
City of West Plains	4
City of Willow Springs	0
Total Unique Events	**13**

Source: National Centers for Environmental Information, 2021

Figure 3.3. Howell County SFHAs with Critical Facilities

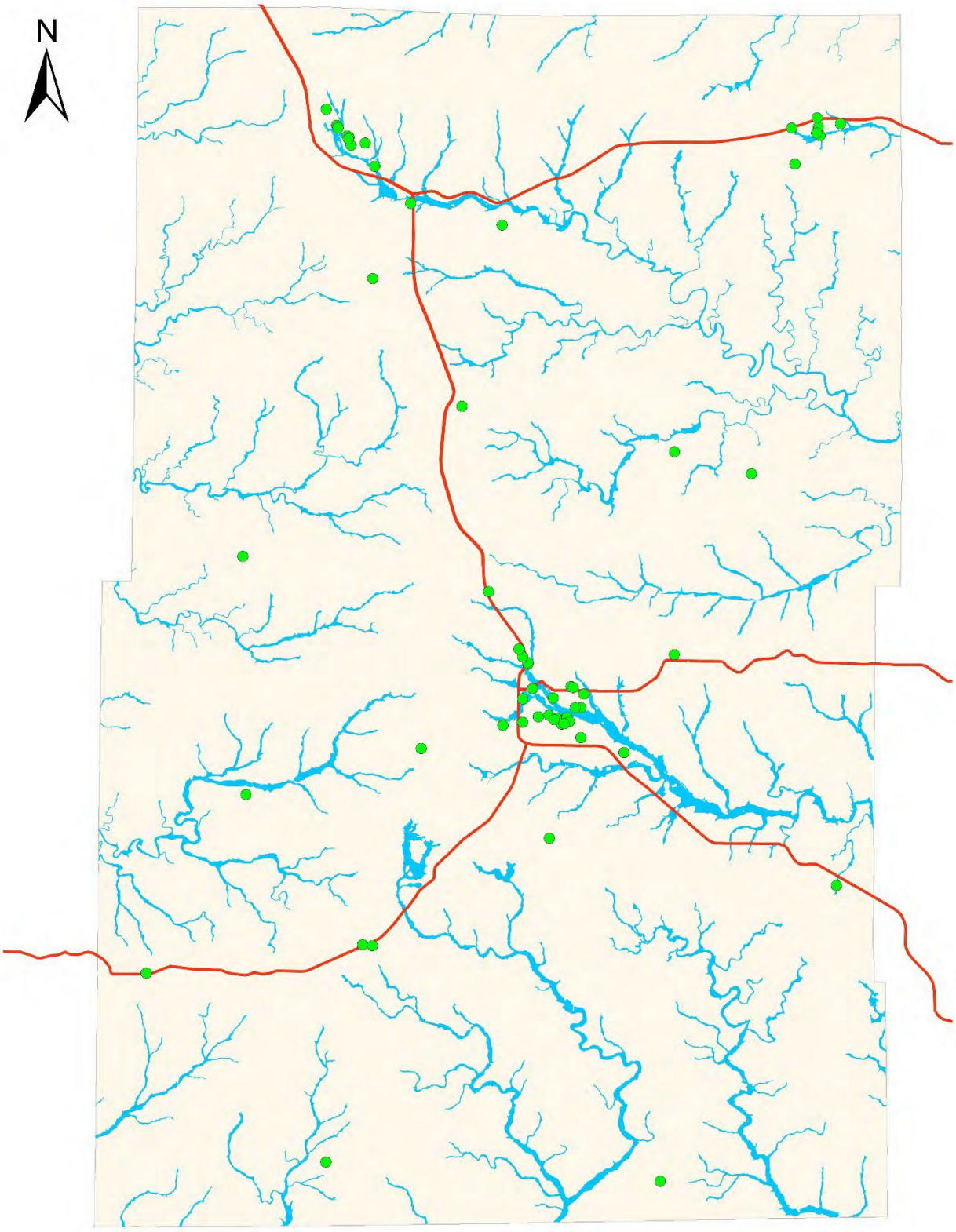
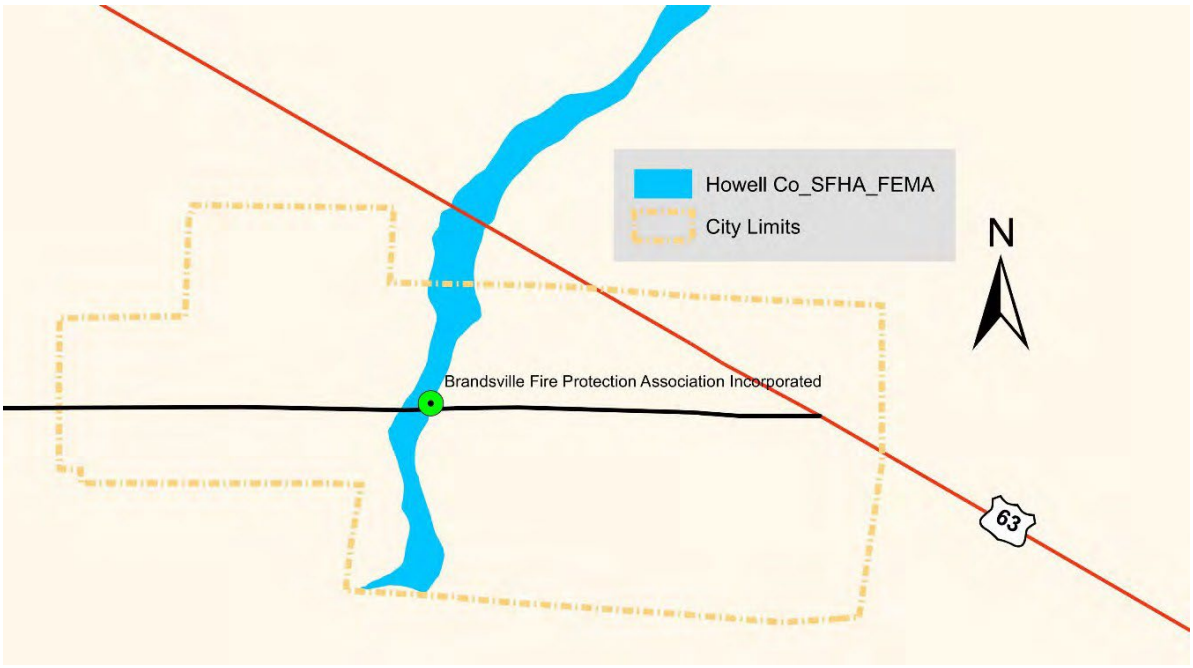


Figure 3.4. City of Brandsville Special Flood Hazard Areas with Critical Facilities



As of October 2016, the Brandsville Rural Fire Department has received funding from Community Development Block Grant to construct a new fire station near the intersection of Main Street and US Route 63, which will be located outside of the FEMA Special Flood Hazard Area.

Figure 3.5. City of Mountain View SFHA with Critical Facilities

Figure 3.6. City of West Plains SFHA with Critical Facilities

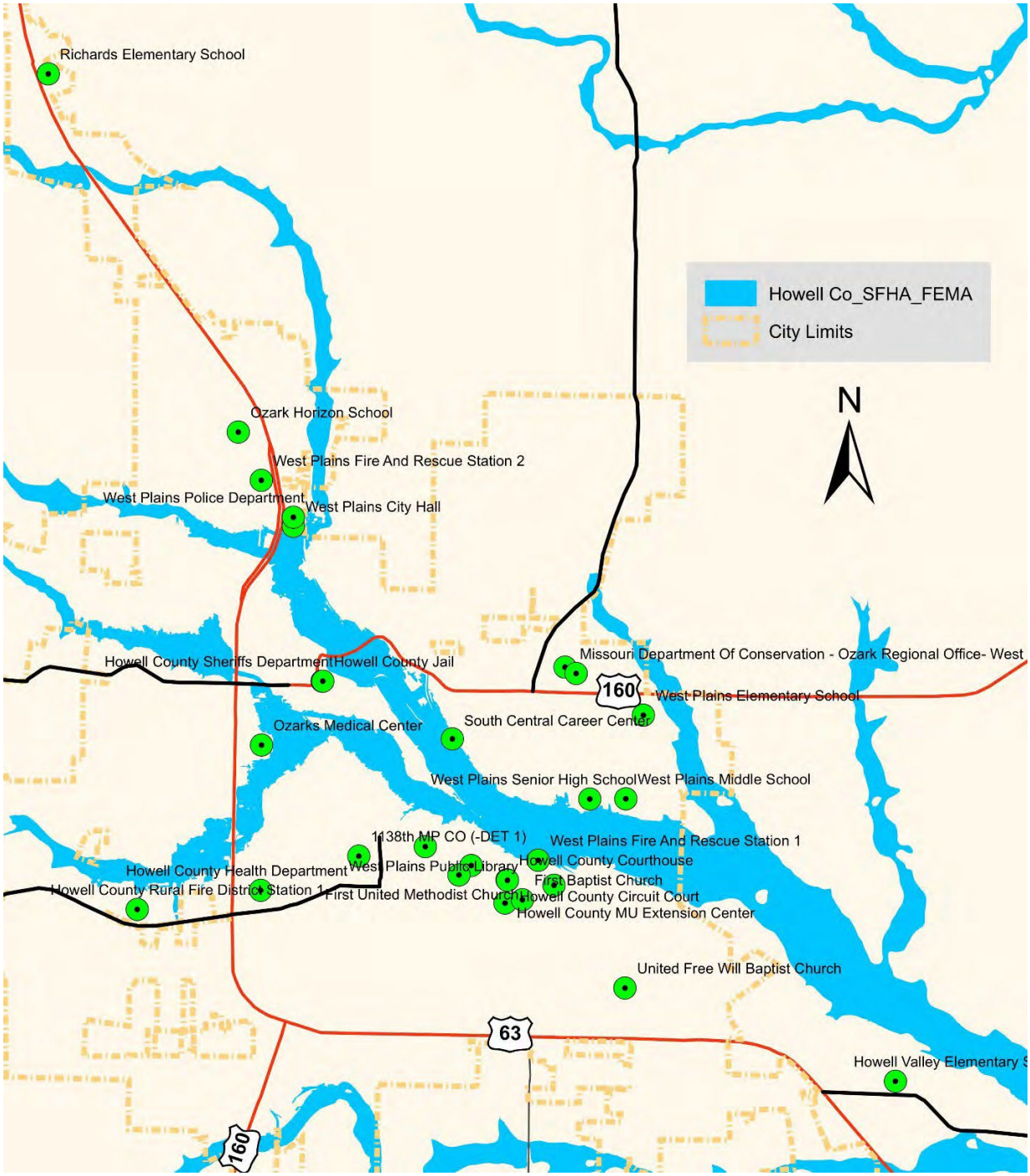
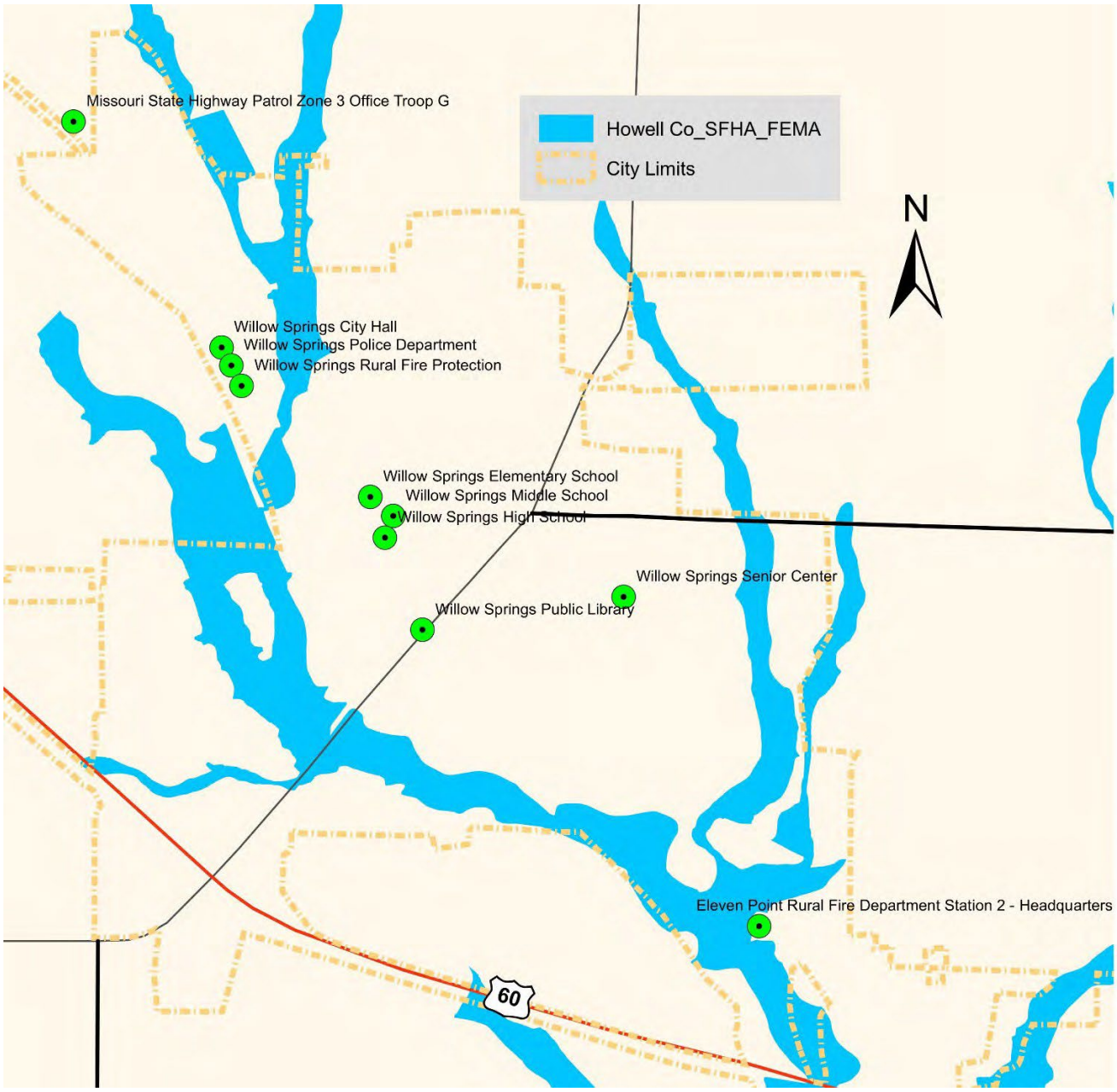


Figure 3.7. City of Willow Springs SFHA with Critical Facilities



Strength/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2018 State Hazard Mitigation Plan. Flooding along Missouri's major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing communities downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

Flooding presents a danger to life and property, often resulting in injuries, and in some cases, fatalities. Floodwaters themselves can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture as a result of flood activity. Examples are bulk propane tanks. When this happens, evacuation of citizens is necessary.

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology concerns) may be necessary.

When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Floodwaters can also cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. Flooding at low water crossings is extremely hazardous to public safety. Motorists can easily be swept from the roadway when they attempt to cross flooded roads resulting in water rescues, loss of property, and fatalities.

According to the U.S. Geological Survey, two critical factors affect flooding due to rainfall: rainfall duration and rainfall intensity – the rate at which it rains. These factors contribute to a flood's height, water velocity and other properties that reveal its magnitude.

National Flood Insurance Program (NFIP) Participation

Table 3.18 provides details on NFIP participation for the communities in the planning area. Table 3.18 contains the number of policies in force, amount of insurance in forces, number of closed losses, and total payments for each effected jurisdiction. The time represented by the 41 closed losses is from 1978 through August 2021. The City of Brandsville and Howell County's Participation in the NFIP is currently sanctioned due to non-compliance with the local floodplain ordinance.

Table 3.18. NFIP Participation in Howell County

Community ID	Community Name	NFIP Participant (Y/N/Sanctioned)	Current Effective Map Date	Regular- Emergency Program Entry Date
290806	Howell County	S	7/4/11	S - 7/4/2012
290914	City of Brandsville	S	7/4/11	S - 7/4/2012
290165	City of Mountain View	Y	7/4/11	8/1/80
290166	West Plains, City of	Y	7/4/11	5/19/81
290167	Willow Springs, City of	Y	7/4/11	8/15/79

Source: NFIP Community Status Book, 2022; BureauNet, http://www.fema.gov/national-flood-insurance-program/national- flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

Table 3.19. NFIP Policy and Claim Statistics as of Date

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
City of Mountain View	3	$1,000,000	1	$1885
City of West Plains	50	$15,028,700	59	$1,050,490
City of Willow Springs	14	$1,739,800	13	$14,838

Source: NFIP Community Status Book, 4/15/2022; BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html; *Closed Losses are those flood insurance claims that resulted in payment.

The City of West Plains shows the most insurance payments with 59 closed losses at a value of $1,050,490

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined total of 0 repetitive loss properties.

Severe Repetitive Loss (SRL): A SRL property is defined it as a single family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP; and has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $1,000 and with cumulative amounts of such claims payments exceeding $20,000; or (2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

There is one Severe Repetitive Loss Property in Howell County, it is located in West Plains and has three (3) documented losses with a total payment amount of $594,130.73.

Previous Occurrences

According to NCEI storm even data, there have been thirteen (13) flash flood events recorded in Howell County from 2017 through 2021. One of these events, occurring on April 29, 2017, resulted in reported property damage of $60,000,000 and is described in NCEI narratives as follows:

Table 3.20. NCEI Howell County Flash Flood Events Summary, 2017 to 2021

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2017	3	0	0	$60,000,000	0
2018	1	0	0	$0	0
2019	3	0	0	$0	0
2020	2	0	0	$10,000	0
2021	4	0	0	$20,000	0
TOTAL	**13**	**0**	**0**	**$60,030,000**	**0**

Source: NCEI, 2022

Table 3.21. NCEI Howell County Riverine Flood Events Summary, 2017 to 2021

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2017	9	0	0	$0	$0
2018	8	0	0	$0	$0
2019	8	0	0	$0	$0
2020	11	0	0	$10,000	$0
2021	3	0	0	$0	$0
TOTAL	**39**	**0**	**0**	**$10,000**	**$0**

Source: NCEI, 2022

Probability of Future Occurrences

There have been a total of 52 unique flood events in Howell County from 2017 to 2021 in the NCEI storm event database. Of those, 13 have been flash floods and the remaining 39 have been considered riverine flooding. Using a six period of record, this equates to 7.4 flood events per year and a 100% probability of occurrence in the county in any given year. Using the same period of record, the probably of occurrence of riverine flooding inside Howell County is 100%.

Changing Future Conditions Considerations

With changing climate conditions comes more uncertainty and less predictability for hazard events. An overall increasing global temperature is likely to lead to increased precipitation and intense rainstorms. Over the last fifty-years, the average annual precipitation in most of the Midwest has increased by 5- 10%; however, rainfall during the four wettest days of the year has increased nearly 35%. The amount of water flowing in most streams during the worst flood of the year has increased by more than 20%.

The National Climate Assessment states that extreme rainfall events and flooding have increased in the last century and that those trends are expected to continue. Heavy rain events are likely to cause erosion, diminished water quality, and negative impacts on transportation, agriculture, human health, and infrastructure.

Vulnerability

Vulnerability Overview

Flooding has been included in 10 of the 16 presidential natural disaster declarations that have included Howell County. Periods of heavy rain falling at the rate of one inch per hour floods low water crossings throughout the county making many roads impassable. This creates a severe threat to motorists that attempt to drive through flood waters over the roadway. Riverine flooding occurs less frequently than flash flooding. Spaces in low lying areas outsides the identified floodplain are frequently flooding. Street flooding over roadways has been reported in the Cities of Mountain View, West Plains and Willow Springs, and in unincorporated Howell County. There are no school district facilities in SFHAs in Howell County. Increases in development add to surface runoff and can potentially exacerbate flash flooding in areas that previously have not experienced flooding.

Potential Losses to Existing Development

Flood loss estimates were developed using a GIS methodology. A county-wide structures layer development by the University of Missouri in partnership with regional planning commissions across the state was overlaid on FEMA DFIRM maps to show number of structures and structure types situated inside Special Flood Hazard Areas.

An average valuation from the Howell County Assessor for each structure type: Residential, Commercial, or Agriculture was applied to the structures in identified SFHAs. A review of GIS data indicate that no school district facilities in Howell County are located in the FEMA SFHA.

Table 3.22. Potential Flood Losses for Building Types by Jurisdiction

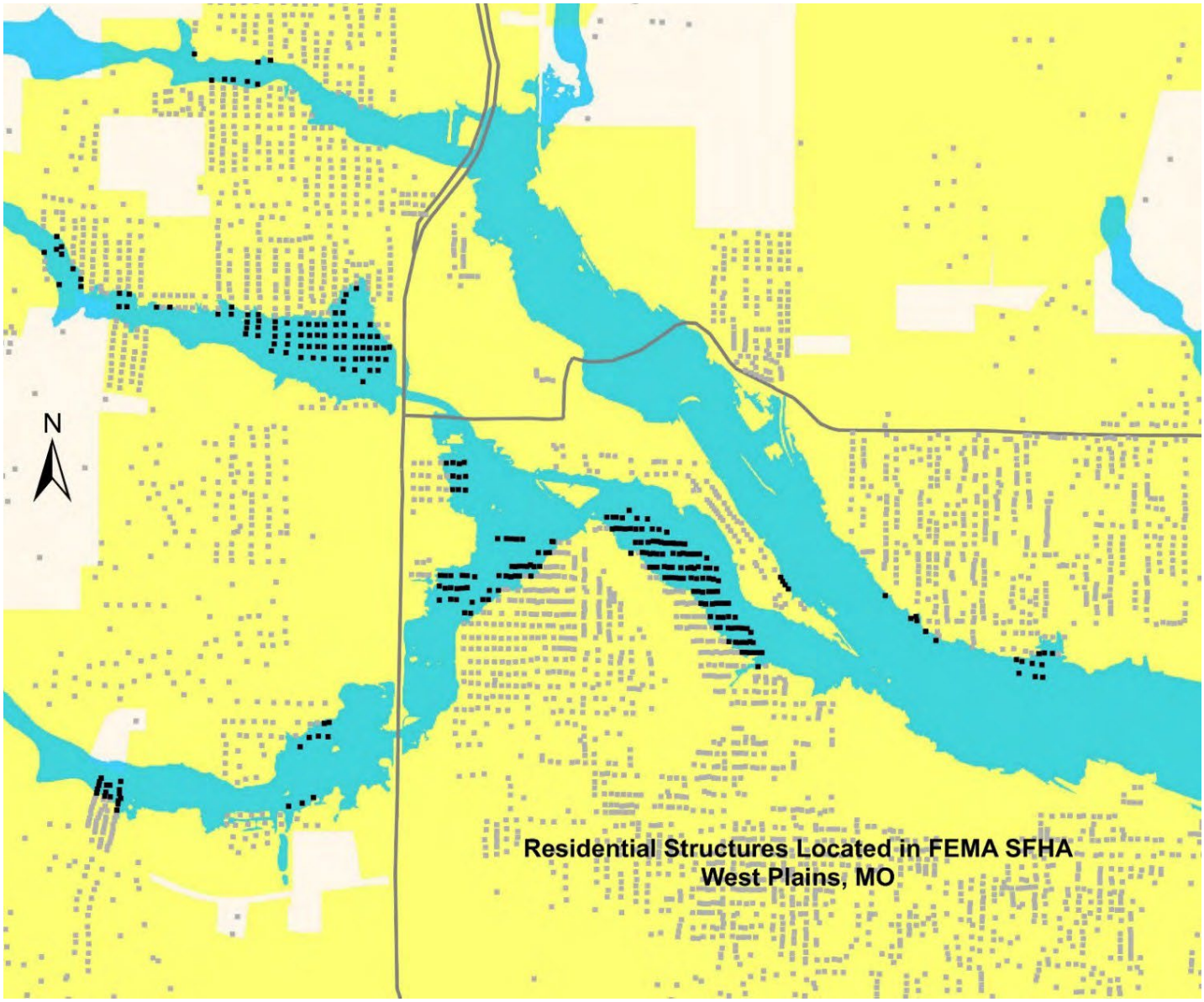
Jurisdiction	Residential	Commercial	Agricultural	Total Building Count
Howell County	46	0	65	111
City of Brandsville	1	0	0	1
City of Mountain View	27	12	0	39
City of West Plains	301	145	5	451
City of Willow Springs	33	25	2	8

Table 3.23 provides the total exposure for structures and contents by building type and jurisdiction. Losses were estimated by applying a 5% damage factor to total exposure. A 5% damage factor was used under the assumption that not all at-risk structures in the county would be affected simultaneously during a flooding event, nor would the individual structures sustain catastrophic damage.

Table 3.23. Total Flood Exposure and Estimated Losses by Jurisdiction (in dollars)

Jurisdiction	Residential	Commercial	Agricultural	Estimated Exposure	Estimated Loss
Howell County	629,684	0	51,955	681,639	34,081.95
City of Brandsville	7,363	0	0	7,363	368.15
City of Mountain View	225,542	22861.69	0	248,404	12,420.20
City of West Plains	5,753,399	2970203.9	163,614	8,887,218	444,360.88
City of Willow Springs	433,249	732204.05	18,044	1,183,497	59,174.86

Figure 3.8. Residential Structures Located Within the SFHA – West Plains



Impact of Future Development

Future development could impact flash flooding and riverine flooding in the planning area. Development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage during heavy rainfall events will be at risk to flash flooding. Future development would also increase impervious surfaces causing additional water run-off and drainage problems during heavy rainfall events. Not all jurisdictions in the county participate in the NFIP. Not all jurisdictions in the county have identified SFHAs. Zoning regulations that prohibit development in SFHAs and violations of floodplain management regulations are effective mitigation strategies in participating municipalities.

Hazard Summary by Jurisdiction

All local governments in the county are not equally at risk to flood hazards. Table 3.23 above details the exposure of assets near SFHAs and how it varies by jurisdiction. Many parts of the county are vulnerable to street and road flooding during periods of heavy rainfall. In particular, Highway 142 southern Howell County is particularly vulnerable to closure during flooding events. The greatest impact of flooding is felt in the City of West Plains and in unincorporated part of the county. Due to the topography and many streams in the county, numerous low water crossings are damaged and create a significant hazard to public safety during flood events. This heightens the risk and exposure to infrastructure maintained by the Howell County Commission. There is no heightened risk to school district facilities due to flood as no facilities are located inside FEMA SFHAs. No previous damage to school facilities by flooding was reported on the Data Collection Questionnaires used in the planning process.

Problem Statement

Floods are frequent events and have been listed in 9 out of 13 presidential disaster declarations that have included Howell County. Historic flooding that occurred within a month of the development of this plan produced approximately $250,000 in damages throughout the county – a figure that many believe to be largely under-reported. Numerous water rescues have occurred in the county since 2002. Significant debris accumulation and damages at low water crossings have become regular occurrences due to flash flooding events.

The County Commission is in the process of developing a low water crossing inventory and improvement priority list for inclusion in their ongoing maintenance and management efforts. It is desired that warning signs, gauges, and perhaps warning lights be installed at frequently flooded low water crossings. The county is focusing on the replacements of frequently damaged crossings. Hazard awareness programs and education, such as “turn around, don’t drown” messages during and prior to flood events in the county broadcast by local media can mitigate future risks to motorists at low water crossings.

3.4.2 Dam Failure

Hazard Profile

Hazard Description

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following:

- Overtopping - inadequate spillway design, debris blockage of spillways or settlement of the dam crest.
- Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.
- Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.
- Structural Failure: caused by an earthquake, slope instability or faulty construction.

According to the State Plan, Missouri had some 5,423 recorded dams in 2018, the largest number of man-made dams of any state in the country. Missouri topography allows lakes to be built easily and inexpensively, which accounts for the high number of dams. Despite the large number of dams, there are only 682 (about 13 percent) state regulated dams, with an additional 66 federally regulated dams. Federal dams in Missouri are primarily regulated by two federal agencies; the US Army Corps of Engineers (USACE) and the US Department of Agriculture Forest Service. The remaining 4,495 dams are unregulated.

Dams that fall under state regulation are non-federally regulated dams that are more than 35 feet in height. Most nonfederal dams are privately owned structures built either for agricultural, water supply or recreational use. The Department of Natural Resources (MDNR) Water Resources Center maintains the Dam and Reservoir Safety Program in Missouri. The program ensures that dams over 35 feet in height are safely constructed, operated, and maintained pursuant to Chapter 236 of the Revised Statutes of Missouri.

The Department of Natural Resources provided information about regulated and unregulated dams in Missouri. The information includes details of the dam dimensions, date of construction, approximate reservoir volume, contributing drainage basin area and hazard classification. In addition, USACE maintains the National Inventory of Dams (NID). The information in the NID database matches the list from the MDNR website with some additional details for dams in Howell County. Although both agencies proved a hazard classification for dams, the dam classification systems differ.

The Missouri Dam and Reservoir Safety Council Rules and Regulations uses three classes of downstream environmental zones used when considering permits. The downstream environment zone is the area below the dam that would become inundated should the dam fail. Inundation is defined as water two feet or more over the submerged ground outside of the stream channel. These classes are based on the number of structures and types of development contained within the inundation area as presented in the following table. The downstream environment zone classification is also used to prescribe the frequency of inspection.

Table 3.24. MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspections of these dams must occur every two years.
Class II	The area downstream from the dam that would be affected by inundation contains one to nine permanent dwellings, or one (1) or more campgrounds with permanent water, sewer and electrical services or one (1) or more industrial buildings. Inspections of these dams must occur once every three years.
Class III	The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspections of these dams must occur once every five years.

Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules_reg_94.pdf

Dams in the NID are classified according to hazard potential, an indicator of the consequences of dam failure. A dam's hazard potential classification, presented in the following table above does not indicate its condition. Dams assigned the high hazards potential classification are those where failure will potentially result in loss of human life. Significant hazard potential are those dams where failure results in no probable loss of human life but can cause economic loss. Dams assigned the low hazard potential classification are those where failure will result in no probable loss of human life and low economic or environmental losses. Losses are principally limited to the owner's property.

Table 3.25. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	Failure results in only minimal property damage
Significant Hazard	Failure could possibly result in the loss of life and appreciable property damage
High Hazard	If the dam were to fail, lives would likely be lost and extensive property damage would result

Source: National Inventory of Dams

There is not a direct correlation between the State Hazard classification and the NID classifications. However, most dams that are in the States Classes I and II are considered NID High Hazard Dams.

Geographic Location

According to the MDNR there are 25 total dams in Howell County and zero regulated dams. MDNR lists two dams as hazard class 1: Grisham Lake Dam and Willow Springs Hunting Club Dam, and one dam as hazard class 2: McCormack Lake Dam.

NID data also indicated that there are 25 total dams in the county, 15 listed as low hazard potential, two (2) listed as significant hazard potential, and eight listed as high hazard potential.

Dams in Planning Area

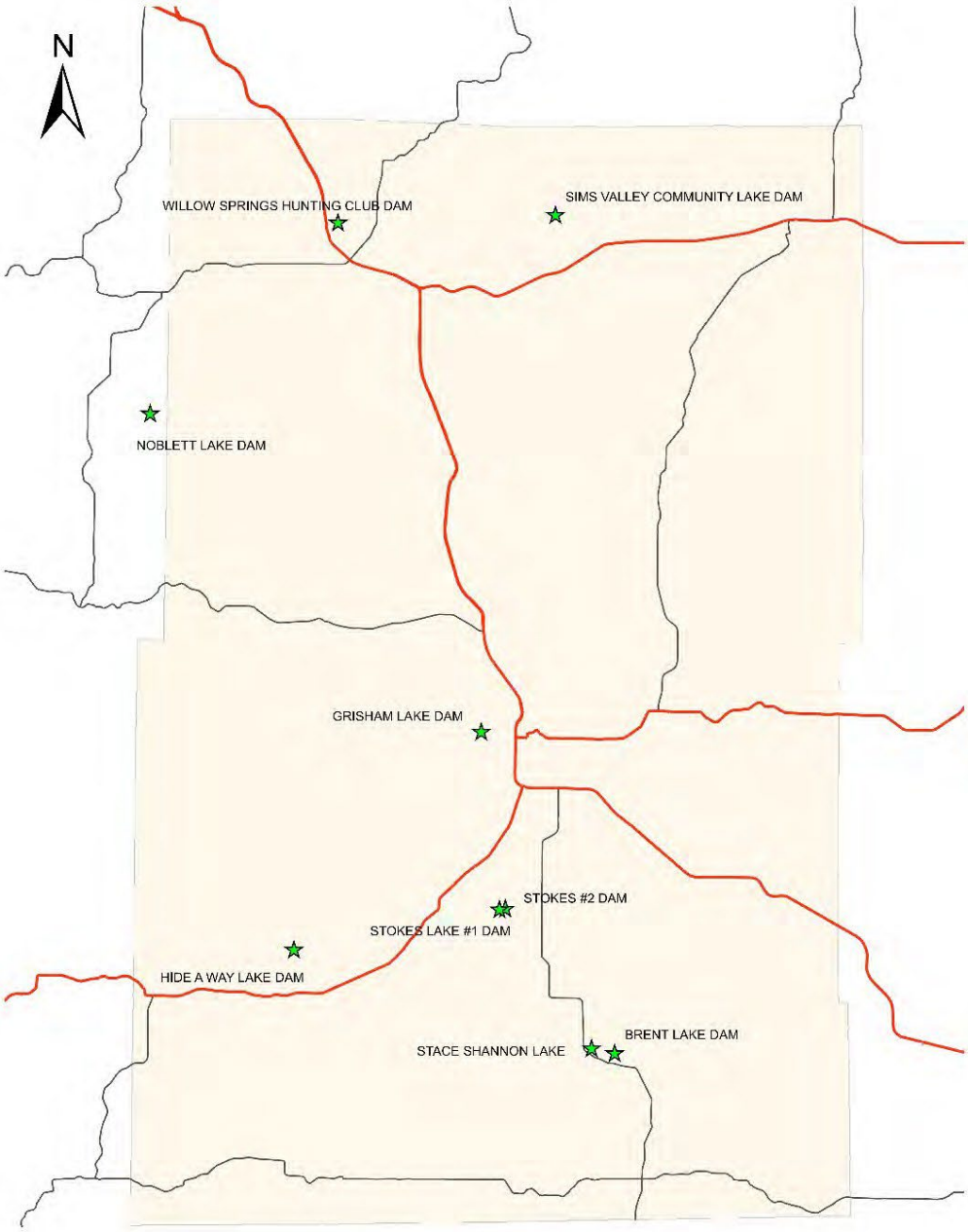
Table 3.26 lists the names, locations, and other pertinent information for all high hazard dams in the planning area.

Table 3.26. High Hazard Dams in the Howell County Planning Area

Dam Name	Emergency Action Plan (EAP)AP	Dam Height (Ft)	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Dam Owner
GRISHAM LAKE DAM	NA	25	201	6/19/1980	TR-HOWELL CR	West Plains	0	G.E. GRISHAM
BRENT LAKE DAM	NA	30	369	NA	TR-SOUTH FORK SPRING RIVER	Lanton	5	L.C. TOOLEY
HIDE A WAY LAKE DAM	NA	20	235	NA	WILSON CR	Caulfield	4	WAYLAND GUNTER
STACE SHANNON LAKE	NA	32	531	NA	TR-SOUTH FORK SPRING RIVER	Lanton	5	L.C. TOOLEY
STOKES LAKE #1 DAM	NA	33	1059	NA	SPRING CR	South Fork	3	E.T. STOKES
STOKES #2 DAM	NA	33	1059	NA	TR-SPRING CR	South Fork	3	E.T. STOKES
WILLOW SPRINGS HUNTING CLUB DAM	NA	20	214	1/21/1981	TR-ELEVEN POINT RIVER	Willow Springs	0	WILLOW SPRINGS OUTING CLUB
SIMS VALLEY COMMUNITY LAKE DAM	NA	33	724	NA	TR-LOST CAMP CR	Mountain View	6	MO DEPT. CONSERVATION

Sources: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12By the end of 2015, the Missouri DNR anticipates having Emergency Action Plans, including inundation maps for all state-regulated Class 1 and Class 2 dams. Contact the DNR Dam and Reservoir Safety Program at 800-361-4827 to request the inundation maps for your county to show geographic locations at risk, extent of failure and to perform GIS analysis of those assets at risk to dam failure

Figure 3.9. High Hazard Dam Locations in Howell County



Source: U.S. Army Corps of Engineers, Missouri Department of Natural Resources

Upstream Dams Outside the Planning Area

The Noblett Lake Dam is located in Douglas County, as seen in Figure 3.9., a short distance from the western boundary of Howell County. However, the dam's inundation area is located to the southwest, away from the jurisdiction of Howell County.

Severity/Magnitude/Extent

The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

Actual dam failure can result not only in loss of life, but also considerable loss of capital investment, loss of income, and property damage. Loss of the reservoir itself can cause hardship for those dependent on it for their livelihood or water supply.

Previous Occurrences

There are no records of dam failure in Howell County. Since there are zero recorded events in the planning area, a calculation of a probability percent is not possible. According to information from the 2018 State Plan, Missouri's percentage of high hazard dams in the MDNR inventory puts the State at about the national average for that category. However, if development occurs downstream of dams the percentage of high hazard dams will increase. Additionally, the probability of dam failure increases as many of the smaller and privately owned dams continue to deteriorate without the benefit of further regulation or improvements. Regular inspection and maintenance schedules for dams greatly reduces the probability of dam failure. The last inspection of a high hazard dam in Howell County was 35 years ago.

Probability of Future Occurrence

There is no record of dam failure within the county. For the 26-year period from 1975 to 2001 for which dam failure statistics are available, 17 dam failures were recorded. This does not include the devastating Taum Sauk failure in 2005 or the Moon Valley Lake Dam failure in 2008 since the comprehensive data collected by Stanford University was not updated past 2001. According to this data, the annual probability calculated to and 65% (17/26 = 0.65 or 65%) probability in any given year for at least one dam failure event in the State of Missouri. However, with over 5,000 dams in the State, this translates to an overall low probability per dam structure.

Changing Future Conditions Considerations

According to the 2018 State Hazard Mitigation Plan, dam failure is tied to flooding and the increased pressure that flooding has on dams. Future condition projections imply an increase in precipitation and more extreme events, which may increase flood risk and put additional stress on dams.

Vulnerability

Vulnerability to dam failure in Howell County is limited to structures and critical infrastructure located in dam inundation zones. Two dams are located in incorporated jurisdictions. Willow Springs Hunting Club Lake Dam is in Northwest Willow Springs and Grisham Lake Dam is located west of West Plains. The remaining six high hazard dams are located in the unincorporated areas of the county. There are no regulated dams in the county, and no existing inundation zone maps for any dams in Howell County. Also, there are no EAPs for dams in the county. The following figures 3.3 to 3.8 depict the expected flow direction of water in the event of dam failure.

Figure 3.10. Grisham Lake Dam

Figure 3.11. Willow Springs Hunting Club Dam

Figure 3.12. Hideaway Lake Dam

Figure 3.13. Sims Valley Community Lake Dam

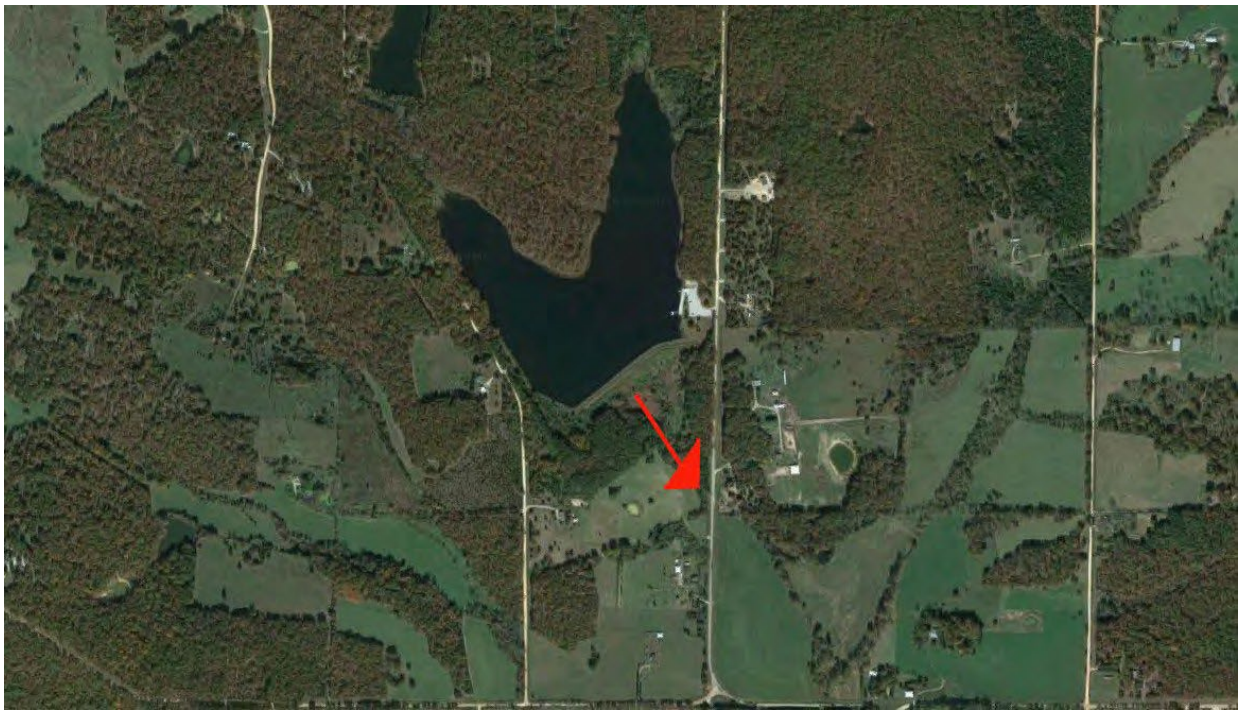


Figure 3.14. Stace Shannon (left) and Brent Lake (right) Dams

Figure 3.15. Stokes Lake Dams #1 (left) and #2 (right)

Potential Losses to Existing Development

Fortunately, the eight high hazard dams located in Howell County are located in areas where there is no significant development in downstream areas. In the absence of MDNR inundation zone maps and Emergency Action Plans, it is difficult to determine the exact areas where inundation would occur, but in reviewing recent aerial photography, it can be stated that the risk to human life, and the risk for property damage in the event of a failure of one of the eight high hazard dams in Howell County would be minimal.

Impact of Future Development

The planning area, specifically, the areas downstream of Howell County's high hazard dams are rural in nature. However, growth in the county is moderately strong and any future development in potential inundation areas will increase vulnerability to dam failure hazards. However, due to the amount and affordability of developable land, it is unlikely that residential structures will be developed in a location that is inside an inundation zone.

Hazard Summary by Jurisdiction

Unincorporated Howell County is the one of three jurisdictions in the Plan that is vulnerable to dam failure. The other two jurisdictions containing high hazard dams are Willow Springs and West Plains. There are no mapped inundation areas or potential inundation areas within cities. No school district facilities are located within potential inundation areas or downstream environments from existing dams.

Problem Statement

There are eight dams in the county with high hazard potential. However, none of the dams have mapped inundation zones or EAPs therefor it is difficult to gauge the vulnerability of downstream environments. The development of inundation zone maps by MDNR would help the citizenry of Howell County become more familiar with the risk they face due to the potential for dam failure. Additionally, the inspection rate of the high hazard dams in Howell County seems to be lacking. Of the eight high hazard dams, the last inspection took place in 1981. The MPC feels it would be beneficial if these dams were inspected more regularly.

3.4.3 Earthquakes

Hazard Profile

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one side of the fault slips, generating compressive and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

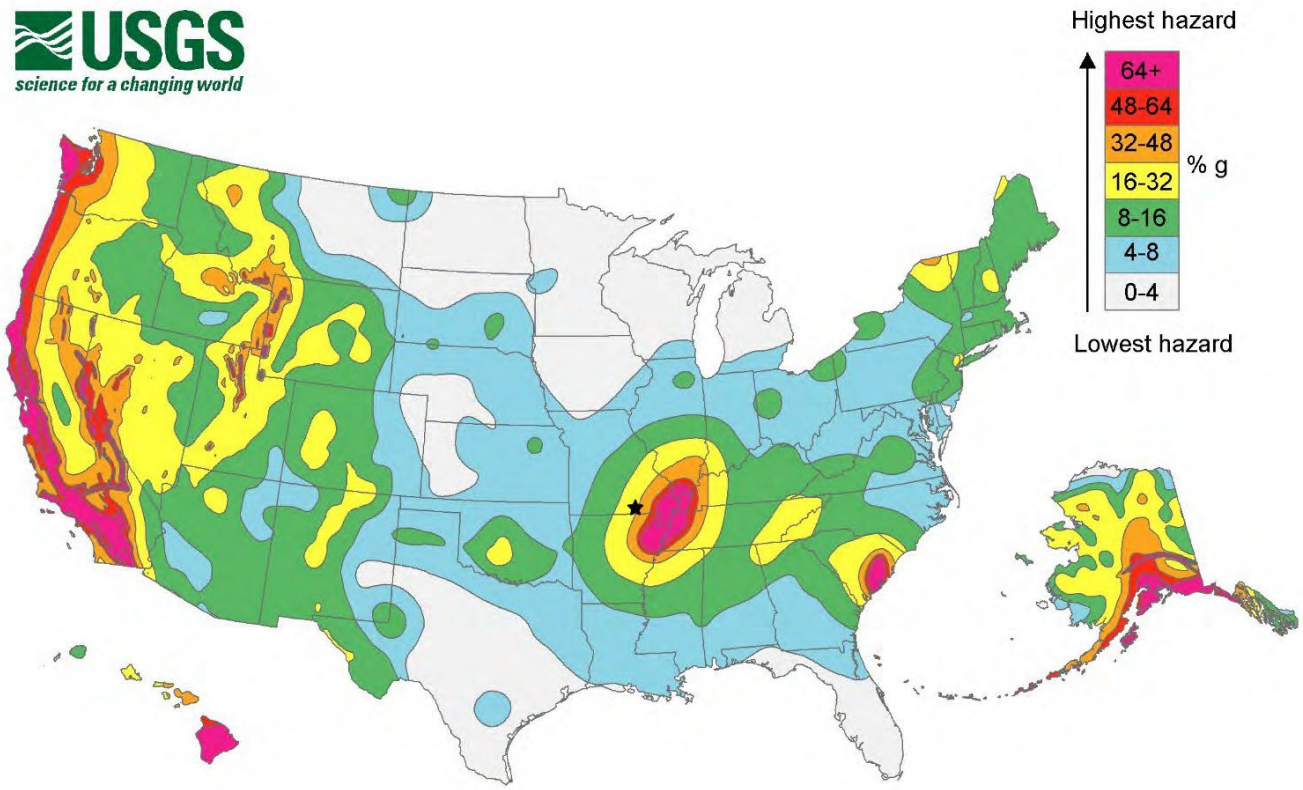
The subterranean faults were formed many millions of years ago on or near the surface of the earth. Subsequent to that time, these ancient faults subsided, while the areas adjacent were pushed up. As this fault zone (also known as a rift) lowered, sediments filled in the lower areas. Under pressure, the sediments hardened into limestones, sandstones, and shales – thus burying the rifts. The pressures on the North American plan and the movements along the San Andreas Fault by the Pacific plate have reactivated the buried rift(s) in the Mississippi embayment. This rift system is called the Reelfoot Rift and underlies the New Madrid Seismic Zone. (Braile et al., 1986)

Geographic Location

The greatest hazard from earthquakes in Howell County comes from the New Madrid Seismic Zone situated in the boot heel area of southeast Missouri. The potential of high magnitude earthquakes occurring along the New Madrid fault presents risk that does not vary across the planning area. The Nemaha uplift is central Kansas is also prone to seismic activity, however the center of the Humbolt fault zone near the Nemeha Uplift is approximately 300-350 miles west/northwest of Howell County and lower magnitude seismic events that will not impact jurisdictions in Howell County.

The 2014 USGS National Seismic Hazard Maps display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments and other public policy. The updated maps represent an assessment of the best available science in earthquake hazards and incorporate new findings on earthquake ground shaking, faults, seismicity, and geodesy. The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquakes and associated ground shaking obtained from interaction in science and engineering workshops involving hundreds of participants, review by several science organizations and State surveys, and advice from expert panels and a Steering Committee. Figure 3.16. is a USGS map illustrating seismicity in the United States. A star showing the general location of Howell County has been inserted on the map.

Figure 3.16. Seismicity in the United States



Source: United States Geological Survey at http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014_lg.jpg

Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined a follow.

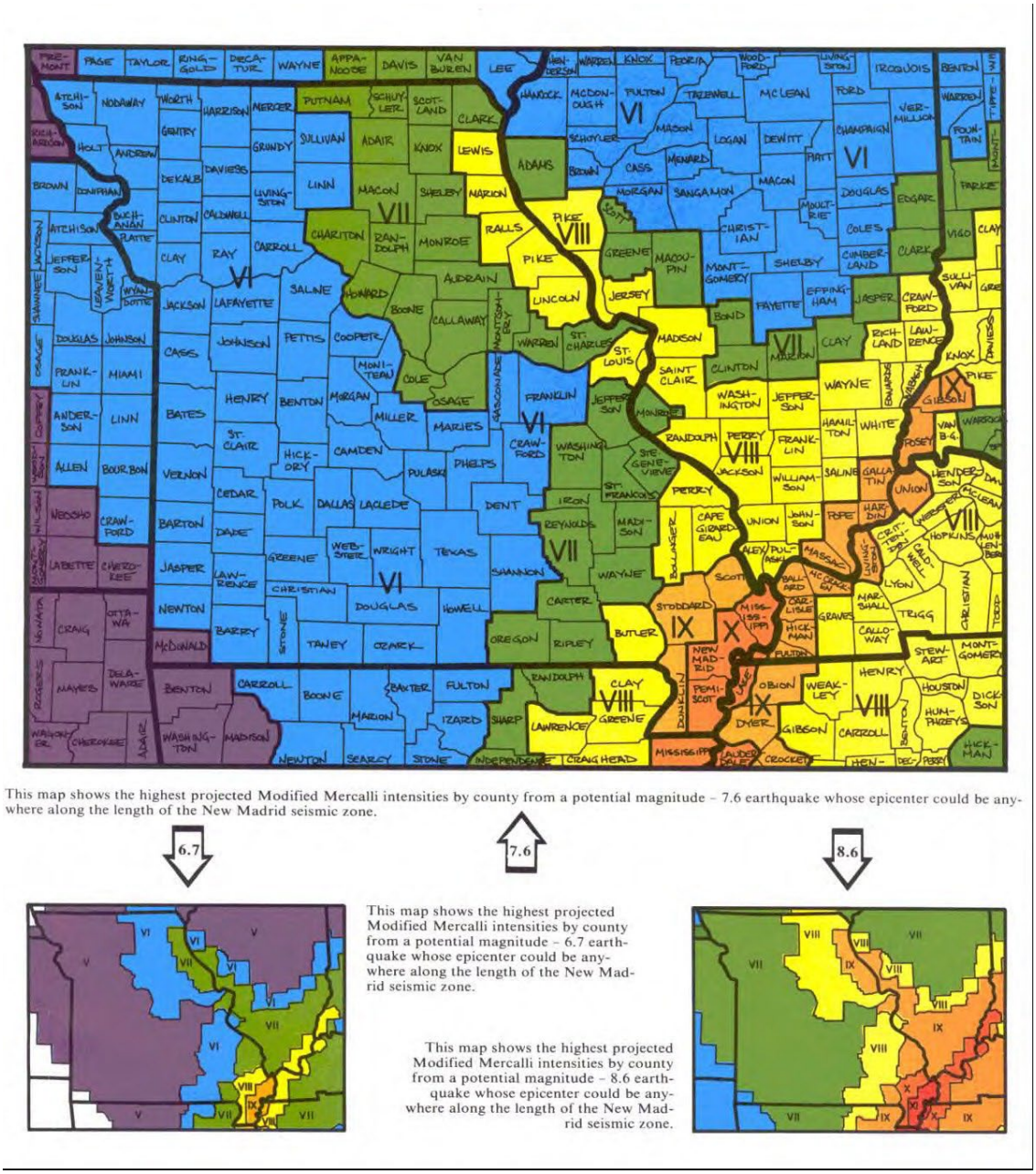
Richter Magnitude Scale

The Richter Magnitude Scale was developed in 1935 as a device to compare the size of earthquakes. The magnitude of an earthquake is measured using a logarithm of the maximum extent of waves recorded by seismographs. Adjustments are made to reflect the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, comparing a 5.3 and a 6.3 earthquake shows that the 6.3 quake is ten times bigger in magnitude. Each whole number increase in magnitude represents a tenfold increase in measured amplitude because of the logarithm. Each whole number step in the magnitude scale represents a release of approximately 31 times more energy.

Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 and is composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale does not have a mathematical basis but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

Figure 3.17. Impact Zones for Earthquake Along the New Madrid Fault



Source: http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%208&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/2012-State-Hazard-Analysis/Annex_F_Earthquakes.pdf

Figure 3.17 (above) shows the highest projected Modified Mercalli Intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in the figure above show the same regional intensities for 6.7 and 8.6 earthquake, respectively. Howell County is located in zone VII from a potential magnitude 7.6 earthquake along the New Madrid fault.

Table 3.27. Modified Mercalli Intensity Scale

Intensity Level	Description
I	People do not feel any movement.
II	A few people might notice movement.
III	Many people indoors feel movement; Hanging objects swing.
IV	Most people indoors feel movement; Dishes, windows, and doors rattle; Walls, frames and structures creak; Liquids in open vessels are slightly disturbed; Parked cars rocked.
V	Almost everyone feels movement. Most people are awakened; Doors swing open or closed; Dishes are broken: Pictures on the wall move: Windows crack in some cases; Small objects move or are turned over: Liquids might spill out of open containers.
VI	Almost everyone feels movement. Most people are awakened; Considerable quantities of dishes, glassware, and windows are broken; People have trouble walking; Pictures fall off walls; Objects fall from shelves; Plaster in walls might crake; Some furniture is overturned; Small bells in churches, chapels, and schools ring.
VII	People have difficulty standing; Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, and spires; Damage is slight to moderate in well-built buildings; Numerous windows are broken; Weak chimneys break at rooflines; Cornices from towers and high buildings fall; Loose bricks fall from buildings; Heavy furniture is overturned and damaged; Some sand and gravel stream banks cave in.
VIII	Drivers have trouble steering; Poorly built structures suffer severe damage; Ordinary substantial buildings partially collapse; Damage slight in structures especially built to withstand earthquakes; Tree branches break; Houses not bolted down may shift on foundations; Tall structures such as towers and might chimneys twist and fall; Temporary or permanent changes in springs and wells; Sand and mud isejected.
IX	Most buildings suffer damage; Houses not bolted down move off their foundations; Some underground pipes are broken; The ground cracks conspicuously; Reservoirs suffer damage.
X	Well-built wooden structures destroyed; most masonry and frame structures destroyed, including foundations; Rails bent; Dams seriously damaged; Cracks open in pavement.
XI	Few, if any masonry structures remain standing; Large well-built bridges destroyed; Rails

Previous Occurrences

There is no record of recent earthquake occurrence within Howell County (2000-2020). The southeastern portion of Missouri is most susceptible to earthquakes because it overlies the New Madrid Seismic Zone. No area of Missouri is immune from the danger of earthquakes. Minor, but potentially damaging earthquakes can occur anywhere in the state. (SEMA, 2018)

Probability of Future Occurrence

Without a historical record for earthquakes in Howell County it is not possible to calculate a precise probability of earthquake occurrence. The Center for Earthquake Research and Information (CERI) at the University of Memphis has computed conditional probabilities of a magnitude 6.0 earthquake in the New Madrid Seismic Zone. According to a fact sheet prepared by SEMA in 2003, the probability for a magnitude 6.0 to 7.5 earthquake along the New Madrid Fault is 25 to 40 percent chance of occurrence over the next 50 years. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0%. At the 40% level, the likelihood of an earthquake happening in a given year is 1.6%. The previous map (Figure 3.10) indicates the potential severity for Howell County of a 6.7, 7.6, and 8.6 magnitude earthquake anywhere along the New Madrid Fault.

Changing Future Conditions Considerations

Scientists are beginning to believe there may be a connection between changing climate conditions and earthquakes. Changing ice caps and sea-level redistribute weight over fault lines, which could potentially have an influence on earthquake occurrences. However, currently no studies quantify the relationship to a high level of detail, so recent earthquakes should not be linked with climate change. While not conclusive, early research suggests that more intense earthquakes and tsunamis may eventually be added to the adverse consequences that are caused by changing future conditions.

Hazard Summary by Jurisdiction

Earthquake intensity is not likely to vary greatly throughout the planning area, the risk of occurrence is the same throughout. However, damages will differ where there are variations in the planning area based on percentage of structures build prior to 1939. For example, if one community has a high percentage of residences built prior to 1939 than the other participants, that community is likely to experience higher damages. Table 3.28 lists the number and percentage of housing units built in 1939 or earlier.

Table 3.28. Percent of Housing Units Built in 1939 or Earlier

Jurisdiction	Built in 1939 or earlier #	Built 1939 or earlier %
Howell County	1,724	10%
City of Brandsville	8	11%
City of Mountain View	167	14.4%
City of West Plains	639	11%
City of Willow Springs	182	19%

Source: Missouri Census Data Center (2020) ACS Profiles

School districts with facilities constructed prior to 1939 could suffer more damages than newer facilities, however, the majority of the currently utilized school facilities in the district have been constructed after 1939 and are considered well-built structures and therefore, less vulnerable to potential ground shaking.

Impact of Future Development

Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an earthquake event.

Vulnerability

Vulnerability Overview

Ground shaking is the most damaging effect from earthquakes. Ground shaking will impact all structures and critical infrastructure such as roads and electrical transmission systems. Although Nearby Ripley County experienced a 3.3 magnitude earthquake there were no document damages associated with this low magnitude event. The greatest earthquake risk to Howell County is the New Madrid Fault in the bootheel region of Missouri. A 7.6 magnitude earthquake would result in people have difficulty standing; Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, and spires; Damage is slight to moderate in well-built buildings; Numerous windows are broken; Weak chimneys break at rooflines; Cornices from towers and high buildings fall; Loose bricks fall from buildings; Heavy furniture is overturned and damaged; Some sand and gravel stream banks cave in. In addition, some underground utilities would likely be damaged. Some injuries may occur, but fatalities are unlikely.

Potential Losses to Existing Development

In Howell County, 7.6 magnitude earthquake along the New Madrid Fault could be expected to result in everyone feeling ground shaking; poorly built buildings are damaged slightly; considerable quantities of dishes, glassware and windows are broken; people have trouble walking; pictures fall off walls; objects fall from shelves; plaster in walls might crack; some furniture is overturned; and small bells in churches, chapels, and schools will ring. In addition, some underground utilities would likely be damaged. Injuries may occur but are unlikely

A smaller yet still significant 6.7 quake along the fault line in would likely result in almost everyone feeling movement. Most people will be awakened if sleeping; doors swing open or closed; dishes are broken; pictures on the wall move; windows crack in some cases; small objects move or are turned over; liquids might spill out of open containers.

Problem Statement

Based on likely damage from a 7.6 magnitude earthquake along the New Madrid fault, the downtowns, and historic districts of communities in Howell County are at risk to significant damage. These older structures could perhaps be retrofitted with earthquake resistance measures to ensure their stability in the event of an earthquake of severe magnitude. Potential damages to future development can be mitigated by adopting and enforcing IBC 2012 building codes. Currently, only the City of West Plains enforces such codes. Updating and enforcing building codes in other jurisdictions would mitigate the impact on future development from an earthquake event.

3.4.4 Land Subsidence/Sinkholes

Hazard Profile

Hazard Description

Sinkholes are depressed or collapsed areas formed by dissolution of carbonate bedrock or collapse of underlying caves. They range in size from several square yards to hundreds of acres and may be very shallow or hundreds of feet deep. Sinkholes are part of what is called karst topography, which also includes caves, springs and losing streams. Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that naturally can be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. The sudden collapse of the land surface above them can be dramatic and range in size from broad, regional lowering of the land surface to localized collapse. Land subsidence may also result from human activities such as, underground mining, groundwater or petroleum withdrawal, and drainage of organic soils.

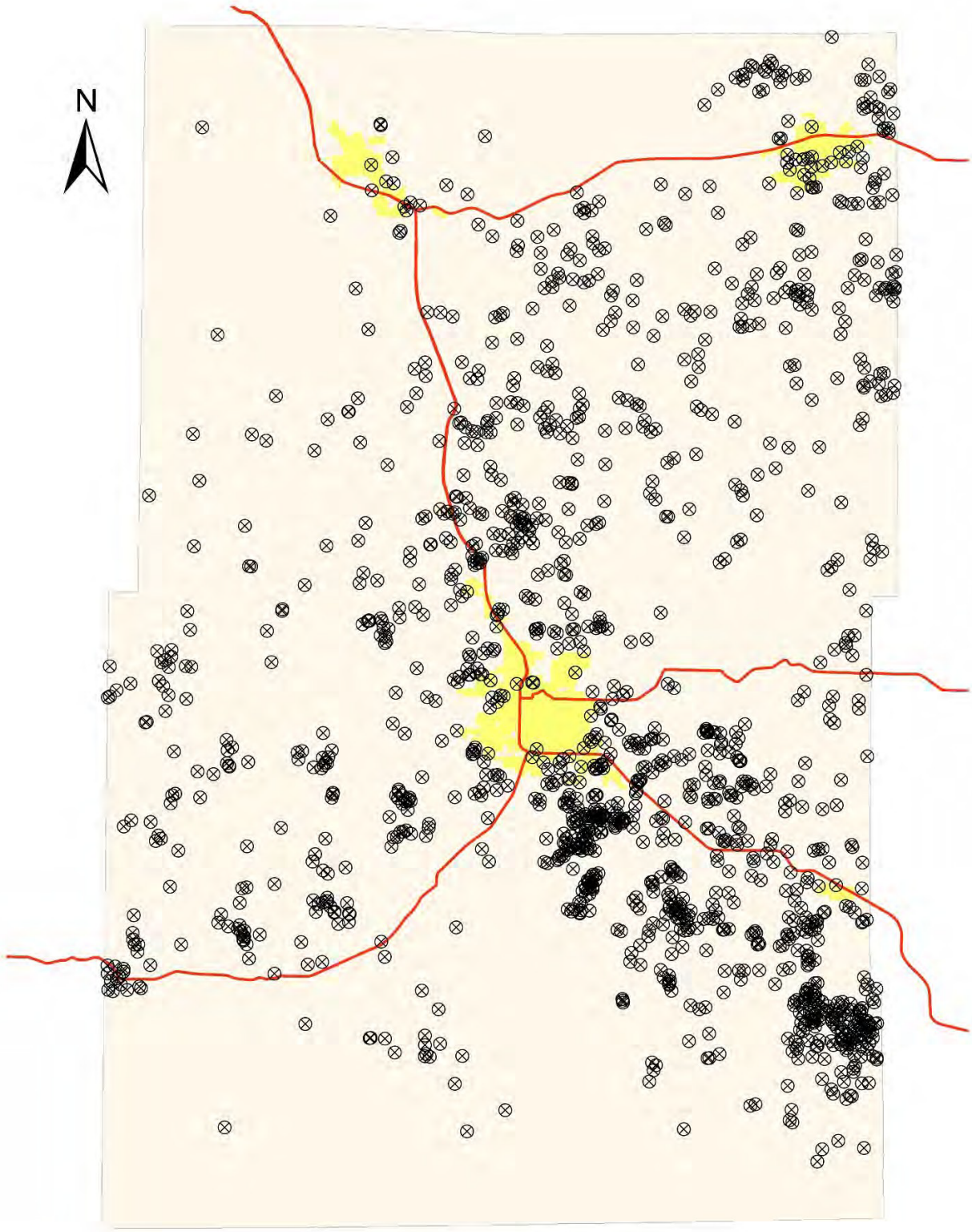
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings into bedrock caves eroding and collapsing into the cave opening. These collapses are called “cover collapses” and geologic information can be applied to predict the general regions where collapse will occur. Land subsidence occurs slowly and continuously over time, as a general rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkhole formation can be aggravated by a change in stormwater runoff patterns resulting from an increase in impervious surfaces from land development.

According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur in Missouri on a fairly frequent basis. Most of Missouri‘s sinkholes occur naturally in the State‘s karst regions (areas with soluble bedrock). They are a common geologic hazard in southern Missouri, but also occur in the central and northeastern parts of the State. Missouri sinkholes have varied from a few feet to hundreds of acres and from less than one to more than 100 feet deep. Sinkholes can also vary is shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

Geographic Location

According to spatial data from Missouri Geological Survey, there are 1,376 sinkhole formations have been identified in Howell County. Figure 3.18 below, provides the location of known sinkholes in the county. Although the risk of sinkhole formation exists countywide, the map shows that the unincorporated areas of the county and in particular the locales to the south and southwest of the City of West Plains have an elevated risk to sinkhole formation than other communities in the county.

Figure 3.18. Known Sinkholes in Howell County



Severity/Magnitude/Extent

Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

Previous Occurrences

The 2018 State Plan includes only seven documented sinkhole notable events statewide where property damage has occurred. The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development, nor have they caused serious damage. Thus, the severity of future events is likely to be low.

Probability of Future Occurrence

Based on local information and the 2011 Missouri State Hazard Mitigation Plan, there have been zero documented sinkhole formations or expansions in the county during an eleven-year period from 2006-2015. This equates to a 0% probability of a sinkhole formation in any given year in the county. However, in considering the large number of known sinkholes in Howell County, it is likely that unreported sinkhole formation occurs every year.

Changing Future Conditions Considerations

Changes in climate conditions could increase the number of sinkhole occurrences throughout Howell County. Drought periods can reduce groundwater levels, making the sediments within a sinkhole-prone hazard area dry and unstable. Severe storms triggered by drought could bring torrential rainfall that washes out the supporting sediments, undercutting the ground and creating conditions conducive to sinkhole formation.

Vulnerability

Vulnerability Overview

Sinkholes in Missouri are a common feature where limestone and dolomite outcrop. Dolomite is a rock similar to limestone with magnesium as an additional element with the calcium normally present in the minerals that form the rocks. While some sinkholes may be considered a slow changing nuisance; other more sudden catastrophic collapses can destroy property, delay construction projects, contaminated groundwater resources, and damage underground utilities. The entire county is underlain with limestone and dolomite bedrock.

Potential Losses to Existing Development

A 75-foot buffer zone was created in GIS then overlaid on the Howell County Structures layer to identify structures located in close proximity to known sinkholes. The results of this operation show that in Howell County there are nine (9) structures located within 75 feet of a known sinkhole.

Impact of Future Development

Future development in areas of known risk to sinkhole formation in the planning area will increase vulnerability to this hazard. Population and development in these areas, specifically in the West Plains area and southern Howell County will increase exposure to sinkhole occurrence. While no building codes currently restrict construction within a certain distance of known sinkholes, in is encouraged that local officials explore options to implement this regulatory condition.

Hazard Summary by Jurisdiction

The risk of sinkhole damage for individual communities and school districts is limited to the amount of exposure of buildings and infrastructure. The entire county is at risk for potential sinkhole development, however, the Cities of West Plains and Brandsville are located in areas with high density of known sinkholes. This indicates that the subsurface conditions are currently favorable for the development of sinkhole features. It is unlikely that school districts will be greatly affected by sinkholes due to the localized nature of their exposure.

Problem Statement

It is likely that more sinkholes will occur as development occurs within the county. Sinkholes can be remediated with fill material. Once a sinkhole has been remediated, building should be prohibited at the site. Existing sinkholes can expand if surface runoff erodes the edges of the sinkhole. Best efforts to divert stormwater runoff from known sinkholes should be made. Howell County has a high density of sinkholes and the effects of collapse sinkholes on the built environment should be noted as a public service to the county's residents.

3.4.5 Drought

Hazard Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the 2018 State Plan, which are as follows.

Meteorological drought is defined in terms of the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.

Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

Socioeconomic drought refers to when physical water shortage begins to affect people.

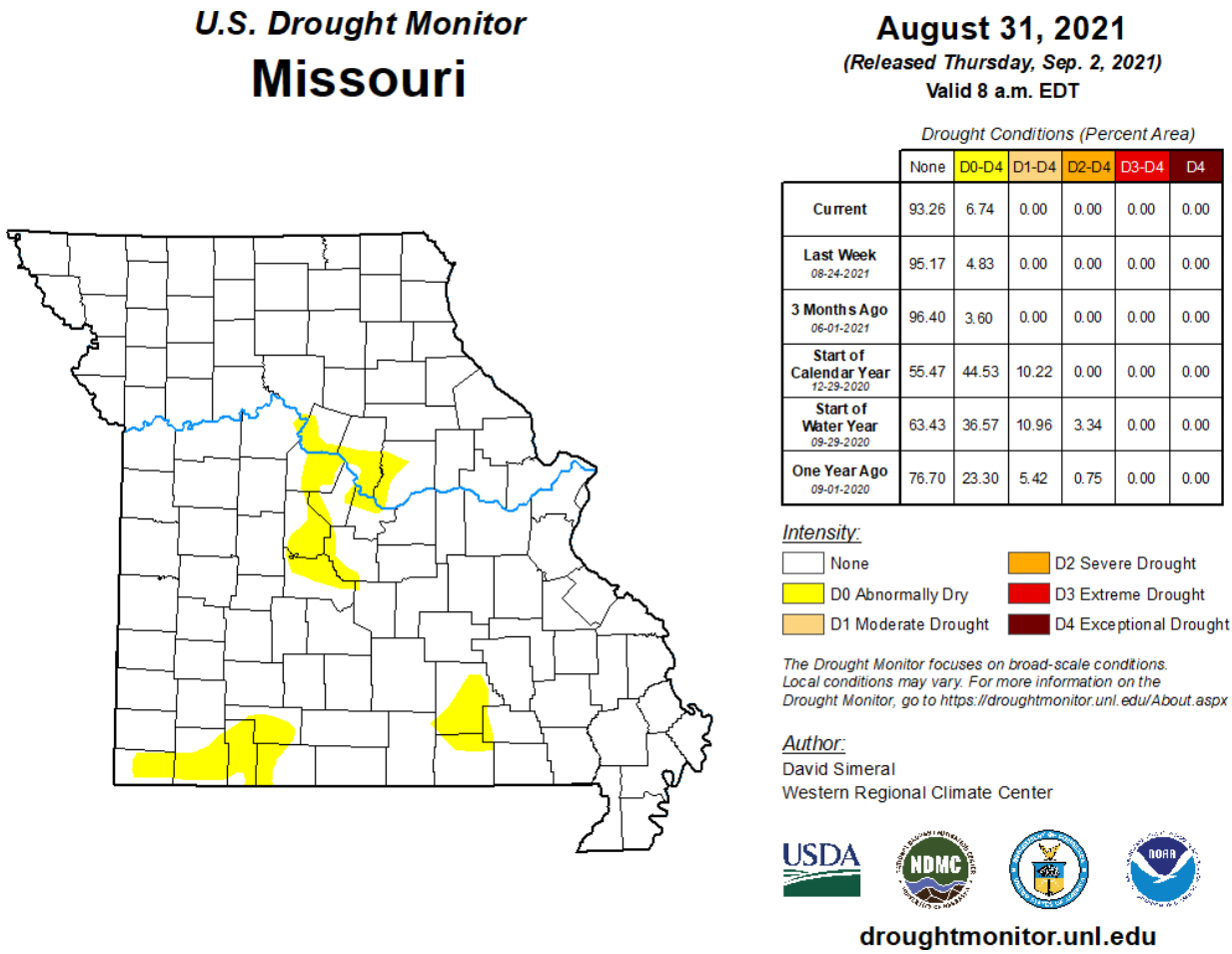
Geographic Location

Droughts are regional climatic events that can impact large areas and multiple counties. The entire county is as risk to the impacts of drought. However, drought most directly impacts the agricultural sector, so areas within the county where there is extensive agricultural land use can experience significant impacts. As noted previously in the plan, Howell County is home to intensive livestock production. All incorporated communities in the county rely on wells for water supply. The impact of drought on deeper public wells would not be significant unless the drought was of such historic severity to reduce groundwater levels.

Severity/Magnitude/Extent

Figure 3.19. below is a recent map from the US Drought Monitor and an example of the size of the geographic area that could be in drought conditions at any given moment in time. The map is only a snapshot of conditions at a given time and indicates the severity of drought conditions.

Figure 3.19. U.S. Drought Monitor Map of Missouri on 8-31-2021



Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MO

The most commonly used indicator of drought severity is the Palmer Drought Severity Index (PDSI), jointly published by the NOAA and the United States Department of Agriculture. The Palmer Drought Indices measure dryness based on recent precipitation and temperature. The indices are based on a "supply-and-demand model" of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates, and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a "0" as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers.

According to the MDNR Missouri Drought Plan revised in 2002, Missouri Drought Response System is divided into four phases based on Palmer Index values:

- **Phase I: Advisory Phase**—Requires a drought monitoring and assessment system to provide enough lead time for state and local planners to take appropriate action;
- **Phase II: Drought Alert**—When the PDSI reads -1.0 to -2.0, and stream flows, reservoir levels, and groundwater levels are below normal over a several month period, or when the Drought Assessment Committee (DAC) determines that Phase II conditions exist based on other drought determination methods;
- **Phase III: Conservation Phase**—When the PDSI reads -2.0 to -4.0, and stream flows, reservoir levels, and groundwater levels continue to decline, along with forecasts indicating an extended period of below-normal precipitation, or when the DAC determines that Phase III conditions exist based on other drought determination models;
- **Phase IV: Drought Emergency**—When the PDSI is lower than -4.0, or when the DAC determines that Phase IV conditions exist based on other drought determination methods.

Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

Previous Occurrences

The NCEI database shows zero (0) drought events occurring in Howell County from 2017 through 2021.

Table 3.29. Previous Drought Occurrences 2017-2021

Drought Year	Duration	Property Damage	Crop Damage
2017	n/a	$0	$0
2018	n/a	$0	$0
2019	n/a	$0	$0
2020	n/a	$0	$0
2021	n/a	$0	$0

Probability of Future Occurrence

While NCEI data for the five year period between 2017 and 2021 shows no drought events, the ten year period from 2011 to 2021 shows moderate to exceptional drought conditions from June through November 20. The calculated risk percent from the number of months of drought (6 months) over the ten year period (119 months) equates to the annual average percentage of 5.04% probability of drought occurrence in the county.

Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought.

Changing Future Conditions Considerations

Drought frequently affects Missouri, including Howell County. Increasing temperatures due to a changing climate will inevitably accelerate evaporation rates and increase the frequency of droughts. It can be expected that rivers and groundwater reserves will experience significant reductions in available water with the increasing severity and frequency of droughts. It may be necessary in the future to restrict water usage in Howell County, which would mainly affect the county's agriculture industry and would diminish residents' quality of life.

Vulnerability

Vulnerability Overview

The agriculture sector is particularly vulnerable to drought. Periods of dry weather can reduce stock ponds and force the early sale of livestock. Crop production can be disrupted, and vegetative diseases can spread, reducing yields. Cities that operate water wells can experience water shortages during persistent drought periods like the seven-month drought period in 2012. Those that rely on private wells are more likely to be impacted by reductions in the groundwater supply due to the fact that public wells are far deeper than private wells.

Potential Losses to Existing Development

The 2018 State Plan states that from 1998 through 2018 there or $0 in insured crop loss payments in Howell County. The absence of payment could be due to the absence of crop insurance. There are no anticipated structural losses, loss of life, or injuries associated with this hazard. In addition, according to the NCEI estimates there were $808,000 in crop losses from 1996-2016. According to this data, the total losses divided by the 21 year timeframe equals $38,500 in estimated annualized crop losses.

Impact of Future Development

Increases in acreage planted with crops would add to exposure to drought-related agricultural losses. In addition, increases in population result in increased demand for treated water, adding additional strain on natural water supply systems.

Impact of Climate Change

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree.

The Natural Resources Defense Council developed a new water supply sustainability index. The risk to water sustainability is based on the following criteria:

- Projected water demand as a share of available precipitation
- Groundwater uses as a share of projected available precipitation
- Susceptibility to drought
- Projected increase in freshwater withdrawals
- Projected increase in summer water deficit

The risk to water sustainability for counties meeting two of the criteria are classified as “moderate”, while those meeting three of the criteria are classified as “high”, and those meeting four or more are classified as “extreme”. Counties meeting less than two criteria are considered to have low risk to water sustainability. According to the Natural Resources Defense Council, without climate change the water sustainability index for Howell County is “low”. With climate change, the water supply sustainability index is “low”.

Hazard Summary by Jurisdiction

Although the probability of drought is the same for the entire county, farming and livestock enterprises in the unincorporated parts of the county would feel the greatest impact. These impacts can be mitigated somewhat by the purchase of crop insurance. The existence of private farms and ranches are more concentrated in the western and southern portion of the county where the land is not under government ownership. The

communities of Brandsville, West Plains and Willow Springs each utilize groundwater wells for public water supply and could potentially be impacted during water shortages due to the reliance on these limited source wells.

Problem Statement

Although drought most likely will not cause structure damage, the impact is greatest on the agriculture sector and if persistent enough, could cause reductions in groundwater and water shortages in communities that provide potable water services. Potential solutions to mitigate the impact of drought would be for communities to develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc. during extreme drought periods. School districts can also implement water conservation measures at all district facilities.

3.4.6 Extreme Temperatures

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in Figure 3.20 uses both factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at-risk are those without shelter, those who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burstpipes.

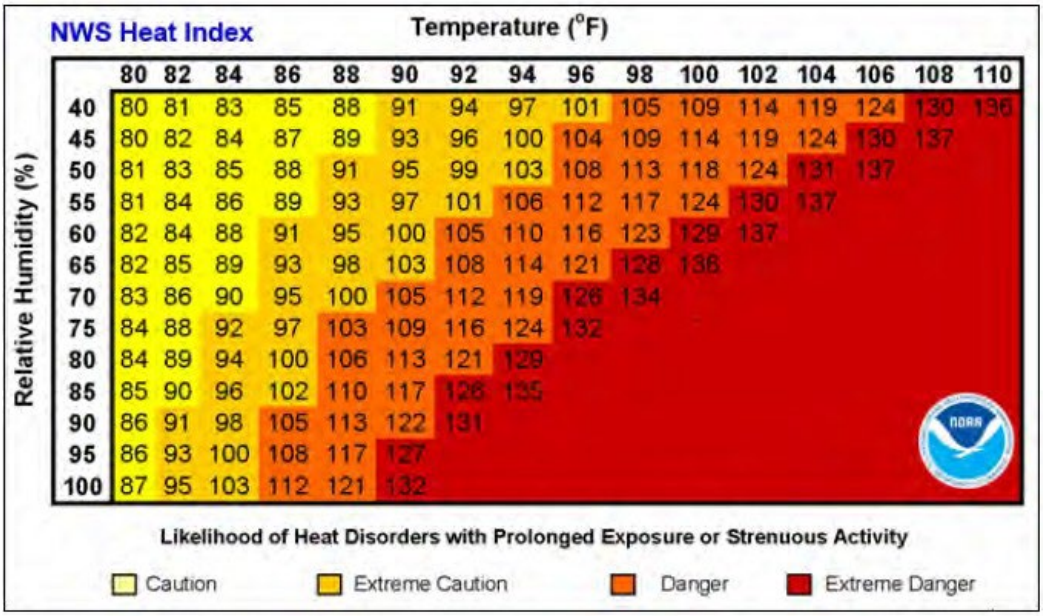
Geographic Location

Extreme heat is an area-wide hazard event, the risk of extreme heat does not vary across Howell County.

Strength/Magnitude/Extent

The National Weather Service (NWS) has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days: (1) when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F); and the night time minimum Heat Index is 80°F or above. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

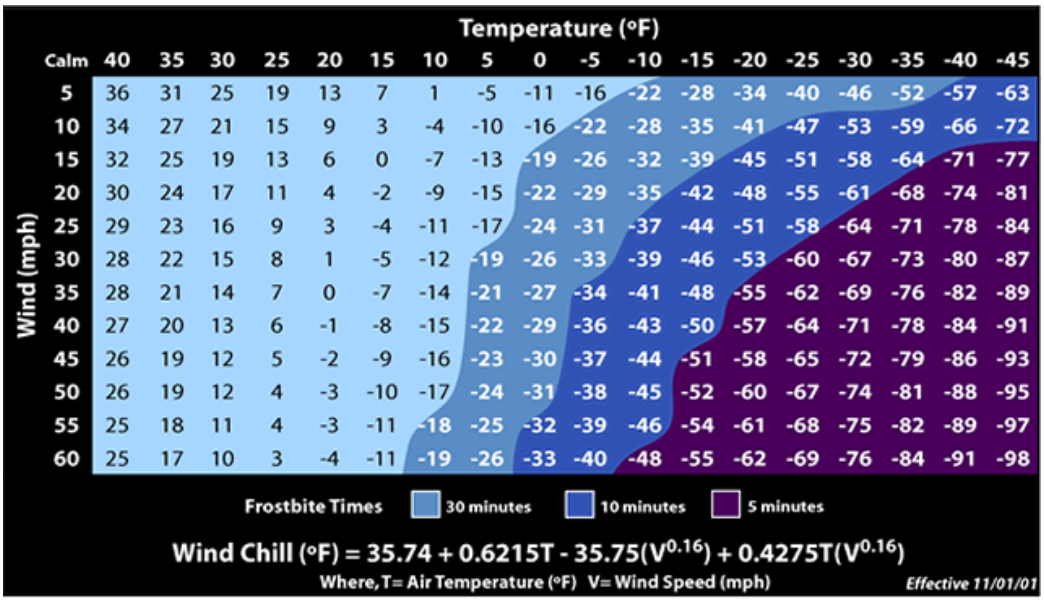
Figure 3.20. Heat Index (HI) Chart



Source: National Weather Service (NWS); https://www.weather.gov/safety/heat-index
Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

The NWS Wind Chill Temperature (WCT) index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. The figure below presents wind chill temperatures which are based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 3.21. Wind Chill Chart



Source: https://www.weather.gov/safety/cold-wind-chill-chart

Previous Occurrences

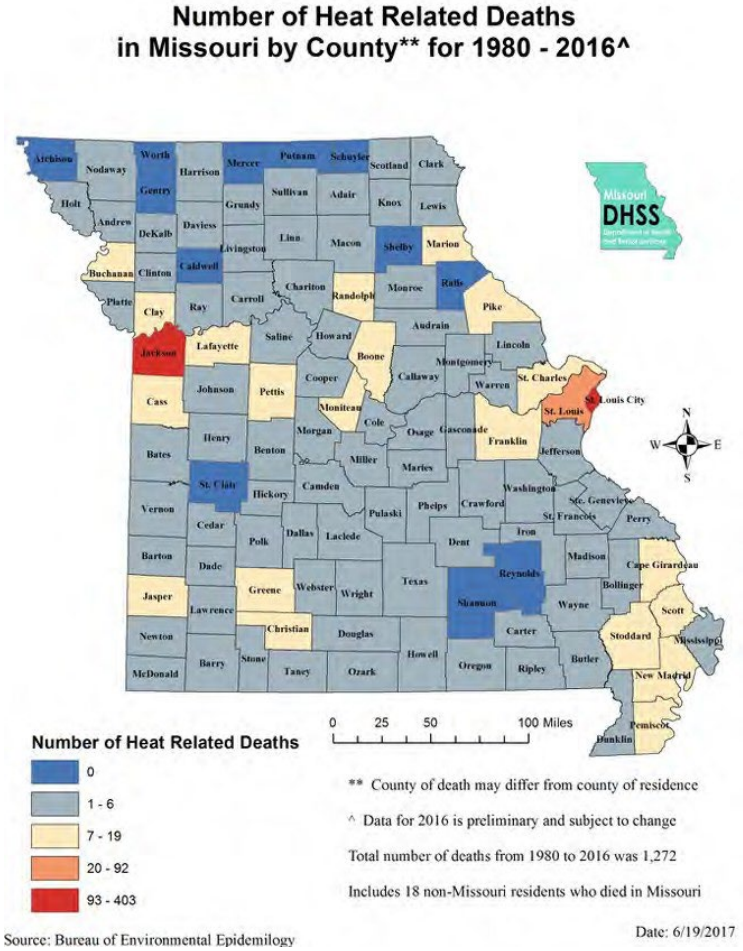
There are zero (0) recorded extreme heat events in the National Centers for Environmental Information (NCEI) database from 2017 to 2021 for Howell County.

There is one (1) Extreme Cold/Wind Chill event in the National Centers for Environmental Information (NCEI) database from 2017 to 2021 for Howell County with no resulting deaths, injuries or damages reported. The event narratives describe the episode as follows:

> An extended period of unseasonably cold weather gripped central and southwest Missouri between February 7 and February 18. The coldest temperatures and wind chills occurred from February 14 through February 16. Record to near record low temperatures were common on the mornings of February 15 and 16th with subzero lows and highs just in the single digits and teens above zero. In addition, wind chill readings between -20 and -30 were reported across the area.
>
> Along with the bitter cold, widespread snow occurred across central and southwest Missouri from the early morning hours of February 14 into the late afternoon hours of February 15. This created widespread snow covered roads and the cold and snow combined resulted in numerous if not all schools being closed.
>
> A minimum wind chill of -21 degrees was reported in West Plains and -20 degrees at the Mountain View RAWS site the morning of February 15th. In addition, morning lows on February 16th was -8 degrees in West Plains.

Figure 3.22 is a map created by The Missouri Department of Health and Senior Services (DHSS) for heat related fatalities by county. The map indicates that there have been between one (1) and six (6) heat related fatalities in Howell County from 1980 to 2017.

Figure 3.22. Heat Related Deaths in Missouri 2000 - 2017



Probability of Future Occurrence

The probability that an extreme cold/wind chill event will occur in Howell County in any given year is 20%. This equates to dividing the one (1) year with an event period by the total number of years in the record period from 2017 to 2021 (5) and multiplying by 100. The events recorded in the NCEI database describe prolonged periods where temperatures rose above at least 90 degrees for at least twelve consecutive days. Heat advisories and warnings are issued for shorter periods of extreme heat nearly every year and may not meet the threshold for consecutive days in the NCEI database. This data limitation indicates that extreme heat events could be underreported in the NCEI.

Changing Future Conditions Considerations

Under a higher emissions pathway, historically unprecedented warming is projected by the end of the century. Even under a pathway of lower greenhouse gas emissions, average annual temperatures are projected to exceed historical record levels most likely by the middle of the 21st century. For example, in southern Missouri, the annual maximum number of consecutive days with temperatures exceeding 95 degrees F is projected to increase by up to 20 days. Temperature increases will cause future heat waves to be more intense, a concern for this region which already experiences hot and humid conditions. If the warming trend conditions, future heat waves are likely to be more intense, and cold wave intensity is projected to decrease.

The impacts of extreme heat events are experienced most acutely by the elderly and other vulnerable populations. Higher demand for electricity as people tries to keep cool amplifies stress on power systems and may lead to an increase in the number of power outages. Atmospheric concentrations of ozone occur at higher air temperatures, resulting in poorer air quality, while harmful algal blooms flourish in warmer water temperatures, resulting in poorer water quality.

Mitigation against the impacts of future temperature increase may include increasing education on heat stress prevention, organizing cooling centers, allocating additional funding to repair and maintain roads damaged by buckling and potholes, and reducing nutrient runoff that contributes to algal blooms. Local governments should also prepare for increased demand on public recreational facilities, utility systems, and healthcare centers. Improving energy efficiency in public buildings will also present an increasingly valuable savings potential.

Vulnerability

Vulnerability Overview

Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.30 below lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.30. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

Potential Losses to Existing Development

Based on the information in the 2018 State Plan and DHSS, no heat related deaths have occurred in Howell County in the past 13 years. Therefore the likelihood of heat related death is unlikely, yet the possibility of occurrence should not be completely ruled out.

Impact of Previous and Future Development

Population growth can result in increases in the age groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population. The City of West Plains is the only community in Howell County that has experienced population growth between the period between 2010 - 2019. The other jurisdictions in the planning area have experienced population decline. Additionally, Howell County has a significantly aging population which can be particularly prone to extreme temperatures.

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2020 Census ACS Estimates on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. Table 3.31 below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.31. County Population Age Dynamics

Jurisdiction	Population Under Age 5	Population Aged 65 and Over
Howell County	2,711 / 6.7%	7,206 / 18.8%
City of Brandsville	2 / 0.8%	23 / 17%
City of Mountain View	151 / 5.7%	669 / 25.1%
City of West Plains	938 / 7.7%	2,276 / 18%
City of Willow Springs	188 / 8.6%	436 / 21%

Source: U.S. Census Bureau, (*) includes entire population of each city or county

Schools in the county have proper air-conditioning and heating and follow proper procedures in the event of extreme temperatures. However, daycare and eldercare facilities may be at risk of heat related injuries if facilities are not properly cooled.

Problem Statement

Older and younger segments of the population are more vulnerable to the impact of extreme heat. In addition, people living below the poverty level may be more vulnerable during periods of extreme temperatures due to a lack of air conditioning or heating in their homes. Institutionalized populations, such as those living in nursing homes, become more vulnerable to extreme temperatures due to power outages.

To help reduce the risk of death, heating and cooling centers should be promoted and known to the public, especially to those who have young children or are over the age of 65. Partnering with local community organizations to continue to donate fans and offer weatherization programs would mitigate the impact on vulnerable populations in the county.

3.4.7 Severe Thunderstorms

Including High Winds, Hail, and Lightning

Hazard Profile

Hazard Description

Thunderstorms

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding (discussed separately in **Section 3.4.1)** and tornadoes (discussed separately in **Section 3.4.9**).

High Winds

A severe thunderstorm can produce winds causing as much damage as a weak tornado. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour.

Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and is has been known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity that shoots through the air causing vibrations and creating the sound ofthunder.

Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow before it hits theearth.

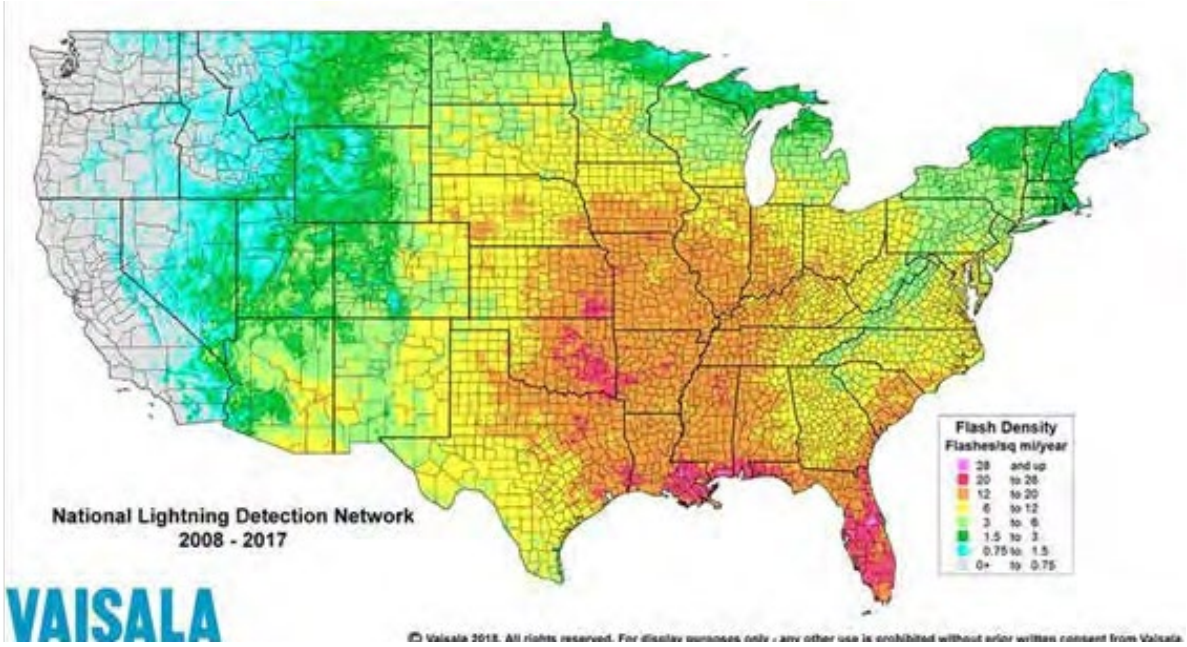
At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone in diameter recorded in the United States was found in Vivian, South Dakota on July 23, 2010. It was eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

Geographic Location

Thunderstorms/high winds/hail/lightning events are an area-wide hazard that can happen anywhere in the county. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed

urban areas.

Figure 3.23. Location and Frequency of Lightning in Missouri



Source: National Weather Service, https://www.vaisala.com/en/product/1256

Strength/Magnitude/Extent

Based on information provided by the Tornado and Storm Research Organization (TORRO), Table 3.32 below describes typical damage impacts of the various sizes of hail.

Table 3.32. Tornado and Storm Research Organization Hailstorm Intensity Scale

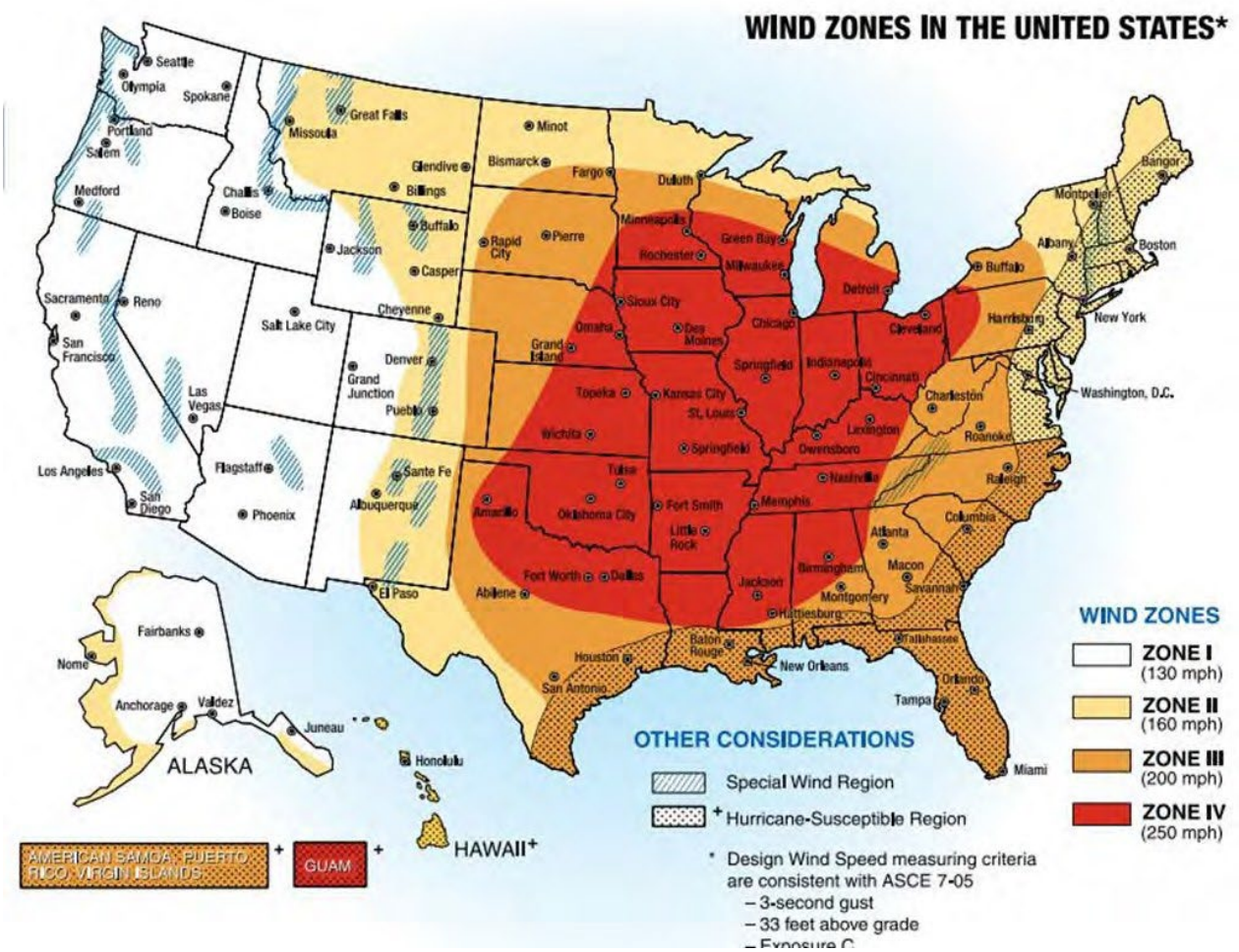
Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Straight-line winds are defined as any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour, which represent the most common type of severe weather. They are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment.

Figure 3.24 below shows wind zones in the United States. Howell County lies in Zone IV, the zone with the highest possible wind speeds in the country.

Figure 3.24. U.S. Wind Zones



Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. http://www.torro.org.uk/site/hscale.php

Previous Occurrences

Thunderstorm Wind

There are sixty-five (65) Thunderstorm Wind events reported to the NCEI from 2017-2021. Thirty-two (32) of these events resulted in reported property damages. The total damages from these events include $536,000 in property damages with average losses per damaging event totaling $16,750. One (1) event resulted in injuries.

The costliest event occurred on May 4, 2020 and is described as follows in NCEI narratives:

> The first of three rounds of storms occurred as a front interacted with very unstable air to produce numerous severe thunderstorms that caused extensive hail and wind damage over portions of the area. Hail larger than golf balls was reported over the south side of Springfield. As the storms moved from west to east across the area, they transitioned from primarily hail producers to wind producers after passing the Highway 65 corridor.
>
> The second round of storms developed near Topeka, KS and roared southeastward into east-central Missouri in the early afternoon. These storms then impacted the eastern Ozarks during the late afternoon hours, producing substantial straight-line wind damage. The Lebanon Airport anemometer recorded a wind speed of 89 mph before going offline. There were several reports of tornadoes associated with this second line of storms, but none could be confirmed. The final round of severe storms developed in the late afternoon and evening along a warm front over southeast Kansas and far southwest Missouri, producing primarily large hail.
>
> A line of severe storms moved east across the county. Numerous power outages occurred between Vanzant and Willow Springs. A sheriff deputy noted numerous trees down in the state forest near County Road 423 and AM Highway. Near Peace Valley a barn suffered significant damage. Reports of tornadoes were received over northern Howell County but these could not be confirmed.

Table 3.33. NCEI T-Storm Wind Events in Howell County 2017-2021

Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Howell County	36	0	5	$146,000	$0
Brandsville	2	0	0	$ 60,000	$0
Mountain View	8	0	0	$146,000	$0
West Plains	15	0	0	$159,000	$0
Willow Springs	4	0	0	$ 25,000	$0
Total	**65**	**0**	**5**	**$536,000**	**$0**

Hail

There are forty-two (42) Hail events reported to the NCEI in Howell County from 2017-2021. There were four events during this time with hailstones measuring 1.75 inches in diameter. There were, however, no reports of property or crop damage associated with these events. Table 3.34 provides information about hail events in the county.

Table 3.34. NCEI Hail Events in Howell County 2017-2021

Location	# of Events	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Howell County	25	0.75 to 1.75-inch	0	0	$0	$0
Brandsville	1	1.25-inch	0	0	$0	$0
Mountain View	1	1.75-inch	0	0	$0	$0
West Plains	11	0.75 to 1.0-inch	0	0	$0	$0
Willow Springs	4	1.0 to 1.75-inch	0	0	$0	$0
TOTALS	**42**	**-**	**0**	**0**	**$0**	**0**

Source: NCEI; 2017

Lightning

There are two (2) lightning events recorded in the NCEI data from 2017-2021. Both of these events included reported property damages. The costliest events occurred on May 19, 2018. The event is described in NCEI narratives as follows:

Table 3.35. NCEI Lightning Events in Howell County 2010-2020

Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Howell County	1	0	0	$ 100	$0
Brandsville	0	0	0	$0	$0
Mountain View	1	0	0	$1,000	$0
West Plains	0	0	0	$	$0
Willow Springs	0	0	0	$0	$0
Total	2	**0**	**0**	**$1,100**	**$0**

Probability of Future Occurrence

Thunderstorm Wind

There have been sixty-five (65) recorded unique thunderstorm wind events over a 5-year period from 2017-2021. This equates to thirteen (13) thunderstorm wind occurrences in any given year with a 100% probability of occurrence.

There were thirty-two (32) events with reported property damages totaling $536,000 for the five-year period. This equates to an average of 6.4 damaging events per year with average annual losses of $107,200.

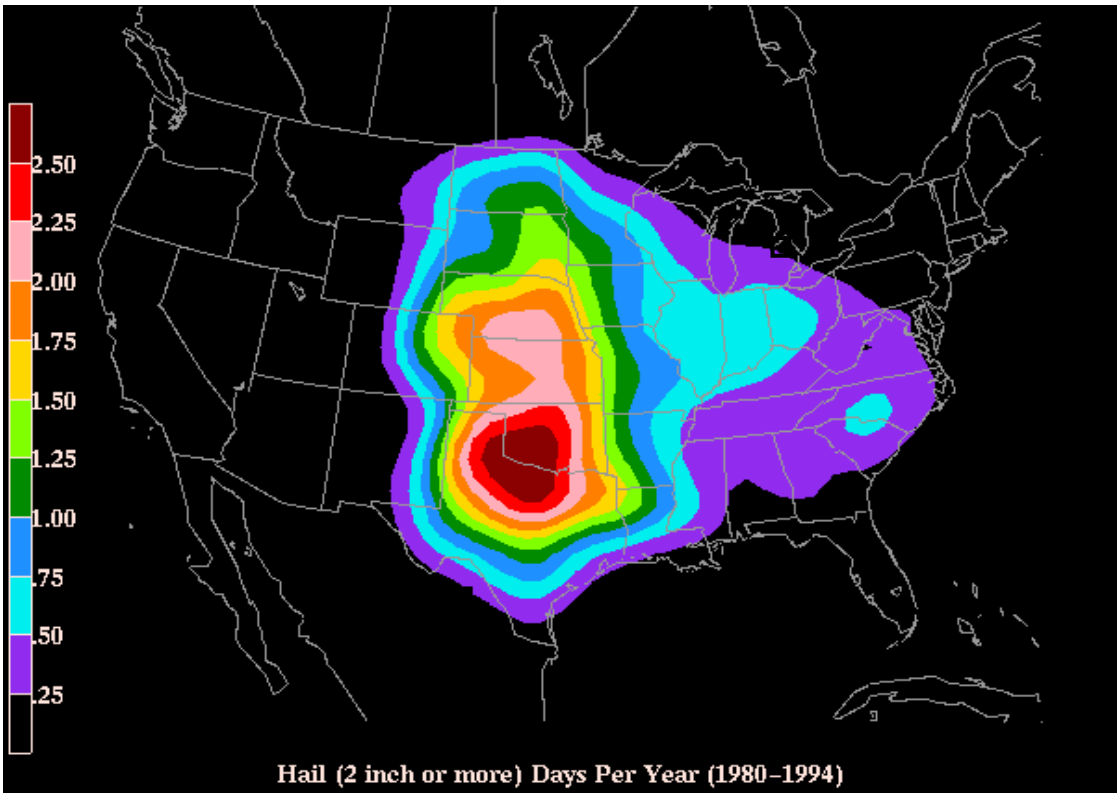
Hail

There have been forty-two (42) recorded hail events over a 5-year period from 2017-2021. This equates to 8.4 hail events in any given year with a 100% probability of occurrence. There was no reported property damage associated with these 42 events.

Lightning

There have been two (2) recorded lightning events over the 5-year period from 2017-2021. This equates to an 40% probability of occurrence. The two events resulted in a total of $1,100 of property damage. Annualized losses from lightening events is $220 per year.

Figure 3.25. Annual Hailstorm Probability - 2" diameter or larger - 1980- 1994



Source:NSSL,http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif

Lightning

It is known that the occurrence of severe thunderstorms includes the risk of damaging and potentially life-threatening lightning strikes. However, the NCEI database does not include any recorded occurrences of lightning events from the years 2010-2020. Though unlikely, the statistical occurrence probability of lightning events based on a 11-year record period in 0%.

Changing Future Conditions Considerations

Increases in temperature and more frequent droughts will accelerate the evaporation of water into the atmosphere, which will produce higher water concentrations. Elevated levels of moisture raise the likelihood of severe thunderstorms and tornadoes. Lives and property are endangered when the risk of these events increases, especially in jurisdictions that do not have a community safe room or the funds to construct one. This kind of event also possesses the threat of increasing the magnitude and frequency of other hazard events like riverine flooding, sinkhole occurrence, and flash flooding, putting residents in even greater danger.

Vulnerability

Vulnerability Overview

High winds, hail, and lightning pose varying risk for jurisdictions in Howell County. Downbursts resulting from thunderstorms can be just as damaging as an EF-1 tornado. High winds have resulted in $536,000 in total property damage. Poorly built structures, barns, and outbuildings are most vulnerable to the impact of high winds during thunderstorms. Both high winds and hail can damage roofs. Hail can also damage crops and dent

the exterior of vehicles. Total hail damage recorded in the NCEI database for Howell County over a 10-year record period has been $20,000 for an annualized loss of $1,000 per year. Lighting can cause wildfires and structure fires, damage utilities causing power outages, or result in injury or death. The NCEI reports no lightning storm events for Howell County in their database for the 10-year record period.

Potential Losses to Existing Development

The average annual loss determined from historical losses for high wind and hail are indicators of the potential losses to existing development. High wind events in the county have the potential to damage critical facilities, school facilities, local government properties, and private property alike. Potential annual losses for high wind and hail events are $60,800 and $1,000, respectively.

Future Development

The City of West Plains is the fastest growing community in Howell County. The unincorporated County and the City of Willow Springs are also growing, but at a slower pace. Additional development in these areas will result in the exposure of more households and business vulnerable to damages from high winds, hail and lightning.

Hazard Summary by Jurisdiction

Although thunderstorm high winds, hail and lightning are area-wide events, the communities of Howell County have varying degrees of percentage of structure built prior to 1939 – which are considered to be more vulnerable to the impacts of these events. The City of Willow Springs is home to the highest percentage of structures built prior to 1939 at 19%, followed by West Plains (11%), Brandsville (11%) and the unincorporated County (10%). The county's school districts have mostly modernized facilities and are considered well-built structures. However, most districts have outbuildings used for storage and maintenance that may be at higher risk to high wind and hail events.

Problem Statement

Poorly built structures, barns, outbuildings are more vulnerable to the impact of high winds during thunderstorms. High winds can topple utility poles and lead to widespread or localized power outages. Both high winds and hail can damage roofs. Hail can also damage crops and vehicles. People are also at risk to injury and death during high wind and lightning events. Crop insurance can mitigate the risk to farmers and the agriculture sector within the county. Lightning events have also been known to cause structure fires.

The risk of property damage, injury and death in the county can potentially be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not currently have a safe room. Retrofitting school district facilities with protective filming of windows and installation of blast proof doors will provide more protection for students and staff at school facilities. Additional warnings and alerts will also provide the public and schools more time to take cover during high wind events. In addition, public safety fairs and expos in the county could provide an opportunity to disseminate information to citizens about individual saferoom construction. Education and hazard awareness programs in public schools would also increase public safety in the event of severe thunderstorm occurrence.

3.4.8 Severe Winter Weather

Hazard Profile

Hazard Description

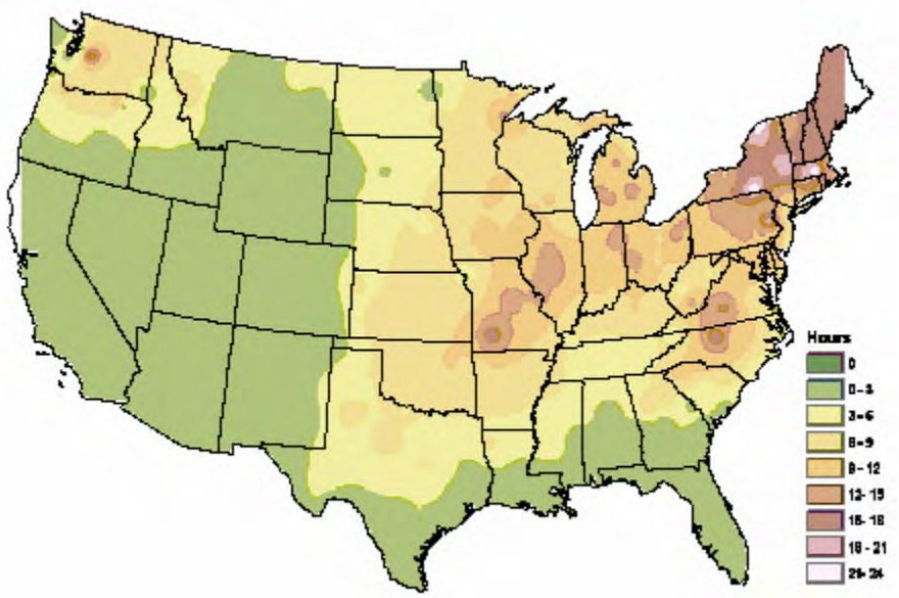
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Geographic Location

The entire county is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. Figure 3.26 depicts the average number of hours per year with freezing rain. Howell County is located in a zone that can expect 9-12 hours of freezing rain per year.

Figure 3.26. NWS Statewide Average Number of Hours per Year with Freezing Rain



Source: American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf

Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also, at risk are those without shelter, those who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

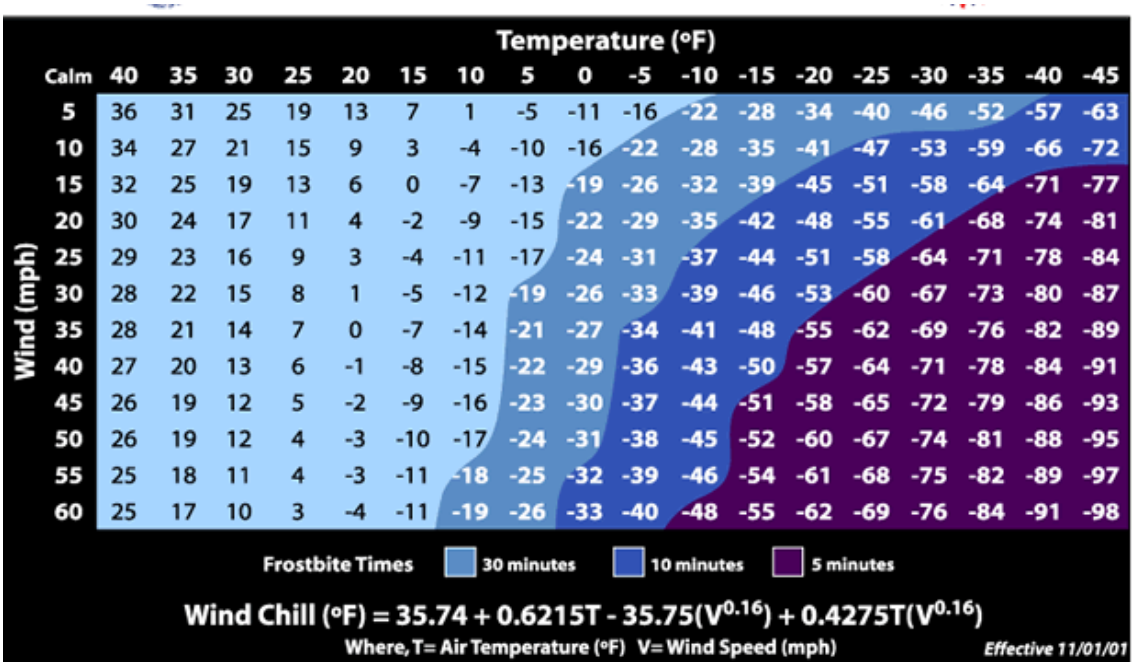
Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general, heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. Ice accumulation during winter storm events damage to power lines due to the ice weight on the lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacement of damaged facilities and lost economic opportunities for businesses.

Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. Standard values for loss of service for utilities reported in FEMA's 2009 BCA Reference Guide, the economic impact as a result of loss of power is $126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service**,** Figure 3.27 on the following page shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.27. Wind Chill Chart



Source: National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml

Previous Occurrences

Table 3.36 below details the number of winter weather events that have occurred in Howell County between the years 2000-2020.

Table 3.36. NCEI Howell County Winter Weather Events Summary, 2017-2021

Type of Event	# of Events	# of Injuries	Property Damages	Crop Damages
Heavy Snow	0	0	0	0
Ice Storm	1	0	0	0
Winter storm	0	0	0	0
Winter Weather	7	0	$5,000	0
Total	**8**	**0**	**$5,000**	**0**

Source: NCEI, 2021

Of the eight events listed in the NCEI data, one (1) was an Ice Storm and seven (7) were listed as Winter Weather.

Ice Storm

The Ice Storm event took place on January 11, 2019, and is described in NCEI narrative as follows:

> A winter storm that started as rain as it moved into central and southern Missouri, then turned to a wintry mix of sleet, freezing rain and snow before changing over to all snow in some areas. Heavy snow fell across central Missouri with accumulations between 6 and 12 inches. Portions of south central Missouri saw significant ice accumulations that resulted in power outages and numerous trees and limbs down. As the precipitation was winding down, areas of freezing drizzle persisted through the overnight hours of January 12.
>
> Storm total flat ice accumulation from the West Plains, MO ASOS was 0.44 inches, with a radial ice accumulation of 0.17 inches. Public reported large tree limbs (6 to 8 inches in diameter) down due to ice accumulation 3 miles north-northeast of Willow Springs.

Winter Weather

Of the seven (7) reported winter weather events during the 5-year period, one resulted in reported losses of $5,000 and is described as follows in the NCEI narratives:

> A storm system lifted northward through Arkansas and into Missouri from New Years Eve into New Years Day. Freezing rain spread into southeast Kansas and southern and central Missouri during the evening hours of Thursday, December 31. The freezing rain continued into January 1, 2021 before transitioning over to minor accumulations of snow. Ice accumulations overnight and into January 1, 2021 resulted in tree damage and scattered power outages. Once the freezing rain changes to snow with a dusting to 1.5 inches of accumulation was reported.
>
> Total flat ice accumulations from the West Plains ASOS was 0.24 inches. This was a continuation of the storm from December 31, 2020.

Changing Future Conditions Considerations

Shorter overall winter seasons and fewer days of extreme cold may have both positive and negative indirect impacts. Warmer winter temperatures may result in changing distributions of native plant and animal species and/or an increase in pests and non-native species. Warmer winter temperatures will result in a reduction of lake ice cover. Reduced lake ice cover impacts aquatic ecosystems by raising water temperatures. Water temperature is linked to dissolved oxygen levels and many other environmental parameters that affect fish, plant, and other animal populations. A lack of ice cover also leaves lakes exposed to wind and evaporation during a time of year when they are normally protected.

As both temperature and precipitation increase during the winter months, freezing rain will be more likely. Additional wintertime precipitation in any form will contribute to saturation and increase the risk and/or severity of spring flooding. A greater proportion of wintertime precipitation may fall as rain rather than snow

Probability of Future Occurrence

The probability for all the different type of winter weather is included as one probability since one storm generally incudes several different types of events. There were eight (8) severe winter weather events in Howell County from 2017-2021. This equates to a 100% probability of occurrence in any given year with an average of 1.6 events in any given year.

Vulnerability

Vulnerability Overview

Severe winter storms include extreme cold, heavy snowfall, ice and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the excessive snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. People over 65 and those living in poverty have an increased risk of hypothermia and frostbite due to extreme cold and wind chill hazards.

In the 2018 State Plan, seven factors were considered in determining overall severe winter storm vulnerability as follows: housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims and social vulnerability. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, to rank each county's vulnerability to severe winter weather. Howell County received a vulnerability rating of medium with Property Loss Ratio being rated "4" and Social Vulnerability being rated "5".

Potential Losses to Existing and Future Development

During the 5-year period of record from 2017-2021, $5,000 in property damage was reported as a result of severe winter storms.

Future Development

Increased development and resulting increase in population will increase exposure to damage from severe winter weather. Future commercial development can expect functional downtime and decreased revenues during periods of severe winter weather. Road construction in the county will increase the need for snow removal and slat to keep transportation lifelines open during periods of severe winter weather.

Hazard Summary by Jurisdiction

Severe winter weather can cause power outages and put structures at risk to fires when individuals in homes resort fuel heaters. The risk of extreme cold deaths and frostbite varies among segments of the populations. People over 65 and those living below the poverty level have an increased vulnerability to severe winter weather. Table 3.37 includes information on population over 65 and the percent living below the poverty level by jurisdiction.

Table 3.37. Population over 65 and Percent Living Below the Poverty Level by Jurisdiction

Jurisdiction	% of Families Living Below Poverty Level	% Population over 65
Howell County	18.4	19.8
City of Brandsville	20.5	33.1
City of Mountain View	19.0	25.2
City of West Plains	23.9	18.1
City of Willow Springs	21.3	19.6

Source: ACS Profiles; ACS five year estimates 2020

All jurisdictions have large percentages of families living below the poverty level. The Cities of Brandsville and West Plains have the highest percentages of impoverished families. The largest populations of people over 65—by percentage—reside in Brandsville and Mountain View. These communities have the greatest risk based on these populations.

Problem Statement

Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make travelled extremely difficult and hazardous. People over 65 and those living in poverty have an increased risk of hypothermia and frostbit due to extreme cold and wind chill.

It is important that the Howell County EMA maintain a list of heating centers throughout the county as they become available. These locations could be promoted through avenues such as radio, Facebook or the county government's website. These locations can provide individuals who are at risk refuge from periods of extreme cold. Public works departments can develop snow removal plans and maintain adequate snow removal equipment and slat to quickly open roads after periods of heavy snow and freezing rain. The county and cities can work with local electric cooperatives to development vegetation management programs in rights of way to minimize damages of falling tree limbs laden with ice resulting from ice storms to minimize power outages throughout the county.

3.4.9 Tornado

Hazard Profile

Hazard Description

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States. The unique geography of the central United States allows for the development of thunderstorms that spawn tornadoes. The jet stream, which is a high-velocity stream of air, determines which area of the central United States will be prone to tornado development. The jet stream normally separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun "moves" north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine. During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

Tornadoes spawn from the largest thunderstorms. The associated cumulonimbus clouds can reach heights of up to 55,000 feet above ground level and are commonly formed when Gulf air is warmed by solar heating. The moist, warm air is overridden by the dry cool air provided by the jet stream. This cold air presses down on the warm air, preventing it from rising, but only temporarily. Soon, the warm air forces its way through the cool air and the cool air moves downward past the rising warm air. This air movement, along with the deflection of the earth's surface, can cause the air masses to start rotating. This rotational movement around the location of the breakthrough forms a vortex, or funnel. If the newly created funnel stays in the sky, it is referred to as a funnel cloud. However, if it touches the ground, the funnel officially becomes a tornado.

A typical tornado can be described as a funnel-shaped cloud that is "anchored" to a cloud, usually a cumulonimbus that is also in contact with the earth's surface. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National Weather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to 70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening but have been known to occur at all hours of the day and night.

Geographic Location

Tornadoes can occur anywhere in the planning area.

Strength/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (see Table 3.38) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F Scale was implemented in the U.S. on February 1, 2007.

Table 3.38. Enhanced F Scale for Tornado Damage

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest ¼-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

Source: The National Weather Service, www.spc.noaa.gov/faq/tornado/ef-scale.html

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in Table 3.39 The damage descriptions are summaries. For the actual EF scale, it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at: www.spc.noaa.gov/efscale/ef-scale.html.

Tornado Saferoom – Missouri State University—West Plains

Table 3.39. Enhanced Fujita Scale with Potential Damage

Enhanced Fujita Scale			
Scale	**Wind Speed (MPH)**	**Relative Frequency**	**Potential Damage**
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores 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	0.7%	Devastating. Well-constructed houses and whole frame houses completely levelled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses levelled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/ef-scale.html

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

Previous Occurrences

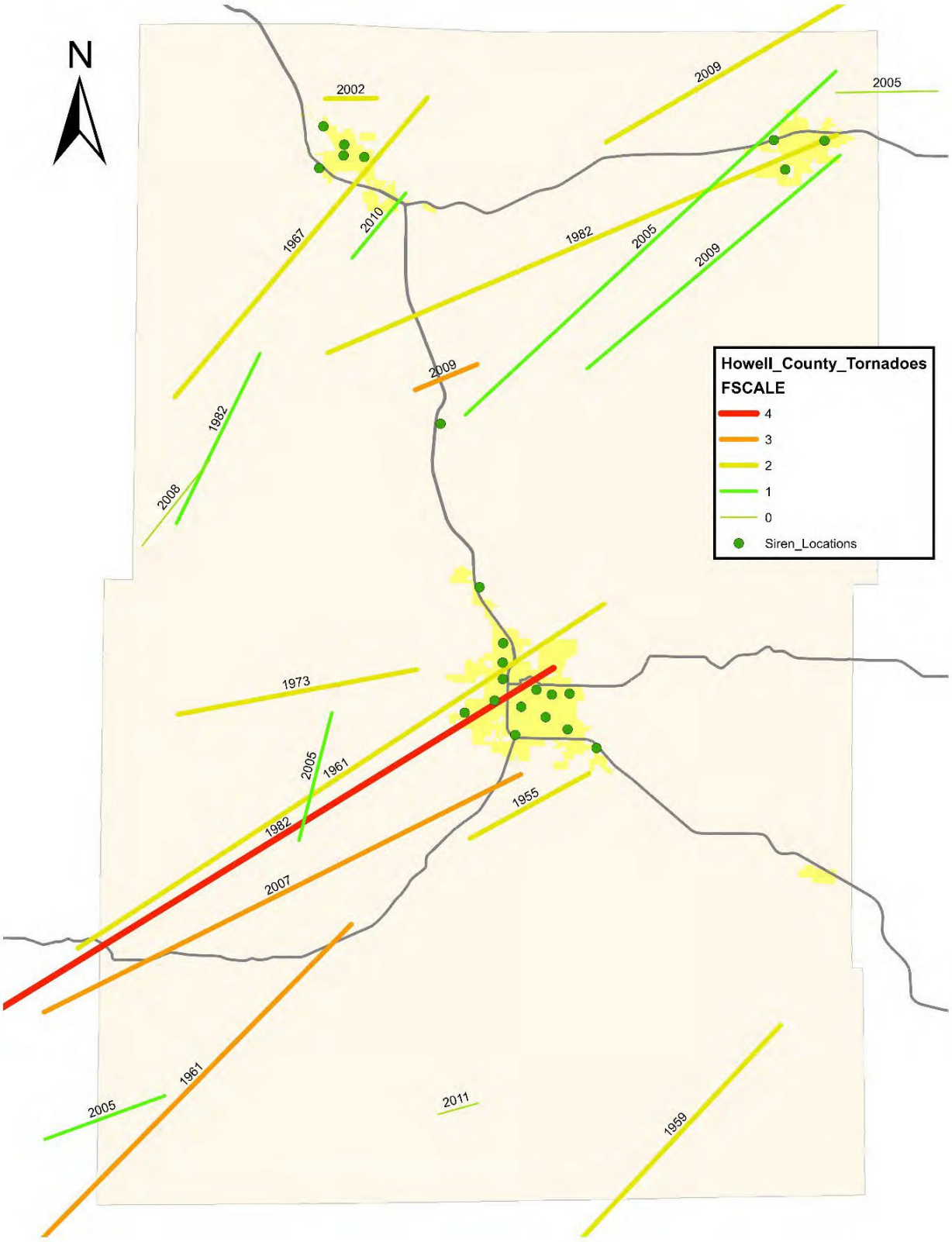
There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments.

Table 3.40. Recorded Tornadoes in Howell County, 2017-2021

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
4/30/2019	Not listed	Not listed	2.18	100	EF0	0	0	$12,000	$0
10/21/2019	3E Fields Store	3E Fields Store	0.11	50	EF0	0	0	$0	$0
	Total	-	-	-	-	**0**	**0**	**$12,000**	**0**

Source: National Centers for Environmental Information, http://www.NCEI.noaa.gov/stormevents/

Figure 3.28. Howell County Map of Historic Tornado Events



Source: Missouri Tornado History Project, http://www.tornadohistoryproject.com/tornado/Missouri

Probability of Future Occurrence

According to the NCEI, two (2) tornadoes have occurred during the 5-year period from 2017-2021 resulting in a probability percentage of 40% of a tornado of any magnitude event in the planning area in any given year.

Changing Future Conditions Considerations

Scientists do not know how the frequency and severity of tornadoes will change. Research published in 2015 suggests that changes in heat and moisture content in the atmosphere, brought on by a warming world, could be playing a role in making tornado outbreaks more common and severe in the U.S. The research concluded that the number of days with large outbreaks have been increasing since the 1950s and that densely concentrated tornado outbreaks are on the rise. It is notable that the research shows that the area of tornado activity is not expanding, but rather the areas already subject to tornado activity are seeing the more densely packed tornadoes. Because Missouri experiences on average around 39.6 tornadoes a year, such research is closely followed by meteorologists in the state.

Vulnerability

Vulnerability Overview

According to the 2018 State Plan, the following six factors were considered in determining overall tornado vulnerability: building exposure, population density, social vulnerability, percentage of mobile homes, likelihood of occurrence, and annual property loss. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, ranking each county's vulnerability totornadoes.

Howell County received the following vulnerability rating for each factor: building exposure – low medium (2), population density – low (1), social vulnerability – medium (3), percentage of mobile homes – medium high (4), likelihood of occurrence – high (5), and annual property loss – high (2). This equates to an overall vulnerability rating of High.

Figure 3.29. Tornado Alley in the U.S.

Source: http://www.tornadochaser.net/tornalley.html

Potential Losses to Existing Development During the 5-year period from 2017-2021, a total of **$12,000** in property losses equatesto
$2,400 in average annual losses countywide. This value indicates that potential future losses in the county will remain significant. The most common tornado events recorded in the county are EF0 magnitude. The average magnitude for tornado events in the county is 0.42 on the Enhanced Fujita Scale.

Previous and Future Development

Howell County as whole is experiencing moderate growth. The fastest growing community is the City of West Plains, the County Seat. It is anticipated that the unincorporated county will see the most growth on the central portion of the county. This part of the county is nearest to the region's largest city, West Plains, and does not have nearly as much land that is utilized for agricultural purposes. Additional population growth and development will increase exposure and risk to tornado events due to the area-wide geographic nature of this hazard.

Hazard Summary by Jurisdiction

Although tornado events are area-wide hazards, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of tornadoes. The City of Willow Springs is home to the highest percentage of structures built prior to 1939 at 19%, followed by West Plains (11%), Brandsville (11%) and the unincorporated County (10%). The county's school districts have mostly modernized facilities and are considered well-built structures. However, most districts have outbuildings used for storage and maintenance that may be at higher risk to high wind and hail events.

School district facilities are at risk to the damages of tornadoes. Risk to student population has been mitigated by the construction of a saferooms at several Howell County Schools. These include Willow Springs Middle School, West Plains Middle School, Glenwood, Howell Valley, Fairview, and Missouri State University-West Plains. Additional Notice of Interest for more saferooms in the County are on file at the State Emergency Management Agency.

Problem Statement

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Significant tornado events in Howell County since 1950 have resulted in deaths (4) numerous injuries (63) and millions of dollars in property damage ($39.55MM). Information in the 2018 State Plan indicates that Howell County has a high vulnerability to tornadoes based on frequency of occurrence and previous damages.

The risk of property damage, injury and death in the county can be mitigated by constructing FEMA standard saferooms in facilities that house vulnerable populations such as nursing homes, government buildings, and schools. In addition, identifying safe refuge areas in public buildings, nursing homes and other facilities with protective filming of windows and installation of blast proof doors will provide more protection for students and staff and school facilities that are not served by FEMA standard saferooms. Additional warnings and alerts will also provide the public and schools more time to take cover during tornado warnings. Aldo, public safety fairs and expos in the county hosted by communities provide an opportunity to disseminate information to homeowners about individual saferoom construction in residences.

Cities can adopt or update and enforce IBC 2012 building codes that include construction techniques such as roof tie down straps to mitigate damage to future development.

3.4.10 Wildfire

Hazard Profile

Hazard Description

The fire incident types for wildfires include: 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation, crop fire.

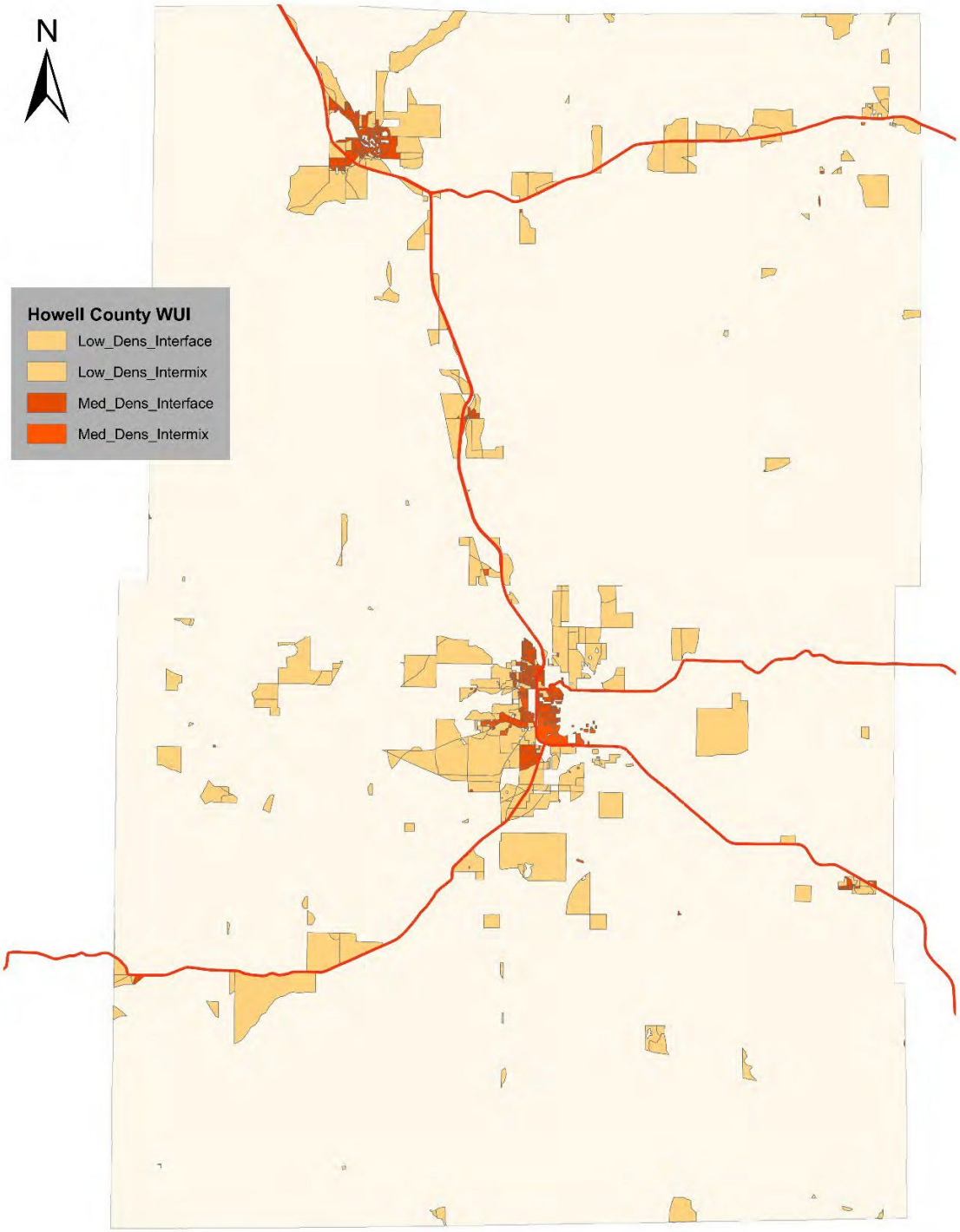
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works closely with volunteer fire departments and federal partners to assist in fire suppression activities. Currently, more than 900 rural fire departments in Missouri have mutual aid agreements with the Forestry Division to obtain assistance in wildfire protection if needed.

Most of Missouri fires occur during the spring season between February and May. The length and severity of wildland fires depend largely on weather conditions. Spring is Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents to burn their garden spots, brush piles, and pastures in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush accumulation. Therefore, spring months are the more dangerous for wildfires. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

Geographic Location

Absent demographic information indicating otherwise, the risk of structural fire probably does not vary widely across the planning area. However, damages due to wildfires would be higher in communities with more wildland–urban interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. Figure 3.30 shows WUI areas in Howell County.

Figure 3.30. Howell County Wildland Urban Intermix, Interface



Severity/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

Table 3.41. Howell County Wildfires 2017 - 2021

Year	# Wildfires	Buildings Destroyed	Buildings Damaged	Buildings Threatened	Acres Burned
2017	91	11	3	43	588.41
2018	70	6	1	21	959.18
2019	46	3	3	27	251.63
2020	48	1	23	26	1,297.30
2021	58	0	0	15	1,795.30
Total	**313**	**21**	**30**	**132**	**4,891.82**

While very unusual, crown fires can and do occur in Missouri native hardwood forests during prolonged periods of drought combined with extreme heat, low relative humidity, and high wind. Tornadoes, high winds, wet snow and ice storms in recent years have placed a large amount of woody material on the forest floor that causes wildfires to burn hotter and longer. These conditions also make it more difficult for fire fighters suppress fires safely.

Often wildfires in Missouri go unnoticed by the general public because the sensational fire behavior that captures the attention of television viewers is rare in the state. Yet, from the standpoint of destroying homes and other property, Missouri wildfires can be quite destructive.

Previous Occurrences

According to MDC Wildfire Data, there have been 313 wildfires reported in Howell County from 2017 to 2021. A total of 4,891.82 acres were burned as a result of these reported wildfires. In addition, 21 buildings were destroyed, 30 structures were damaged, and 132 structures were threatened as a result of the wildfires in the county.

There are no records from school districts and special districts about previous wildfire events and the damages resulting from them.

P*robability of Future Occurrence*

Based on the last five (5) years of fire reporting statistics from the Missouri Department of Conservation (MDC) in Table 3.41, there were a total of 313 reported wildfires from 2017-2021. This equates to an average of 62.6 wildfire events annually and a 100% probability of occurrence in any given year.

Changing Future Conditions Considerations

Higher temperatures and changes in rainfall are unlikely to substantially reduce forest cover in Missouri, although the composition of trees in the forests may change. More droughts would reduce forest productivity, and changing future conditions are also likely to increase the damage from insects and diseases. But longer growing seasons and increased carbon dioxide concentrations could more than offset the losses from those factors. Forests cover about one-third of the state, dominated by oak and hickory trees. As the climate changes, the abundance of pines in Missouri's forests is likely to increase, while the population of hickory trees is likely to decrease 0.

Higher temperatures will also reduce the number of days prescribed burning can be performed. Reduction of prescribed burning will allow for growth of understory vegetation – providing fuel for destructive wildfires. Drought is also anticipated to increase in frequency and intensity during summer months under projected future scenarios. Drought can lead to dead or dying vegetation and landscaping material close to structures which creates fodder for wildfires within both the urban and rural settings.

Vulnerability

Vulnerability Overview

Wildfires occur throughout wooded and open vegetation areas of Missouri. They can occur any time of year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes, and in rare instances, spontaneous combustion. Structures and people in Wildland-Urban Interface areas in the county and cities are more vulnerable to the impact of wildfires due to the level of fuel mixed with structures.

Potential Losses to Existing Development

In looking at the statistics over the last eleven years, an average of 4.2 buildings are destroyed every year, and six buildings per year are damaged. Another 26.3 structures are threatened per year with an average of 978 acres burned annually.

Impact of Future Development

It is anticipated that there will be future development in WUI areas throughout incorporated and unincorporated areas of the county. Future growth in WUI areas of the county will increase the risk and exposure to wildfires.

Hazard Summary by Jurisdiction

The vulnerability to wildfire damages are greatest near the counties two most populous communities West Plains and Willow Springs. Areas identified as WUI, but with lower associated risk are along the major US highways in the county where the densest development is occurring in the unincorporated parts of the county. These areas include US Highway 60 east of Willow Springs, and along US Highway, southwest of West Plains. All school district campuses in the county are located outside areas identified as interface and/or intermix.

Problem Statement

Wildfire occurrence is frequent within Howell County. These events can destroy, damage, and threaten structures in hazard prone areas. Populations and structures in WUI areas of the county have an increased risk to wildfires due to the level of fuel mixed with built environments. Cities have not adopted landscape ordinances that could potentially include fire safe landscape design requirements. The unincorporated areas of the county have the highest risk and exposure to wildfires. Thankfully, many of these areas are sparsely population. However, when new construction is occurring promoting the use of fire-resistant construction materials is highly advisable. More information about these materials and techniques are available in the MDC publication *Living with Wildfire*.

4 MITIGATION STRATEGY

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy updated by the Mitigation Planning Committee (MPC) based on the [updated] risk assessment. The mitigation strategy was developed through a collaborative group process. The process included review of [updated] general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's *Local Hazard Mitigation Review Guide (October 1, 2016)*.

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.
- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

4.1 Goals

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

This planning effort is an update to Howell County's existing hazard mitigation plan approved by FEMA during the summer of 2017. Therefore, the goals from the 2017 Howell County Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. During planning meetings, MPC members and local stakeholders held a discussion in order to review and update the plan goals.

To ensure that the goals developed for this update were comprehensive and supported State goals, the 2018 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans.

Goal 1: Protect the Lives and Property of all Citizens of Howell County

- Identify and provide sufficient emergency shelters.
- Review and maintain current warning systems for sufficient coverage.

Goal 2: Preserve the Functioning of Civil Government During Natural Disasters

- Implement proper maintenance and necessary upgrades of critical buildings and infrastructures in the county.
- Improve the efficiency, timing, and effectiveness of response and recovery efforts for natural hazard disasters.

Goal 3: Maintain Economic Activities Essential to the Survival and Recovery from Natural Disasters

- Periodically review chain of command of government organizations for emergency situations and keep up-to-date.
- Continuously review communications systems and keep in good working order.

4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

During the hazard mitigation planning meetings in the county and at the final MPC work session, the results of the risk assessment update were provided to the participants for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. The meetings concluded with the distribution of a list of possible mitigation actions submit to the MPC for their review and approval. The list included possible new mitigation actions, as well as actions from the previously approved plan that were candidates for removal, due to the nature of them not being measurable or fundable. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. SCOCOG planners discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

The focus of the MPC work session then shifted to development the mitigation strategy. For a comprehensive range of mitigation actions to consider, the SCOCOG planners provided information to the MPC reviewing the following information:

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties;
- Key issues from the risk assessment and vulnerability analysis;
- State priorities established for Hazard Mitigation Assistance grants, and
- Public input via the online survey tool, and other efforts to involve the public in the plan development process.

Table 4.1 consists of a summary of the hazard mitigation actions listed within this update of the county hazard mitigation plan, by participating jurisdiction:

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Continuing Actions (ongoing or modify)	Deleted Actions
Howell County	0	4	0
City of Brandsville	1	1	0
City of Mountain View	0	2	0
City of West Plains	0	7	0
City of Willow Springs	0	6	0
Fairview R-XI	1	1	0
Glenwood R-VIII	1	2	0
Howell Valley R-I	0	2	0
Junction Hill C-12	0	1	0
MSU—West Plains	1	2	0
Richards R-V	1	1	0
West Plains R-VII	1	4	0
Willow Springs R-IV	1	1	0

Table 4.2 provides a summary of the completed and deleted actions from the previous plan. The 2017 Plan had a series of county-wide mitigation actions that address five mitigation goals. Based on the status updates, there were three (3) completed actions, zero deleted actions, and 34 continuing actions.

Table 4.2. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	Completion Details (date, amount, funding source)
Construct a 361-design tornado saferoom on the South Fork Elementary campus	Project was funded by FEMA HMGP and construction was completed during the summer of 2019
Construct a new fire station in a location that is outside the FEMA SFHA	Project was funded by CDBG, and construction was completed in the Fall of 2020
Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs	Completed at a region-wide training event, 2019. Participants included: MSU-WP, Fairview, Glenwood, Willow Springs and Richards School Districts
Deleted Actions	**Reason For Deletion**
None	N/A

Source: Previously approved County Hazard Mitigation Plan; Data Collection Questionnaires.

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

A cost benefit review of all new and continuing actions in the finalized plan was conducted during the MPC work session. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis, and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the following questions and ensuing discussion:

Definitely "YES"	Maybe "YES"	Probably "NO"	Definitely "NO"
3 points	2 points	1 point	Zero points

S	Is the action *socially* acceptable?
T	Is the action *technically feasible* and potentially successful?
A	Does the jurisdiction have the *administrative capability* to successfully implement this action?
P	Is the action *politically* acceptable?
L	Does the jurisdiction have the *legal authority* to implement the action?
E	Is the action *economically beneficial*?
E	Will the project have an *environmental impact* that is either beneficial or neutral? (score "3" if positive and "2" if neutral)

The resulting list of actions were summed and divided into classes and labeled as high, medium, or low priorities. The result of the STAPLEE analysis is found in the forthcoming mitigation action worksheets.

Figure 4.1. Blank STAPLEE Worksheet

XXXXXX COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	**Jurisdiction:**
Action ID:	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): _____

In addition to the STAPLEE cost benefit review prioritization at the final MPC meeting, an implementation plan for each action was discussed. An action worksheet was used to development the implementation plan. The action worksheets are presented on the following pages.

MITIGATION ACTIONS

Goal 1: Protect the Lives and Property of all Citizens of Howell County

Mitigation Action Worksheet	
Name of Jurisdiction:	Howell County
Risk / Vulnerability	
Problem being Mitigated:	Low Water Crossing Safety
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	**Howell1**
Name of Action or Project:	Low Water Crossing Safety
Action or Project Description:	Make improvements at various low water crossings throughout the county where incidents of flash flooding become hazardous. Improvements could include barricades, warning lights, or crossing replacement
Applicable Goal Statement:	Goal 1
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Alleviate the roadway flooding that inundates the site(s) and the resulting hazardous situation
Plan for Implementation	
Responsible Organization/Department:	County
Action/Project Priority:	20 - HIGH
Timeline for Completion:	More than 5 years
MoDOT, FEMA	Local, MoDOT, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Howell County
Risk / Vulnerability	
Problem being Mitigated:	The lack of knowledge of the location of vulnerable populations in the county
Hazard(s) Addressed:	All natural hazards
Action or Project	
Action/Project Number:	**Howell3**
Name of Action or Project:	Vulnerable Population ID
Action or Project Description:	Create a better methodology for identifying, locating, and supporting vulnerable populations in the county in the event of disaster
Applicable Goal Statement:	Goal 1
Estimated Cost:	$10,000 to $50,000
Benefits:	Provide efficient response for the county's population in the event of a disaster
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management
Action/Project Priority:	17 - MED
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe shelter during severe weather for a population center
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	2017E
Name of Action or Project:	Southern Hills Saferoom
Action or Project Description:	Construct a 361 design tornado saferoom in the Southern Hills Shopping District
Applicable Goal Statement:	**Goal 1**
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Protect the lives of the general populace utilizing the shopping district
Plan for Implementation	
Responsible Organization/Department:	City; N.I.D. Board
Action/Project Priority:	19 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	Many flood-vulnerable structures throughout the city
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2017D
Name of Action or Project:	Property Buyout
Action or Project Description:	Buy out flood prone properties in the city to reduce the devastating impacts of flash flooding
Applicable Goal Statement:	**Goal 1**
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Protect the lives and property of the general populace
Plan for Implementation	
Responsible Organization/Department:	City Staff
Action/Project Priority:	21 - HIGH
Timeline for Completion:	2-5 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	Damaged flood waters in the city, primarily from Howell Creek, Burton Creek, Galloway Creek and their tributaries
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2017F
Name of Action or Project:	Stormwater Infrastructure
Action or Project Description:	Implement the local stormwater management plan which identifies the construction of flood control infrastructure such as retention basins in the City
Applicable Goal Statement:	**Goal 1**
Estimated Cost:	$1,000,000 to $3,000,000
Benefits:	Protect the lives and property of the general populace
Plan for Implementation	
Responsible Organization/Department:	City Staff
Action/Project Priority:	21 - HIGH
Timeline for Completion:	2-5 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Willow Springs
Risk / Vulnerability	
Problem being Mitigated:	The threat to human life resulting from tornadic storms in and around Willow Springs, Missouri
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	Willow3
Name of Action or Project:	South Junction Sirens
Action or Project Description:	Purchase and install outdoor warning sirens in the area of the south junction/industrial park
Applicable Goal Statement:	**Goal 1**
Estimated Cost:	$10,000 to $50,000
Benefits:	Protect the lives of the citizenry located in this specific area
Plan for Implementation	
Responsible Organization/Department:	City Public Works
Action/Project Priority:	16 - MED
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment, HMP
Progress Report	
Action Status	ONGOING
Report of Progress	**FUNDED**

Mitigation Action Worksheet	
Name of Jurisdiction:	Missouri State University-West Plains
Risk / Vulnerability	
Problem being Mitigated:	The lack of defined shelter areas in the rural Ozarks
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	MSU1
Name of Action or Project:	Mass Care Sheltering
Action or Project Description:	Work with city and county emergency management agencies and the local Red Cross to establish strategies for short term mass-care sheltering utilizing available university facilities
Applicable Goal Statement:	Goal 1
Estimated Cost:	Little or no cost
Benefits:	Identification of usable facilities for mass care operations
Plan for Implementation	
Responsible Organization/Department:	University
Action/Project Priority:	17 - MED
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Missouri State University-West Plains
Risk / Vulnerability	
Problem being Mitigated:	Flooding at University Owned Properties
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	MSU3
Name of Action or Project:	Flood Mitigation
Action or Project Description:	Implement stream bank channelization flood protections measures near the Shoe Loft Dormitory, Greater Ozarks Center For Advanced Manufacturing Training, and other flood-prone sites, by improving the stormwater control within the Howell Creek basin in downtown West Plains
Applicable Goal Statement:	Goal 1
Estimated Cost:	$1,000,000-$3,000,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	University
Action/Project Priority:	20 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local/FEMA/CDBG
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Junction Hill School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of available safe room for shelter from Tornadic storms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	JunctionHill1
Name of Action or Project:	Tornado Safe Room
Action or Project Description:	Construct a 361 design tornado saferoom on the school campus
Applicable Goal Statement:	Goal 1
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Protect the lives of the students and local citizens
Plan for Implementation	
Responsible Organization/Department:	Superintendent's Office
Action/Project Priority:	21 - HIGH
Timeline for Completion:	3-5 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	West Plains School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of available safe room for shelter from Tornadic storms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	WPelem1
Name of Action or Project:	Tornado Safe Room
Action or Project Description:	Construct a 361 design tornado saferoom on the WP Elementary campus
Applicable Goal Statement:	Goal 1
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Protect the lives of the students and local citizens
Plan for Implementation	
Responsible Organization/Department:	Superintendent's Office
Action/Project Priority:	21 - HIGH
Timeline for Completion:	3-5 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	NEW
Report of Progress	**FUNDED**

Mitigation Action Worksheet	
Name of Jurisdiction:	Willow Springs School District
Risk / Vulnerability	
Problem being Mitigated:	The lack of defined shelter areas in the rural Ozarks
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	WillowSchool2
Name of Action or Project:	Mass Care Sheltering
Action or Project Description:	Work with city and county emergency management agencies and the local Red Cross to establish strategies for short term mass-care sheltering utilizing available school facilities
Applicable Goal Statement:	Goal 1
Estimated Cost:	Little or no cost
Benefits:	Identification of usable facilities for mass care operations
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	14 - LOW
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Goal 2: Preserve the Functioning of Civil Government During Natural Disasters

Mitigation Action Worksheet	
Name of Jurisdiction:	Howell County
Risk / Vulnerability	
Problem being Mitigated:	Minimal/ineffective warning for severe weather events
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Howell2
Name of Action or Project:	Improved Warning
Action or Project Description:	Make general improvements to the existing framework for notification of severe weather events, primarily tornadic storms. Explore new avenues to disseminate warnings
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000 to $50,000
Benefits:	Protect the lives of the citizenry
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management
Action/Project Priority:	18 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA, RHSOC
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Brandsville
Risk / Vulnerability	
Problem being Mitigated:	The Brandsville Volunteer Fire Department Station is currently located within the FEMA special flood hazard area
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	Brandsville1
Name of Action or Project:	New Fire Station
Action or Project Description:	Construct a new fire station in a location that is outside the FEMA SFHA
Applicable Goal Statement:	Goal 2
Estimated Cost:	$100,000 to $500,000
Benefits:	Ensure adequate response times during times of flooding
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	20 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	CDBG
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan; CEDS
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Brandsville
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	Brandsville3
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase back up power generator for installation at the city's only water well
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	City - Mayor
Action/Project Priority:	21 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	NEW
Report of Progress	NEW

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Mountain View
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	MV2022
Name of Action or Project:	Back-up Generators
Action or Project Description:	Purchase back up power generators for installation at the city's police department (EOC), municipal water well and wastewater treatment facility
Applicable Goal Statement:	Goal 2
Estimated Cost:	$100,000-$200,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	City - Mayor
Action/Project Priority:	20 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	NEW
Report of Progress	NEW

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	The city is 'cut in half' by the Burlington Northern-Santa Fe Railroad
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	2017C
Name of Action or Project:	Independence Drive Overpass
Action or Project Description:	Construct a railroad overpass on Independence Dr. (US160) to ensure proper emergency access in the event of a disaster
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000,000
Benefits:	Ensure adequate response times during times of disaster
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	17 - MED
Timeline for Completion:	3-5 years
Potential Fund Sources:	Local, BNSF, MoDOT, USDOT
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	**FUNDED**

Mitigation Action Worksheet	
Name of Jurisdiction:	Missouri State University-West Plains
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	MSU2
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	University Director of Development
Action/Project Priority:	14 - LOW
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	Fairview School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Fairview1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	18 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	Fairview School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	Fairview2
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a backup power generator for use at the school, in the event of power outage
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	19 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Glenwood School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	Glenwood3
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a backup power generator for use at the school, in the event of power outage
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	20 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	NEW
Report of Progress	NEW

Mitigation Action Worksheet	
Name of Jurisdiction:	Glenwood School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Glenwood1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	16 - MED
Timeline for Completion:	1 year
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	Glenwood School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Glenwood2
Name of Action or Project:	Communications
Action or Project Description:	Improve the capabilities of the school district to engage in interoperable communications in the area to mitigate the vulnerability of the school district's students and staff
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	19 – HIGH
Timeline for Completion:	1 year
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Howell Valley School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	HowellValley1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	19 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Howell Valley School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	HowellValley2
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a backup power generator for use at the school, in the event of power outage
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	19 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Richards School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Richards1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	17 - MED
Timeline for Completion:	3-5 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	Richards School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	Richards2
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a backup power generator for use at the school, in the event of power outage
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	15 - Medium
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	West Plains School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	WPschool1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	17 - MED
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	West Plains School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	WPschool4
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a more powerful and reliable generator
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	16 - Medium
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Willow Springs School District
Risk / Vulnerability	
Problem being Mitigated:	Improve communication of local jurisdiction with emergency management agencies
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	WillowSchool1
Name of Action or Project:	NIMS Training
Action or Project Description:	Encourage school officials to participate in National Incident Management System (NIMS) training and compliance programs
Applicable Goal Statement:	Goal 2
Estimated Cost:	Little or no cost
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	COMPLETE
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	**COMPLETE**
Report of Progress	**COMPLETE**

Mitigation Action Worksheet	
Name of Jurisdiction:	Willow Springs School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient and unreliable equipment to deal with loss of power
Hazard(s) Addressed:	Severe T-Storm; Ice Storm; Tornado
Action or Project	
Action/Project Number:	WillowSchool4
Name of Action or Project:	Back-up Generator
Action or Project Description:	Purchase a backup power generator for use at the school, in the event of power outage
Applicable Goal Statement:	Goal 2
Estimated Cost:	$10,000-$20,000
Benefits:	Community Resilience
Plan for Implementation	
Responsible Organization/Department:	Superintendent Office
Action/Project Priority:	19 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	NEW
Report of Progress	NEW

Goal 3: Maintain Economic Activities Essential to the Survival and Recovery from Natural Disasters

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Mountain View
Risk / Vulnerability	
Problem being Mitigated:	The threat of flooding to the built environment
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	**MountainView2022-A**
Name of Action or Project:	NFIP
Action or Project Description:	The city will attempt to improve floodplain management by identification of map amendments/updates
Applicable Goal Statement:	Goal 3
Estimated Cost:	Little or no cost
Benefits:	Improve the delivery of floodplain management services
Plan for Implementation	
Responsible Organization/Department:	City's Floodplain Administrator
Action/Project Priority:	16 – LOW
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	Electric distribution network is vulnerable to natural hazards
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	2017G
Name of Action or Project:	Bury Power Lines
Action or Project Description:	Bury power lines throughout the city to protect vulnerable populations and critical facilities from loss of power/operations
Applicable Goal Statement:	Goal 3
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Mitigate the effects of power loss on vulnerable populations and at critical facilities
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	15-LOW
Timeline for Completion:	3-5 years
Potential Fund Sources:	Local, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Comprehensive City Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of West Plains
Risk / Vulnerability	
Problem being Mitigated:	The threat of flooding to the built environment
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	2022A
Name of Action or Project:	NFIP
Action or Project Description:	The city will attempt to improve floodplain management by identification of map amendments/updates
Applicable Goal Statement:	Goal 3
Estimated Cost:	Little or no cost
Benefits:	Improve the delivery of floodplain management services
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator
Action/Project Priority:	15-LOW
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Willow Springs
Risk / Vulnerability	
Problem being Mitigated:	Roadway Flooding
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	Willow1
Name of Action or Project:	Welch Drive Elevation
Action or Project Description:	Elevate Welch Drive west of the new bridge constructed in 2012
Applicable Goal Statement:	Goal 3
Estimated Cost:	$500,000 to $1,000,000
Benefits:	Mitigate the effects of flash flooding on the road infrastructure and minimize travel impacts
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	21 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	CDBG, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Willow Springs
Risk / Vulnerability	
Problem being Mitigated:	Lack of back-up power source at the city's emergency operations center
Hazard(s) Addressed:	Various
Action or Project	
Action/Project Number:	Willow2
Name of Action or Project:	EOC Backup
Action or Project Description:	Purchase and install a backup generator at the emergency operations center
Applicable Goal Statement:	Goal 3
Estimated Cost:	$10,000 to $50,000
Benefits:	Ensure the continued operations of the critical facility to minimize the impacts of natural disasters
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	18 - HIGH
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local, CDBG, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Threat Hazard Identification Risk Assessment
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Willow Springs
Risk / Vulnerability	
Problem being Mitigated:	The threat of flooding to the built environment
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	Willow4
Name of Action or Project:	Springfield Road Flooding
Action or Project Description:	Elevate the roadway from West Street to the Catholic Church, or construct other flood mitigation measures to limit the impacts of flash flooding
Applicable Goal Statement:	Goal 3
Estimated Cost:	$100,000 to $500,000
Benefits:	Mitigate the effects of flash flooding on the road infrastructure and minimize travel impacts
Plan for Implementation	
Responsible Organization/Department:	City
Action/Project Priority:	15 - LOW
Timeline for Completion:	3-5 years
Potential Fund Sources:	CDBG, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	City of Willow Springs
Risk / Vulnerability	
Problem being Mitigated:	The threat of flooding to the built environment
Hazard(s) Addressed:	Flooding (Flash and River)
Action or Project	
Action/Project Number:	**WillowSprings5**
Name of Action or Project:	NFIP
Action or Project Description:	The city will attempt to improve floodplain management by identification of map amendments/updates
Applicable Goal Statement:	Goal 3
Estimated Cost:	Little or no cost
Benefits:	Improve the delivery of floodplain management services
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator
Action/Project Priority:	15 – LOW
Timeline for Completion:	2-3 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status	ONGOING
Report of Progress	ONGOING

Mitigation Action Worksheet	
Name of Jurisdiction:	Countywide
Risk / Vulnerability	
Problem being Mitigated:	The failure and increasing vulnerability of aging infrastructure and community failures
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	**Howell4**
Name of Action or Project:	Asset Management
Action or Project Description:	Continuously identify funding sources to update buildings and infrastructure to ensure that community assets are resilient to natural disaster
Applicable Goal Statement:	Goal 3
Estimated Cost:	Little or no cost
Benefits:	Ensure that the local governments are aware of the resources available to them
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management Regional Planning Commission
Action/Project Priority:	15 - LOW
Timeline for Completion:	Less than one year
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	Comprehensive Economic Development Strategy
Progress Report	
Action Status	Continue In-Progress
Report of Progress	Local jurisdictions are continuously kept up to date by SCOCOG staff on hazard mitigation funding availability

5 PLAN MAINTENANCE PROCESS

This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan in existing planning mechanisms and how to address continued public involvement.

5.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

5.1.1 Responsibility for Plan Maintenance

The MPC is not a standing committee, with oversight by a responsible agency or elected body. The MPC representatives and stakeholders are represented on the Local Emergency Planning Committee (LEPC) in Howell County and the Regional Homeland Security Oversight Committee (RHSOC). The LEPC is responsible for developing and implementing the Local Emergency Operations Plan and is a standing committee that meets regularly and is administered through the Howell County Emergency Management agency. The RHSOC is responsible for developing and implementing the Threat Hazard Identification Risk Assessment for the region, including Howell County. The goals and actions and representation are aligned with the missions of the RHSOC, which is a standing committee. As such, the RHSOC will be responsible for plan monitoring, evaluation and maintenance.

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters.
- Report on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The RHSOC is an advisory body only and can only make recommendations to local jurisdictions. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

5.1.2 Plan Maintenance Schedule

The RHSOC agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor the progress and update the mitigation strategy. The Howell County Emergency Management Director, who also serves on the RHSOC, will be responsible for initiating the plan reviews and will invite members of the Howell County contingent to the RHSOC meeting.

In coordination with all participating jurisdictions, a five-year written update of the plan will be submitted to the Missouri State Emergency Management Agency (SEMA) and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The RHSCOC during the annual meeting should review changes in vulnerability identified as follows:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions,
- Increased vulnerability due to hazard events, and/or
- Increased vulnerability as a result of new development (and/or annexations).

Future 5-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation,
- Documentation of success stories where mitigation efforts have proven effective,
- Documentation of unsuccessful mitigation actions and why the actions were not effective,
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval,
- Incorporation of new data or studies with information on hazard risks,
- Incorporation of new capabilities or changes in capabilities,
- Incorporation of growth data and changes to inventories, and
- Incorporation of ideas for new actions and changes in action prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the participating jurisdictions will adopt the following process:

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to the jurisdictional RHSOC member on action status. The entity will provide input on whether the action as implemented

meets the defined objectives and is likely to be successful in reducing risk.

- If the action does not meet identified objectives, the jurisdictional RHSOC member will determine necessary remedial action, making any required modifications to the plan.

Changes will be made to the plan to remedy actions that have failed or are not considered feasible. Feasibility will be determined after a review of action consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring of this plan. Updating of the plan will be accomplished by written changes and submissions, as the R H S OC deems appropriate and necessary. Changes will be approved by the Howell County Commission and the governing boards of the other participating jurisdictions.

5.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in the *Community Profiles and Capabilities* chapter of this plan. Based on the capability assessments of the participating jurisdictions, communities in Howell County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- Comprehensive or land use plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Howell County Emergency Operations Plan;
- South Central Ozark Regional Transportation Plan;
- Capital Improvement Plans and budgets;
- Schools and Special District Plans and budgets, and;
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of the plan.

The RHSOC members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The RHSOC is also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, the Regional Hazard Mitigation Planner housed at the South Central Ozark Council of Governments will provide the updated mitigation strategy with current status of each mitigation action to the County Commission as well as all mayors, city clerks, and school superintendents. The Hazard Mitigation Planner will request that the mitigation strategy be incorporated, where appropriate, into other planning mechanisms.

Table 5.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms	Integration Process for Previous Plan	Integration Process for Current Plan
Howell County Commission	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Brandsville	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Mountain View	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
West Plains	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.

Willow Springs	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Fairview R-XI	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Glenwood R-VIII	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Howell Valley R-I	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Junction Hill C-12	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Richards R-V	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
West Plains R-VII	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Willow Springs R-IV	Howell County Emergency Operations Plan (EOP)	The county Emergency Management Director participated in planning meetings	EMD meeting participation, the County's EOP references the HMP for a resource for data, mitigation actions and mapping.
Howell County Commission	South Central Ozark Regional Transportation Plan (RTP)	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.
Brandsville	South Central Ozark Regional Transportation Plan (RTP)	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.

Mountain View	South Central Ozark Regional Transportation Plan (RTP)	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.
West Plains	South Central Ozark Regional Transportation Plan (RTP)	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.
Willow Springs	South Central Ozark Regional Transportation Plan (RTP)	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.	The local planning process involves prioritization of transportation projects and defining broad transportation improvement strategies, including hazard mitigation (primarily roadway flooding and dangerous low-water crossings, economic development, safety, and expansion of multimodal opportunities.
Howell County Commission	Comprehensive Economic Development Strategy (CEDS)	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items
Brandsville	Comprehensive Economic Development Strategy (CEDS)	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items
Mountain View	Comprehensive Economic Development Strategy (CEDS)	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items
West Plains	Comprehensive Economic Development Strategy (CEDS)	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items
Willow Springs	Comprehensive Economic Development Strategy (CEDS)	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items	Many of the mitigation actions identified in the HMP are also listed in the CEDS as actions items

5.3 Continued Public Involvement

44 CFR 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 hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper as well as on the South Central Ozark Council of Governments website following each annual review of the mitigation plan. When the Mitigation Planning Committee reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort, to update and revise the plan. Public notice will be posted, and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.

Appendix A – Planning Participation Documentation

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

County: Howell _____

Jurisdiction: Howell County _____

Prepared by: Mark Collins _____

Phone: 417-256-3872 _____

Email: Mark963@centurytel.net _____

Date: 4/7/2022 _____

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney _____

Address: PO BOX 100 _____

Email: tcourtney@scocog.org _____

CAPABILITY ASSESSMENT
&
INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Small Local Governments

County: HOWELL

Jurisdiction: MOUNTAIN VIEW

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Linda Higgins

Phone: _____

Email: _____

Date: 2/16/2022

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: _____

Email: TCourtney@SCOCOG.ORG

Fax: _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Small Local Governments

County: Howell

Jurisdiction: Brandsville

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Linda Burch

Phone: Mayor

Email: _____

Date: _____

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: PO Box 100

Email: TCourtney@SoCOG.org

Fax: _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Small Local Governments

County: Howell _____

Jurisdiction: Willow Springs _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Beverly Hicks _____

Phone: 417-469-2107 _____

Email: bhicks@willowspringsmo.com _____

Date: 3/28/2022 _____

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney_____

Address: PO Box 100 _____

Email: tcourtney@scocog.org _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Small Local Governments

County: Howell

Jurisdiction: The City of West Plains

Prepared by: Michael McMahon

Phone: 417-256-7170

Email: Michael.mcmahon@westplains.gov

Date: 4/5/2022

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: PO BOX 100

Email: tcourtney@scocog.org

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell

School District / Educational Institution Name: Fairview R-11

Return by: 4-30-22

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Aaron Sydow

Phone: 417-256-1063

Email: asydow@fairview.k12.mo.us

Date: 4-5-22

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: PO Box 100 Pomona

Email: tcourtney@scogg.org

Fax: Phone: (417) 256-4226

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell _____

School District /
Educational Institution Name: Junction Hill _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by:John Dern _____

Phone: (417) 256-4265 _____

Email: jdern@junctionhill.k12.mo.us _____

Date: 3/11/2022 _____

Please return questionnaires by mail, email, or fax to:

Name:Trent Courtney _____

Address: PO Box 100 Pomona, Missouri _____

Email: tcourtney@scocog.org _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell

School District /
Educational Institution Name: Glenwood R-8 School District

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Lucas Brown

Phone: 417-256-4849

Email: lbrown@glenwood.k12.mo.us

Date: 04/042022

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: PO BOX 100 Pomona, Missouri, 65789

Email : tcourtney@scocog.org

Phone: 417-256-4226

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell

School District /
Educational Institution Name: Howell Valley R-I School District

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Marvin Hatley

Phone: 417-256-2268

Email: mhatley@hvpanthers.org

Date: 3/4/2022

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney

Address: 4407 County Road 2340 – PO Box 100, Pomona, MO 65789

Email: tcourtney@scocog.org

Fax: _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell _____

School District /
Educational Institution Name: Richard R-5 _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Melonie Bunn _____

Phone: 417-256-5239 _____

Email: mbunn@richardsschool.k12.mo.us _____

Date: 4/13/2022 _____

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney _____

Address: PO BOX 100 _____

Email: tcourtney@scocog.org _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell _____

School District /
Educational Institution Name: Willow Springs R-IV _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: William Hall _____

Phone: 417-469-3260 _____

Email: hallb@wspgs.com _____

Date: 4/13/2022 _____

Please return questionnaires by mail, email, or fax to:

Name: Trent Courtney _____

Address: PO BOX 100 _____

Email: tcourtney@scocog.org _____

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Howell

School District / Educational Institution Name: West Plains R-VII

Return by:

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Wesley Davis

Phone: 417-256-6155

Email: Wesley.davis@zizzers.org

Date: 4/15/22

Please return questionnaires by mail, email, or fax to:

Name:

Address:

Email:

Fax:

Sign in Sheets ~~HMGP~~ 5 Year Update 4-7-22

* Trent Courtney SCOCOG

Billy [illegible] Southern Commissioner

Burt H Campbell Sheriff

Kelly Waggoner Howell County Clerk

[illegible] Norman Commissioner

[illegible] PRESIDING COMMISSIONER

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	4/15/22
Facilitator:	Trent Courtney	**Place/Room:**	~~Post~~ office Branchville

Name	Occupation/Affiliation	Phone	E-Mail
[illegible]	Mayor		[illegible]49@Icloud.com
Trent Courtney	SCOCOG		tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	2 · 16 · 22
Facilitator:	Trent Courtney	**Place/Room:**	MTN View

Name	Occupation/Affiliation	Phone	E-Mail
Sandy Riggs	FINANCIAL OFFICER	417 934 2601	MVcitymayor@centurytel.net
Trent Courtney	SCOCOG	417 256-4226	tcourtney@scocog.occ

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	4/4/2022
Facilitator:	Trent Courtney	**Place/Room:**	City Hall - WP

Name	Occupation/Affiliation	Phone	E-Mail
Evan Kinder	SR Planning Tech	417-256-7174	evan.kinder@westplains.gov
Dustin Harrison	Building Official Zoning Administrator	417-256-7176	dustin.harrison@westplains.gov
MICHAEL MCMAHON	Project / GRANT SPECIALIST	417-256-7176	MICHAEL.MCMAHON@WESTPLAINS.GOV

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/25/2022
Facilitator:	Trent Courtney	**Place/Room:**	Willow Springs

Name	Occupation/Affiliation	Phone	E-Mail
Heather Duddridge	City Clerk	417-469-2107	hduddridge@willowspringsmo.com
Beverly Hicks	City Administrator	417-469-2107	bhicks@willowspringsmo.com
Trent Courtney	SCOCOG	256 4226	tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/7/2022
Facilitator:	Trent Courtney	**Place/Room:**	Fairview Schools

Name	Occupation/Affiliation	Phone	E-Mail
Aaron Sydow	Fairview R11 SD	417-256-1063	asydow@fairview.k12.mo.us
Trent Courtney	SCOCOG	417 256 4281	TCourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/2/2022
Facilitator:	Trent Courtney	**Place/Room:**	Glenwood School

Name	Occupation/Affiliation	Phone	E-Mail
Lucas Brown	Principal, Glenwood School	417-256-4849	lbrown@glenwood.k12.mo.us
Wayne Stewart	Superintendent, Glenwood School	417-256-4849	wstewart@glenwood.k12.mo.us
Trent Courtney	SCOCOG	4172564776	tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/25/2022
Facilitator:	Trent Courtney	**Place/Room:**	Howell Valley school

Name	Occupation/Affiliation	Phone	E-Mail
M. Hatley	Superintendent	256 * 2268	mhatley@hvpanthers.org
Trent Courtney	ScoCOG	256 4226	tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY			
Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/24/22
Facilitator:	Trent Courtney	**Place/Room:**	Junction Hill Schools

Name	Occupation/Affiliation	Phone	E-Mail
John R. Dern	Superintendent Junction Hill C-12 School	417-256-4265	jdern@junctionhill.k12.mo.us
Trent Courtney	SCOCOG	417-256-4226	tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/7/22
Facilitator:	Trent Courtney	**Place/Room:**	RICHARDS school

Name	Occupation/Affiliation	Phone	E-Mail
Melanie Bunn	Superintendent	(417) 256-5239	mbunn@richardsschool.K12.mo.us
Trent Courtney	SCOCOG	417.252.4116	tcourtney@SCOCOG.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY			
Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	
Facilitator:	Trent Courtney	**Place/Room:**	

Name	Occupation/Affiliation	Phone	E-Mail
Lori Wilson	Superintendent	417-256-6155	lori.wilson@zizzers.org
Wes Davis	Assistant Sup	417-256-6155	Wesley.davis@zizzers.org
Trent Courtney	SCOCOG	417-254-4226	tcourtney@scocog.org

MEETING SIGN-IN SHEET PLEASE PRINT CLEARLY

Project:	Hazard Mitigation Planning – 5 year update	**Meeting Date:**	3/1/22
Facilitator:	Trent Courtney	**Place/Room:**	Willow Springs - School

Name	Occupation/Affiliation	Phone	E-Mail
William Hall	Superintendent	(417)469-3260	hallb@wspgs.com
Trent Courtney	SLOCOG	417-256-4226	tcourtney@slocog.org

Appendix B – Completed & Deleted Mitigation Actions

Completed Actions	Completion Details
Construct a 361 design tornado sa eroo on the South ork le entary ca pus	Pro ect as unded y MA HM P and construction as co pleted during the su er o 2019
Construct a ne ire station in a location that is outside the MA S HA	Pro ect as unded y CDB and construction as co pleted in the all o 2020
ncourage school o icials to participate in ational ncident Manage ent Syste MS training and co pliance progra s	Co pleted at a region ide training e ent 2019. Participants included MS P air ie len ood illo Springs and ichards School Districts
Deleted Actions	**Reason for Deletion**
O	A

Appendix C – Public Engagement

AFFIDAVIT OF PUBLICATION

State of Missouri, County of Howell, ss:

I, Martha Tarver, being duly sworn according to law, state that I represent the publisher of the West Plains Daily Quill, a daily newspaper of general circulation in the County of Howell, where located; which has been admitted to the Post Office as periodical matter in the City of West Plains, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with the provisions of Section 493.050 Revised Statutes of Missouri, 2000. The affixed notice appeared in said newspaper on the following consecutive dates:

From 04/08/2021 to 04/08/2021 both inclusive.

1st insertion, Vol. 118, No. 69, 04/08/2021
2nd insertion, Vol. ___, No. ___,
3rd insertion, Vol. ___, No. ___,
4th insertion, Vol. ___, No. ___,

Martha Tarver
Martha Tarver

Subscribed to and sworn to before me this 04/08/2021

DURREALL VONALLMEN
Notary Public, Notary Seal
State of Missouri
Oregon County
Commission # 19507807
My Commission Expires AUGUST 21, 2023

Durreall VonAllmen
Durreall VonAllmen, Notary

My commission expires August 21, 2023

Filed and Recorded _____

(Publication Fee, $101.00)

PUBLIC NOTICE

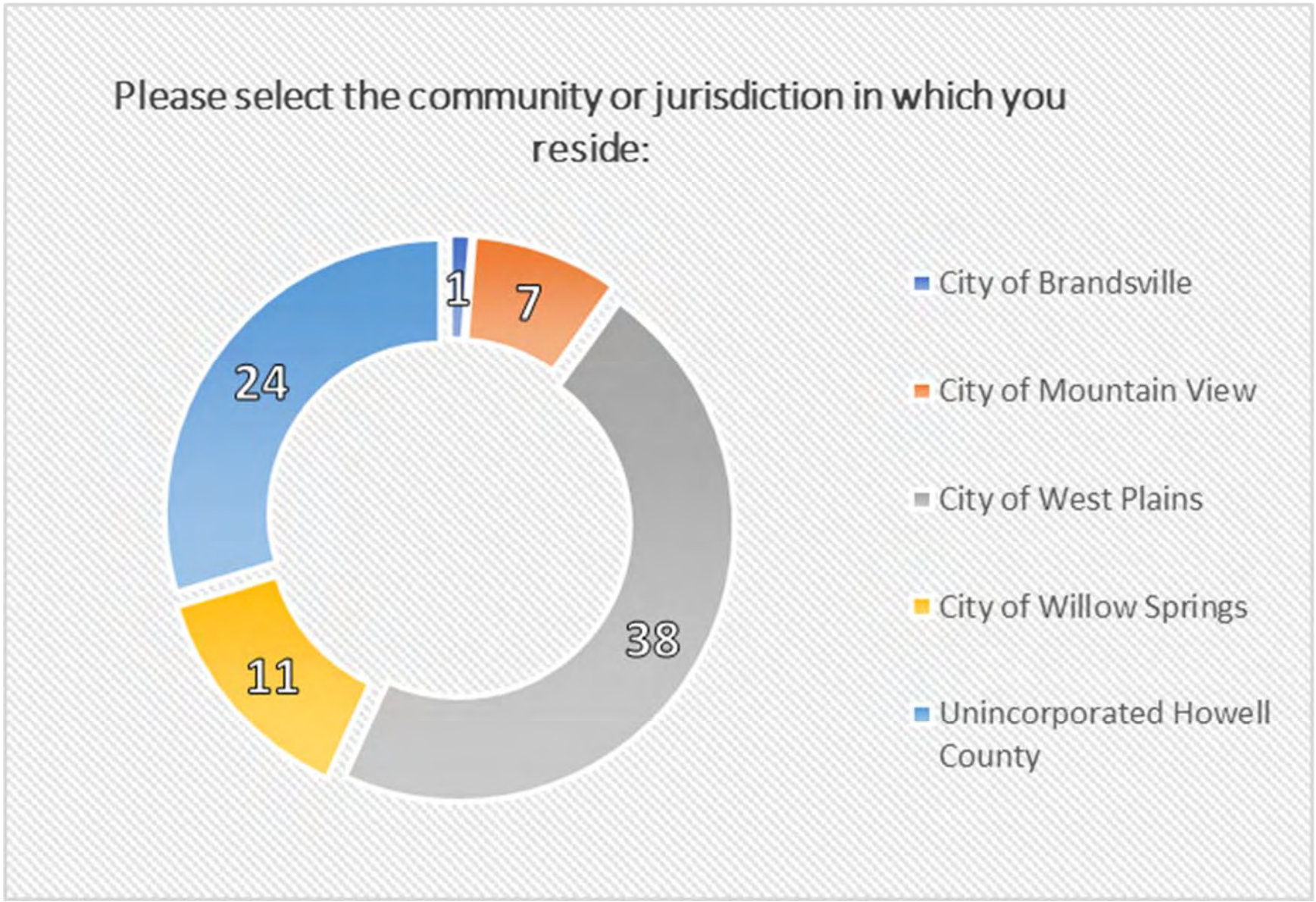
Update of the Howell County Hazard Mitigation Plan

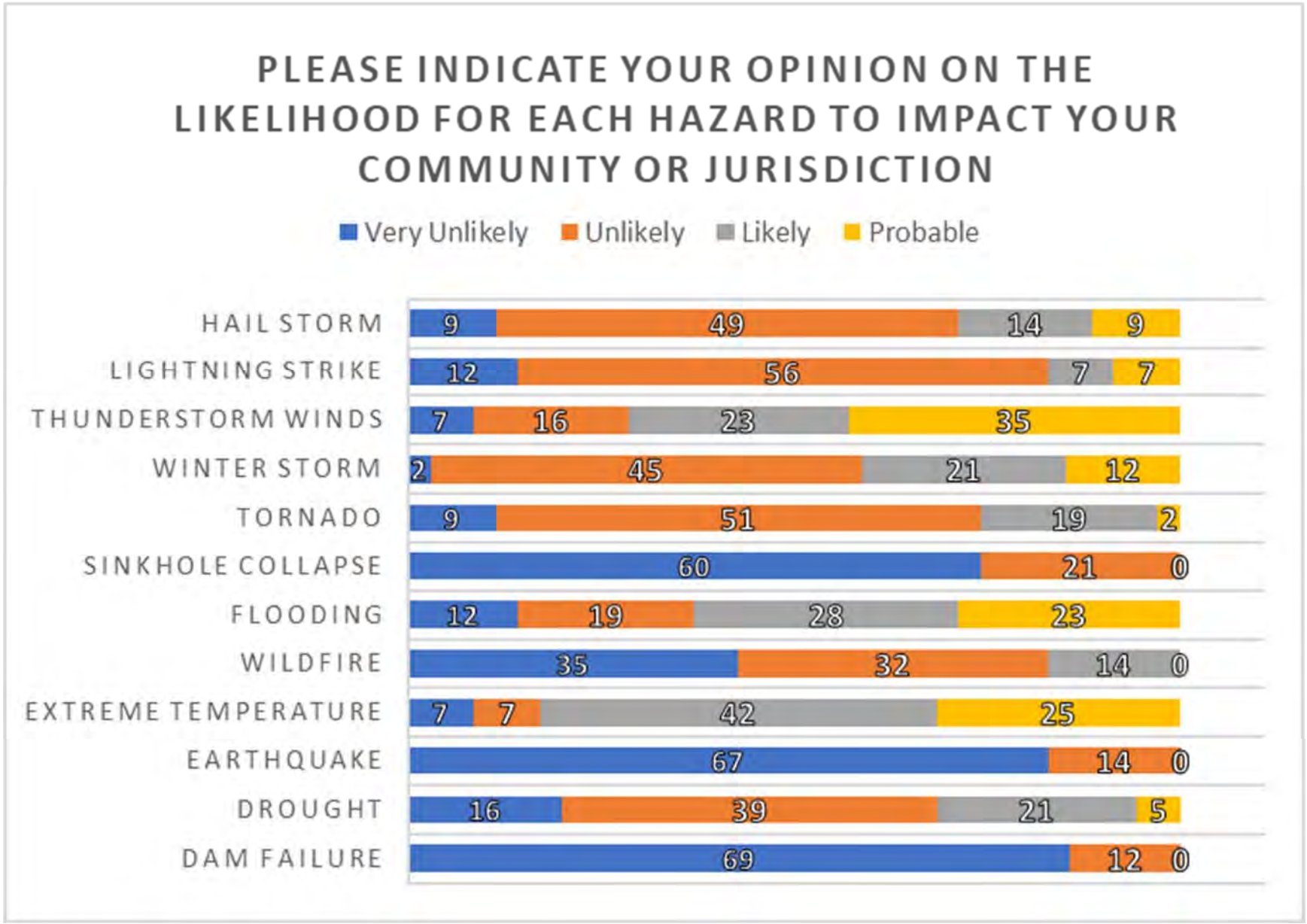
The Howell County Hazard Mitigation Plan is currently in process of its mandatory 5-year update. The purpose of Hazard Mitigation Plans are to devise and retain a strategy to reduce the impact of risks posed by disastrous natural events, such as tornados, ice storms and floods. The Plan must be updated by the county every five years and approved by the Federal Emergency Management Agency in order for the County and its municipalities & school districts to remain eligible for FEMA grant funding for current and ongoing Hazard Mitigation projects such as Tornado Safe Rooms, Flood Mitigation projects, and purchases of disaster response equipment.

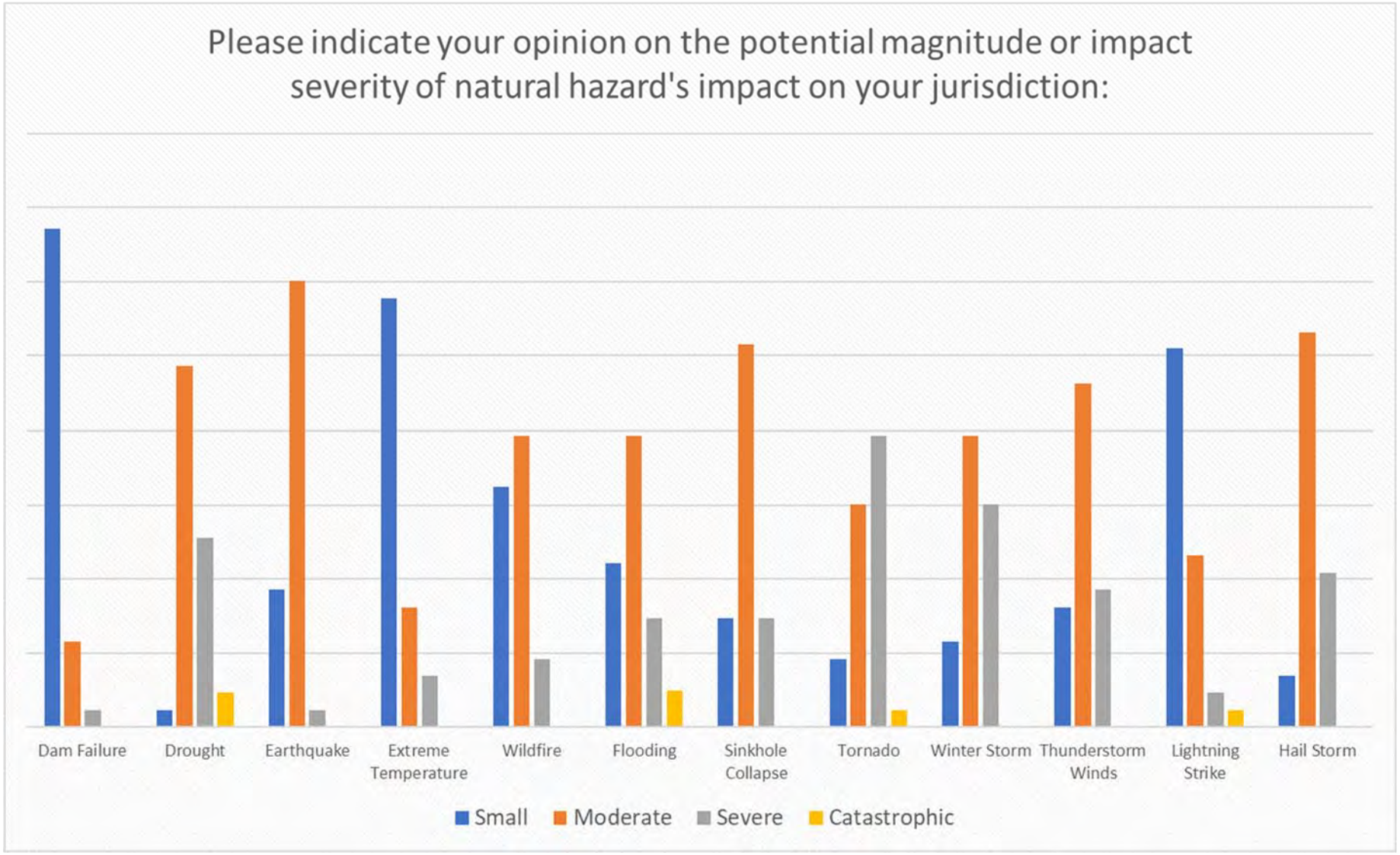
An essential part of the Hazard Mitigation planning process is to gain public input during the development of the Plan. The South Central Ozark Council of Governments has created an online survey tool to obtain input from citizens of Howell County regarding the natural hazards that threaten your county and potential solutions to address those vulnerabilities. Please navigate to the following web address and take a few minutes to respond to the survey. The survey for Howell County can be found at www.SCOCOG.org/hazard-mitigation-planning.

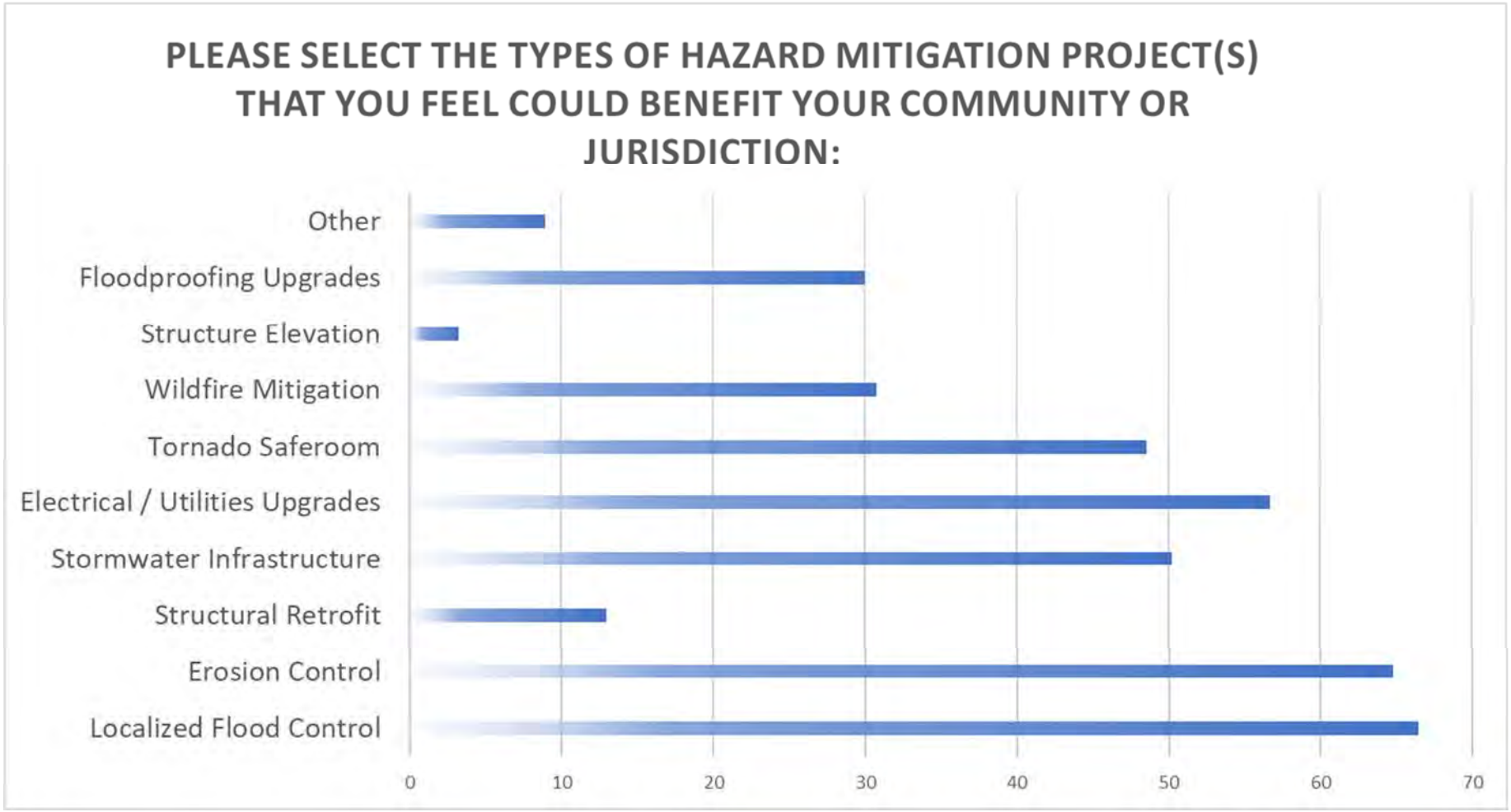
Publication Date: April 8, 2021.

ONLINE SURVEY RESULTS: 2022 Howell County Hazard Mitigation Plan




PLEASE INDICATE YOUR OPINION ON THE LIKELIHOOD FOR EACH HAZARD TO IMPACT YOUR COMMUNITY OR JURISDICTION
Very Unlikely
Unlikely
Likely
Probable
HAIL STORM
9
49
14
9
LIGHTNING STRIKE
12
56
7
7
THUNDERSTORM WINDS
7
16
23
35
WINTER STORM
2
45
21
12
TORNADO
9
51
19
2
SINKHOLE COLLAPSE
60
21
0
FLOODING
12
19
28
23
WILDFIRE
35
32
14
0
EXTREME TEMPERATURE
7
7
42
25
EARTHQUAKE
67
14
0
DROUGHT
16
39
21
5
DAM FAILURE
69
12
0


Please indicate your opinion on the potential magnitude or impact severity of natural hazard's impact on your jurisdiction:
Dam Failure
Drought
Earthquake
Extreme Temperature
Wildfire
Flooding
Sinkhole Collapse
Tornado
Winter Storm
Thunderstorm Winds
Lightning Strike
Hail Storm
Small
Moderate
Severe
Catastrophic


PLEASE SELECT THE TYPES OF HAZARD MITIGATION PROJECT(S) THAT YOU FEEL COULD BENEFIT YOUR COMMUNITY OR JURISDICTION:
Other
Floodproofing Upgrades
Structure Elevation
Wildfire Mitigation
Tornado Saferoom
Electrical / Utilities Upgrades
Stormwater Infrastructure
Structural Retrofit
Erosion Control
Localized Flood Control
0
10
20
30
40
50
60
70

DRAFT PLAN REVIEW NOTICE PUBLISHED ON 4/12/21

AFFIDAVIT OF PUBLICATION

State of Missouri, County of Howell, ss:

I, Deborah Wells, being duly sworn according to law, state that I represent the publisher of the West Plains Daily Quill, a daily newspaper of general circulation in the County of Howell, where located; which has been admitted to the Post Office as periodical matter in the City of West Plains, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bona fide subscribers voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with the provisions of Section 493.050 Revised Statutes of Missouri, 2000. The affixed notice appeared in said newspaper on the following consecutive dates:

From 04/12/2022 to 04/12/2022 both inclusive.

1st insertion, Vol. 119, No. 71, 04/12/2022
2nd insertion, Vol. ____, No. ____,
3rd insertion, Vol. ____, No. ____,
4th insertion, Vol. ____, No. ____,

Deborah Wells

Subscribed to and sworn to before me this 04/12/2022

DURREALL VONALLMEN
Notary Public, Notary Seal
State of Missouri
Oregon County
Commission # 19507807
My Commission Expires AUGUST 21, 2023

Durreall VonAllmen
Notary

My commission expires 8-21-23

Filed and Recorded _____

(Publication Fee, $90.00)

Public Notice

Notice to Public: Howell County Hazard Mitigation Plan Update
Howell County, with the assistance of the South Central Ozark Council of Governments, has finalized the 2022 update of the Multi-Jurisdictional Hazard Mitigation Plan. This plan is pursuant to Federal Emergency Management Agency's (FEMA) requirements.
A final draft of the plan is available at the SCOCOG office located at 4407 County Road 2340 Pomona, MO or at the SCOCOG website: www.SCOCOG.org. Please direct comments to: mail@scocog.org. Planning staff will be available for discussion, comments, or suggestions on or about the Hazard Mitigation Plan at the SCOCOG office Monday-Friday 8:00-4:00 until the plan is submitted to FEMA.
The purpose of the plan is to devise and retain a strategy to reduce the impact and risks posed by disastrous natural events, such as tornadoes, ice storms and floods. The plan must be updated by the County and approved by FEMA every five years in order for the County and its jurisdictions—including school districts—to remain eligible for FEMA grant funding for current and ongoing hazard mitigation projects.

Publication Date: April 12, 2022.

Appendix D – Jurisdictional Adoption Documentation

Resolution # 2022-R3

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the County of Howell recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the County of Howell fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the County of Howell desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the County of Howell demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the County of Howell has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 4-7-2022

Certifying Official: [signature]

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the City of Mountain View recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Mountain View fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the City of Mountain View desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the City of Mountain View demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the City of Mountain View has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 4/20/22

Certifying Official: _____

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the City of Brandsville recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Brandsville fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the City of Brandsville desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the City of Brandsville demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the City of Brandsville has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 4-15-2022

Certifying Official: Brenda Burnett

BILL NO. 91-22 **RESOLUTION NO. 22-91**

A RESOLUTION AUTHORIZING THE MAYOR TO ADOPT THE HOWELL COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

BE IT RESOLVED BY THE CITY OF WILLOW SPRINGS, MISSOURI AS FOLLOWS:

Whereas, the City of Willow Springs recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Willow Springs fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the City of Willow Springs desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the City of Willow Springs demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the City of Willow Springs has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan.

PASSED AND ADOPTED THIS 19th DAY OF APRIL 2022.

CITY OF WILLOW SPRINGS

Brooke Fair, Mayor

ATTEST:

Heather Duddridge, City Clerk

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Fairview R-XI School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Fairview R-XI School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Fairview R-XI School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Fairview R-XI School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Fairview R-XI School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 3/22/22

Certifying Official: Aaron Hyde

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Glenwood R-VIII School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Glenwood R-VIII School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Glenwood R-VIII School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Glenwood R-VIII School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Glenwood R-VIII School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 04/04/2022

Certifying Official: Wayne A Crisler

Resolution # 202201

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Howell Valley R-I School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Howell Valley R-I School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Howell Valley R-I School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Howell Valley R-I School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Howell Valley R-I School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: March 21, 2022

Certifying Official: M. Hatley

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Junction Hill C-12 School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Junction Hill C-12 School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Junction Hill C-12 School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Junction Hill C-12 School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Junction Hill C-12 School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 3-10-22

Certifying Official: _____

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Richards R-V School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Richards R-V School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Richards R-V School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Richards R-V School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Richards R-V School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: April 12, 2022

Certifying Official: Melonie Burns

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the West Plains R-VII School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the West Plains R-VII School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the West Plains R-VII School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the West Plains R-VII School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the West Plains R-VII School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 5-2-22

Certifying Official: Ron Nelson, Superintendent

Resolution # _____

Adopting the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Willow Springs R-IV School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Willow Springs R-IV School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the Willow Springs R-IV School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Willow Springs R-IV School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Willow Springs R-IV School District has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan

Date: 4/13/22

Certifying Official: William Hess

BILL NO. 2022-10 RESOLUTION NO. 2022-10

A RESOLUTION BY THE CITY OF WEST PLAINS ADOPTING THE HOWELL COUNTY MULTI-JURISDICITONAL LOCAL HAZARD MITIGATION PLAN.

Whereas, the City of West Plains recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of West Plains fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan, and approved it as to form and content; and

Whereas, the City of West Plains desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts *by formally adopting* the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the City of West Plains demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi- Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WEST PLAINS, MISSOURI AS FOLLOWS:

Section 1: That the City of West Plains has adopted the Howell County Multi-Jurisdictional Local Hazard Mitigation Plan as an official plan.

PASSED AND APPROVED THIS 18th DAY OF APRIL 2022.

CITY OF WEST PLAINS, MISSOURI

BY: _____
MAYOR MICHAEL TOPLIFF

ATTEST:

_____
CITY CLERK ALLISON SKINNER

WEST PLAINS
-MISSOURI-
MAKE IT HAPPEN HERE

April 7, 2022

To: Sam Anselm, City Administrator
Allison Skinner, City Clerk

From: Michael McMahon, Project/Grant Specialist

Re: Updated HMP plan

Executive Summary

The purpose of this resolution is to adopt the updated Howell County Multi-Jurisdictional Local Hazard Mitigation Plan.

Discussion

The city is working with South Central Ozark Council of Governments (SCOCOG) to update our portion and then adopt the county's 5-year Hazard Mitigation Plan. This will involve making sure the plan is up to date on city assets and with all the correct and current ordinances and policies. This plan provides information on the natural hazard risks for the county and how to mitigate those hazards in the future.

Normally the plan would be completed prior to council adoption, however in order to meet FEMA's deadline requirement we must request approval prior to SCOCOG finalizing the complete document. This is due to unforeseen changes in FEMA's protocol specifying the order of approvals. This plan is expected to only include slight revisions from the current plan approved in 2017.

The federal government requires all counties, cities, and school districts to have hazard mitigation plans approved by FEMA to be eligible for Hazard Mitigation and Flood Mitigation Assistance Grants. Howell County's current plan expires in 2022. The goal is to lessen the damages caused by natural hazards occurring in Howell County.

Fiscal Impact

This is no expected fiscal impact from adopting this plan and adopting the updated plan may help in securing emergency funding should another disaster take place.