2025 Regional Multi-hazard Mitigation Plan

For Cass, Clay, Jackson, Platte and Ray counties
and their incorporated cities in Missouri.

MARC
MID-AMERICA REGIONAL COUNCIL

STATE OF MISSOURI
EMERGENCY MANAGEMENT AGENCY

MEMC
Metropolitan Emergency Managers Committee

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FORWORD

To Residents of the Kansas City Region:

Since its beginnings in the early 1800s, the Kansas City metropolitan area has experienced the adverse effects of natural disasters. Historical records indicate that natural hazards, particularly floods and tornadoes, have had a profound effect on the region. Unfortunately, there is no way to prevent disasters from occurring. The impact of disasters, however, can be mitigated. Their effects can be lessened and losses reduced through the development and application of prudent hazard mitigation strategies and actions. In doing so, the Kansas City metropolitan area can be made to be a safer place to live, work and play.

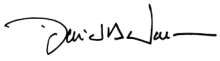
Our climate is changing, and the occurrence and intensity of natural hazard events requires that all local jurisdictions in the Kansas City region focus attention on goals and mitigation strategies.

As of November 1, 2004, all local governments and school districts must have an approved hazard mitigation plan to be eligible to apply for and receive certain FEMA funds. This FEMA program provides funds to communities to mitigate the impact of natural disasters, such as floods and tornadoes. MARC, at the request of SEMA and in partnership with the Missouri Association of Councils of Government (MACOG), has developed this *Regional Multi-Hazard Mitigation Plan* to assist the local governments, school districts, businesses, community groups and residents of Cass, Clay, Jackson, Platte and Ray counties with information on hazards posing risks to life and property, and identifies actions that could be taken to reduce the impacts from disaster events. This plan addresses priority natural hazards that have in the past and may in the future affect the Kansas City region, including tornadoes; floods and dam and levee failures; severe winter weather, drought, heat and wildland fires; and severe thunderstorms and storm winds and hail.

Hazard mitigation is a dynamic and ongoing process. This plan is a continuation of the mitigation planning work begun in 2003; it provides a framework for hazard mitigation planning, both regionally and locally. This plan will be reviewed and updated at least annually to determine the effectiveness of mitigation actions; reflect changes in laws, regulations and/or policies; re-prioritize mitigation actions, if necessary; and consider other issues affecting hazard mitigation in the Kansas City metropolitan area.

MARC, as the facilitator of this mitigation planning effort, welcomes your comments and suggestions for improving this plan. Please direct your comments and suggestions to the Mid-America Regional Council, 600 Broadway, Suite 200, Kansas City, MO 64105 or info@marc.org.

Sincerely,



David A. Warm
Executive Director

Executive Summary

The purpose of hazard mitigation is to reduce loss of life and property by lessening the impact of natural, man-made and technological disasters. Hazard mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage and reconstruction. Cass, Clay, Jackson, Platte and Ray counties and participating jurisdictions developed a *Regional Multi-Hazard Mitigation Plan* that was approved by the Federal Emergency Management Agency (FEMA) in July 2020. The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). In accordance with DMA 2000 requirements, Cass, Clay, Jackson, Platte and Ray counties and participating jurisdictions must update the plan every five years.

The *Regional Multi-Hazard Mitigation Plan* is a multi-jurisdictional plan that represents a number of local governments, school districts and other jurisdictions within the Kansas City region. The following jurisdictions participated in plan development and are represented by the plan through formal adoption:

Cass County
Belton
Harrisonville
Lake Annette
Lake Winnebago
Peculiar
Pleasant Hill
Raymore
Archie R-V School District
Harrisonville School District
Pleasant Hill R-III School District
Raymore-Peculiar School District
Sherwood-Cass R-8 School District

Clay County
Excelsior Springs
Gladstone
Kearney
Lawson
Liberty
Mosby
North Kansas City
Smithville
Excelsior Springs School District
Lawson School District
North Kansas City School District
Smithville R-II School District

Jackson County
Blue Springs
Grain Valley
Grandview
Greenwood
Independence
Kansas City, Mo.
Lee's Summit
Levasy
Oak Grove
Raytown
Central Jackson Co Fire Protection District
Sni Valley Fire Protection District
Blue Springs School District
Fort Osage R1 School District
Grain Valley School District
Independence School District
Kansas City School District
Lee's Summit R-7 School District
Oak Grove R-VI School District
Metropolitan Community Colleges

Platte County
Farley
Lake Waukomis
Northmoor
Parkville
Platte City
Platte Woods
Riverside
Tracy
Weatherby Lake
Weston
Northland Regional Ambulance District
West Platte Fire Protection District
Park Hill School District
Platte County R-3 School District
West Platte R-II School District
Park University

Ray County
Richmond
Richmond School District

The planning process followed the methodology prescribed in FEMA publications *Local Mitigation Planning Handbook* (March 2013) and *Multi-Jurisdictional Mitigation Planning* (August 2006), beginning with the formation of a Regional Multi-Hazard Mitigation Plan Steering Committee (HMSC) comprised of key stakeholders from Cass, Clay, Jackson, Platte and Ray counties and participating jurisdictions. The HMSC reviewed each section of the plan, including the planning process, risk assessment, mitigation strategy and plan maintenance. Revisions were made as appropriate to ensure the plan reflects current vulnerability within each jurisdiction.

The goals of the *Regional Multi-Hazard Mitigation Plan* are:

Prevention:

- ❑ Develop, implement and improve hazard assessment information to prevent hazards from impacting the community where possible.

Protection of Life and Property:

- ❑ Implement activities that help to protect lives and property by making homes, businesses, public and private buildings, and other structures more resistant to the effects of hazards.

Natural Resources Protection:

- ❑ Preserve, rehabilitate and restore wetlands and other natural areas to serve hazard mitigation purposes. Minimize negative effects of disasters on the environment. Integrate and coordinate hazard mitigation activities with local land use and park and open space planning.

Integration with Emergency Services:

- ❑ Enhance local and regional emergency planning, operations and training through collaboration and coordination among local, state and federal government agencies, business and industry, and community groups. Integrate and coordinate hazard mitigation activities with emergency operations plans and procedures.

Increasing Public Awareness:

- ❑ Develop and conduct public education and outreach programs to increase awareness of the risks associated with hazards in the Kansas City area.
- ❑ Provide local governments, community groups, businesses and residents with information on opportunities for partnerships, funding, tools and related mechanisms to help communities implement mitigation activities.

To meet plan goals, mitigation actions have been identified and are discussed in Section :5 Mitigation Strategy. Social, technical, administrative, political, legal, economic and environmental factors were considered when identifying and prioritizing mitigation actions. Online tools were updated as part of this plan update. Those tools will enable local jurisdictions to review their information each year and make updates to support the next plan process.

The *Regional Multi-Hazard Mitigation Plan* will be updated again in five years, by 2030.

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Chapter 1: Introduction and Planning Process

Requirement §201.6(b): *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;*
2) *An opportunity for neighboring jurisdictions, 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; and,*
3) *Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

1.1 Purpose

Cass, Clay, Jackson, Platte and Ray counties (the Missouri counties of the MARC region), along with 35 cities, 3 fire/ambulance districts, 20 school districts and 2 colleges/universities, supported this 2025 *Regional Multi-Hazard Mitigation Plan* in order to initiate and sustain actions designed to reduce or eliminate long-term risk to people and property from priority natural hazards. The planning process is as important as the plan itself and creates a framework, both locally and regionally, for the development and implementation of public policy designed to protect residents, critical infrastructure, public and private property, and the environment from the impact of hazards. This updated plan ensures the continuity of mitigation project grant funding through 2030.

1.2 Background and Scope

Hazard mitigation is defined by FEMA as any action taken to eliminate or reduce the long-term risk to human life and property from natural, man-made and technological hazards. In 2005, the National Institute of Building Science's Multi-Hazard Mitigation Council, in response to a congressional mandate, conducted an independent study on savings generated through mitigation activities. The study concluded that mitigation grant funded projects have an overall societal benefit/cost ratio of 4.0 (i.e., for every dollar spent on mitigation activities, four dollars are saved through loss avoidance).

Since the last Plan was approved in early July 2020, seven events occurred in the state of Missouri, which resulted in federal major disaster declarations and federal emergency declarations. All of the storms affecting the state involved severe storms, tornadoes and straight-line winds and flash flooding or riverine flooding. Only one of the seven impacted the 5 Missouri counties in the Kansas City region, the event DR-4612 in June 24 through July 1, 2021. Ray County was included among 21 counties. The consequences of these events have impacted residents of the region economically, socially and emotionally. As such, mitigation planning ranks among the most important initiatives the region can undertake to protect its residents and minimize property damage. While Ray County was the only metro area county impacted by these declared disasters, significant events affected lives and properties in the 5 Missouri counties over the past 5 years, including severe winter weather and extreme temperatures.

Through mitigation planning, each participating jurisdiction has identified areas throughout the region vulnerable to potential hazards and developed strategies to reduce such vulnerability. This updated hazard mitigation plan documents the progress made on established mitigation actions and proposes

new actions designed to reduce the impacts of hazards and increase resilience. The updated plan is the result of a collaborative effort by the following participating jurisdictions:

Cass County*
Belton*
Harrisonville*
Lake Annette*
Lake Winnebago*
Peculiar*
Pleasant Hill*
Raymore*
Archie R-V School District*
Harrisonville School District*
Pleasant Hill R-III School District*
Raymore-Peculiar School District*
Sherwood-Cass R-8 School District*

Clay County*
Excelsior Springs*
Gladstone*
Kearney*
Lawson*
Liberty*
North Kansas City*
Smithville*
Excelsior Springs School District*
Lawson School District*
North Kansas City School District*
Smithville R-II School District*

Jackson County*
Blue Springs*
Grandview*
Greenwood*
Grain Valley
Independence*
Kansas City, Mo.*
Lee's Summit*
Levasy
Oak Grove*
Raytown*
Central Jackson County Fire Protection District
Sni Valley Fire Protection District*
Blue Springs School District*
Fort Osage R-1 School District*
Grain Valley School District
Independence School District*
Kansas City School District*
Lee's Summit School District*
Oak Grove R-VI School District*
Metropolitan Community Colleges*

Platte County*
Farley*
Lake Waukomis*
Northmoor*
Parkville*
Platte City*
Platte Woods*
Riverside*
Tracy*
Weatherby Lake*
Weston*
Northland Regional Ambulance District*
Park Hill School District*
Platte County R-3 School District*
West Platte R-II School District*
Park University*

Ray County*
Richmond*
Richmond School District

*Denotes 2020 Participants

The updated *Regional Multi-Hazard Mitigation Plan* was prepared pursuant to the requirements of Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5165, as amended by Section 104 of the Disaster Mitigation Act of 2000, P.L. 106-390 (DMA 2000) and regulations set forth in 44 CFR §201.6, *Local Mitigation Plans*. With an approved updated hazard mitigation plan, Cass, Clay, Jackson, Platte and Ray counties and certain cities, school districts, colleges and universities will remain eligible for grants under the following federal hazard mitigation assistance programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Building Resilient Infrastructure and Communities (BRIC)

1.3 Planning Process

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.*

1.3.1 Background

The plan update process was set in motion on January 11, 2024, with MARC staff informing the Metropolitan Emergency Managers Committee (MEMC) that the five-year update to the Kansas City region's hazard mitigation plan was due by June 2025, with a proposed timeline shared at that time. A monthly report on the plan update has been provided to the MEMC at their regular meetings. The MARC Board of Directors, composed of local elected officials from the region's counties and cities, authorized the preparation of the plan at their February 27, 2024, meeting. Communities, both new and past plan participants, were invited to take part in this planning process. They were encouraged to review the current Regional Hazard Mitigation Plan available on the MARC website at https://www.marc.org/Emergency-Services-9-1-1/MEMC/Activities/Regional-Hazard-Mitigation-Plan and to review their current mitigation strategies.

A Steering Committee met 7 times during the planning process –to provide guidance to the Mid-America Regional Council staff in the preparation of the plan. The Steering Committee began meeting in February 2024 and continued with regular meetings throughout the plan's development and adoption.

A formal kickoff meeting was held on May 20, 2024, at the MARC offices in Kansas City, Missouri, with an online option. Representatives from local jurisdictions and the public were invited to hear from local and national speakers on the importance of mitigation planning, steps that jurisdictions have and could take, resources that FEMA has available to assist with mitigation actions, the plan requirements and schedule for preparing and adopting the plan.

There were 59 representatives from local jurisdictions, nonprofit organizations, and federal agencies who registered for the meeting, and 48 attended, including 32 online. Participant discussions were focused around reviewing possible natural hazards of greatest concern to their jurisdictions and the region, and the selection of the priority hazards for the focus of this plan.

MARC assembled an internal team from Emergency Services, Transportation and Environment, Public Affairs and Research Services to work on the plan, and the team met regularly during the plan's preparation. Representatives from SEMA and FEMA were invited to, and SEMA representatives attended the kickoff meeting on May 20, 2024. MARC submitted monthly status reports and kept in contact with SEMA throughout the planning process.

The Steering Committee for the Hazard Mitigation Plan (HMPSC) was formed to guide and coordinate the planning process and to review the plan materials as they were developed. The HMPSC consisted of selected representatives from the Missouri counties in the Planning area, cities within those counties including Kansas City and Independence, Mo., and representatives from underserved vulnerable populations. For a complete listing of HMPC members and their roles and responsibilities see **Attachment 1** to this section. For the MARC Board and MEMC meeting summaries, see **Appendix B: Supporting Documents**.

Before the Steering Committee formally convened, MARC staff reviewed the 2020 Regional Hazard Mitigation Plan, the Missouri State Hazard Mitigation Plan, the Kansas City region's Threat Hazard Identification Risk Assessment (THIRA), FEMA's Local Mitigation Planning Handbook, FEMA's Mitigation Plan Review Guide, and multiple Hazard Mitigation plans from communities all across the country. The MARC staff outlined the process and timeline for completing the HMP update. The proposed planning process and timeline was presented in concept at the May 20, 2024, kickoff meeting and to the HMPSC for discussion at their April 25, 2024, meeting.

1.3.2 Planning Team Kickoff Meeting

The 2025 update planning process formally began at the May 20, 2024, kick-off meeting, where local jurisdiction representatives and other stakeholders were provided with background information, FEMA guidance, requirements for the new plan, the importance of participating in the plan, possible mitigation measures, and a nominal timeline for the plan update process. As its first order of business, the HMPSC adopted the Combination Model (FEMA 386-8, 12) as a means to fulfill the requirements of multi-jurisdictional plan development, similar to the process used for the 2020 update. Through this Combination Model, MARC was designated the Plan Author (authorized to act on behalf of the participating jurisdictions in development of the plan); and the HMPSC was designated the Planning Team. The Planning Team consists of representatives from four of the five participating Missouri counties (Cass, Clay, Jackson and Platte) plus representatives from cities including Kansas City, Missouri, and the city of Independence, and representatives of agencies serving vulnerable populations.

After the model for the Plan update was confirmed, the HMSC identified which threats and hazards would be considered in the update. To assist this determination, the HMSC reviewed hazards identified in the State of Missouri's Hazard Mitigation Plan, the hazards addressed in the region's 2020 Plan (and recommendations for improvements), and hazards identified through the THIRA process. The steering committee decided that the 2025 Plan should focus on priority natural hazards, rather than lower priority natural and man-made hazards. Natural hazards with low occurrence, earthquakes and wildfires, could be removed from the Plan. To consolidate further, similar hazards were grouped together. Drought and heat waves were grouped together as Heat. Flooding (both riverine and flash), levee failures, and dam failures were grouped together as flooding.

Additional business at the kick-off meeting included determination of satisfactory participation requirements for jurisdictions and beginning initial outreach and information collection efforts.

Participation requirements were identified for local jurisdictions to complete in order to obtain the information necessary to inform the update process. For local jurisdictions, eight participation requirements were outlined:

1. Attend a meeting (in-person or virtually) to discuss participation in the plan.
2. For 2020 plan participants, update the 2020 profile for the local jurisdiction using the MARC provided online tool.
3. For new participants, create a new user and complete the online profile.
4. Review the hazard profiles and identify the level of risk and vulnerability for each priority hazard for the local jurisdiction.
5. Develop goals and identify proposed mitigation actions for the community.
6. Prioritize actions emphasizing relative cost-effectiveness.
7. Review and comment on draft plan
8. Communicate about the plan through social media
9. Host opportunities for public involvement (e.g. promote public survey, link local Internet presence to a plan website, share information about the plan at local meetings and events).

In order to achieve the requirements, the HMSC agreed that participating organizations would be asked to provide information for the update through a series of surveys or tools including a Community/ School Profile including a Hazard Mitigation Goals and Actions Status Update for those communities that participated in the last plan, and a 2025 Hazard Mitigation Goals and Actions Tool for new participating organizations to complete. Each county in the planning area agreed to communicate with cities, school districts, universities/colleges, and fire/ambulance districts in summer/fall 2024 to inform them about the hazard mitigation plan update process, the requirements for participation and the various tools for information collection. County emergency managers and MARC staff reached out to jurisdictions that participated in the 2020 plan and others in the five-county area about participating in the 2025 plan. After information had been collected from participants about the hazards most likely to affect their community, their capabilities, and the strategies they selected to address the hazards, preparations were made to share the information with stakeholders and members of the public through posting of the draft plan on the MARC website. Social media was used to promote the draft plan for public review and comment.

All jurisdictions were encouraged to form an internal planning team to review 2020 information and provide updates. All information, including meeting notices, summaries, etc., about the update process was made available in accordance with Missouri Sunshine Law provisions. As such, neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties were provided the opportunity to be involved in the planning process. Additional information regarding Missouri's Sunshine Law can be found on the Web site of Missouri's Attorney General at http://ago.mo.gov/sunshinelaw/. Further, informational updates and participation opportunities were reported at the monthly meetings of the Metropolitan Emergency Managers Committee (MEMC), which are open to the public and other interested parties.

Table 1.1 summarizes the meetings conducted throughout the planning timeline by date held, agenda and attendees (noted by title, agency, organization or jurisdiction). Meeting agendas, summaries and sign-in sheets can be found in **Appendix B: Supporting Documents**.

Table 1.1 Summary of Planning Meetings			
Meeting	**Date**	**Purpose of Meeting**	**Attendees**
HMP Review	Staff met regularly across departments throughout the planning process and between Oct and Dec 2024 with consultant ISC	Discuss revisions and plan reformatting, Adding hazards, mitigation actions, and schedule for future meetings.	Planning Team, MARC
Kick-off	May 20, 2024	Background, Planning Team formation, Initial planning, participation requirements.	Local jurisdiction stakeholders, Planning Team, MARC (59 registered, 48 in attendance in person and virtually)
Hazard Mitigation Steering Committee (HMSC)	February 27, 2024	**Review of the 2020 Plan, Update Process and Timeline,** Regional Hazard Review, Share proposed timeline, key milestones, and deadlines, FEMA's new requirements. **Community and School District Profile and Survey Platform,** Introduction to the new community and school district profiles and survey tools. **Develop an Initial Approach for Stakeholder and Community Engagement,** Identify key stakeholder groups and target audiences, Discuss any changes in stakeholders or key personnel from 2020, Discuss possible outreach strategies for community engagement and input, Regional Kickoff Meeting	Steering Committee members, MARC staff
Hazard Mitigation Plan Steering Committee (HMSC)	April 25, 2024	Kickoff Meeting Plans: Audience, Project Success Story, Data Needs; Steering Committee Expansion; Public Outreach Strategy; Data Gathering Tools and Deadline Discussion; Feasibility of Hosting Regional Mitigation Workshop to share ideas for goals and actions.	Steering Committee members, MARC staff
Hazard Mitigation Plan Steering Committee (HMSC)	May 31, 2024	Discuss feedback from kickoff meeting, possible outreach and meetings to engage jurisdictions, documentation of time and in-kind support	Steering Committee members, MARC staff
Hazard Mitigation Plan Steering Committee (HMSC)	July 31, 2024	Public Survey Launch and Distribution, review of promotional flyer, status of local jurisdictions use of online tools to collect profile and goals information, timeframe to analyze data, updated website information.	Steering Committee members, MARC staff

Table 1.1 Summary of Planning Meetings			
Meeting	**Date**	**Purpose of Meeting**	**Attendees**
Hazard Mitigation Plan Steering Committee (HMSC)	October 15, 2024	Community Profiles/School Profiles Public Survey, initial results, Possible Mitigation Strategies	Steering Committee members, MARC staff
Hazard Mitigation Plan Steering Committee (HMPSC)	November 7, 2024	Update on Community Profile Information and Participation among Cities, Counties, School Districts, Other Districts, Colleges; Discuss how steering committee might help to encourage cities, counties and school districts to participate; how to ensure Quality control; Update on Community Survey and Use of social media, Need to document local actions. Update on Ch. 2 Regional Profile; Update on Ch. 4 Risk Profile Documentation of In-Kind Support	Steering Committee members, MARC staff, consultant
Hazard Mitigation Plan Steering Committee (HMPSC)	December 6, 2024	Update on local jurisdictions completion of profiles and goals/actions; status of plan chapter drafts for review; update on public survey	Steering Committee members, MARC staff, consultant
Metropolitan Emergency Managers Committee	February 13, 2025	Review draft plan and seek feedback	MEMC (emergency managers)
Total Transportation Policy Committee	February 18, 2025	Review draft plan and seek feedback	TTPC members (local elected officials, public works, planning, consultants)

1.3.3 Plan Section Review and Update Methodology

To minimize the burden of the update, the HMPSC determined to revise only those sections where information had changed, new or better data was available, or to address FEMA recommendations for improvements from the 2020 Plan. As discussed in the Background Section 1.3.1 above, MARC staff evaluated the plan in its entirety, determining which sections required revision in accordance with FEMA's *Local Mitigation Plan Review Guide and FEMA Local Planning Handbook* (October 1, 2014 and May 2023) and *Multi-Jurisdictional Mitigation Planning,* 2006 and presented the HMPSC with recommendations. **Table 1.2** describes the data deficiencies that were present during the 2020 plan update process and the status of those data deficiencies for the current plan update process. Any new data sets they have been utilized in the analysis.

The data deficiencies identified here are from the *2020 Plan Implementation and Maintenance* section and new deficiencies identified for the 2020 plan. The "action required" column shows what actions were to be taken in the 2025 plan efforts or future efforts.

Table 1.2 Data Deficiency Corrective Actions 2015 and 2020			
Data Deficiency	**Action Required**	**Status**	**Responsible Party**
1. Dam inundation pathways	Continue to work the MDNR and local dam owners to obtain information/maps showing dam failure inundation pathways as part of EAP update/completion process	Ryan P. Stack ryan.stack@dnr.mo.gov from the DNR provided digital files for Emergency Action Plans with Inundation Maps. MARC staff is reviewing to determine if the digital files address the listed data deficiency.	Planning Team, ISC Consultants
2. Levee failure analysis information largely unavailable	Continue to work with USACE and other entities to obtain levee failure analysis information as it becomes available	Continue to look for this type of information.	Planning Team, ISC Consultants
3. Future land use data unavailable for Ray County	Incorporate future land use maps for Ray County as developed	Ray County was added to the Kansas City MPO planning boundary and MARC has compiled land use information about the county.	Ray County Planning Team representative, MARC
4. Various data collection/interpretation deficiencies were noted for winter weather, heat wave, and drought due to certain inherent limitations	Continue to reassess hazards and data collection methods for next update. As new collection methods and interpretation techniques become available, incorporate into plan update	The drought monitor comprehensive statistics were used to show additional drought information not shown in the 2015 Plan. It displays the percentage of a county in each drought classification on any given week.	Planning Team, MARC, ISC Consultants
5. Utility infrastructure - Research Services of MARC does not currently have access to this data	Through collaboration with jurisdictions and utility companies, MARC continues to work on addressing this.	MARC continues to work on collecting this information.	Planning Team, MARC
6. Data regarding homes without basements to identify neighborhoods most vulnerable in tornado event. The digital database used to provide MARC with data from jurisdictions does not collect this information.	MARC has encouraged local jurisdictions to collect this information to inform hazard planning.	Information is not yet available.	MARC

Table 1.2 Data Deficiency Corrective Actions 2015 and 2020			
Data Deficiency	**Action Required**	**Status**	**Responsible Party**
7. Building counts – not all jurisdictions maintain a GIS layer of building points or building outlines. MARC digitized many buildings by hand as part of a SOLAR grant but will not be able to keep it current.	As jurisdictions develop GIS capabilities this information will be incorporated in future updates.	MARC has developed capacity to quantify building counts based on building outlines and the information was used to assess vulnerable properties in the 100-year floodplain.	Participating Jurisdictions, MARC
8. Critical facilities – don't have measures of size or capacity or capabilities for most of them. This information would help produce more meaningful maps and visualizations.	As jurisdictions continue to implement HAZUS software this information may become more accessible.	MARC has developed extensive databases of critical facilities in the five-county area and that information is provided to each local jurisdiction as part of the online planning tool. Feedback from the local jurisdictions is helping to further refine the datasets. In review of transportation facilities, looking for dataset for low water crossings.	Participating jurisdictions, MARC
9. Addresses of repetitive flood loss properties would have been helpful in mapping the general locations where flooding occurs that is more likely to damage property. (or city or zip code)	Continue to work with jurisdictions and the State Emergency Management Agency to determine options for obtaining this type of information.	Have not collected this information; SEMA provided at county level.	Participating jurisdictions, MARC
10. Map and data of buildings inside the 500-year floodplain to help local officials understand the area vulnerable to large flooding events, particularly as changing climate may increase the potential for impacts in these areas.	Collect and include dataset for 500-year floodplain for five county area and counts of buildings and their values inside the area mapped.	Have not begun this effort.	Participating jurisdictions, MARC

The above table illustrates the results of the plan review and recommendations for revisions, which were subsequently approved by the HMPSC. In addition, **Table 1.3** identifies any format changes that have been made where applicable. MARC staff conducted research, collected information, developed

maps and authored the plan update. As changes, updates and recommendations were drafted into the plan, the HMPSC provided MARC with comments and feedback during planning meetings and via e-mail.

As plan sections were drafted they were posted on the Teams folder for the HMPSC and the MARC website at Hazard Mitigation Plan | MARC and made available to the HMSC members for view and comment.

Table 1.3 Review Process Summary

Section	Reviewed (Yes/No)	Revisions Made (Yes/No)	Basis for Revisions	Summary of Revisions
Introduction & Planning Process	Yes	Yes	Added information on meetings held and public input received	Updated table with additional information
Planning Area Profile	Yes	Yes	Suggested additional demographic detail	Updated with additional data on specific vulnerable populations.
Capabilities Assessment	Yes	Yes	Plan organization New survey tools SEMA review to add information about NFIP	Assembled data for each local jurisdiction from the online data tool in the Capabilities Assessment chapter; added information about NFIP participation
Risk Assessment	Yes	Yes	Consolidated risk assessment and vulnerability analysis. (Chapter 4)	Added detail consistent with FEMA rules in analyzing priority hazards.
Mitigation Strategy	Yes	Yes	Each local jurisdiction was asked to update their goals and strategies given identification of priority natural hazards, risk profiles and presentations of information on possible goals and strategies for consideration.	Compiled new 2025 goals and action steps; asked jurisdictions to either remove “deferred” items or to show as ongoing

Table 1.3 Review Process Summary				
Section	**Reviewed (Yes/No)**	**Revisions Made (Yes/No)**	**Basis for Revisions**	**Summary of Revisions**
Plan Maintenance	Yes	Yes	The online planning tool (or a revised version) will be available to each jurisdiction (and to new jurisdictions) beyond the timeframe of the plan preparation to review information and update their capabilities and goals and strategies.	Updated section to reflect feedback from Steering Committee

1.3.4 Review and Incorporation of Existing Plans

Existing plans, codes, ordinances, programs, resources and staffing were reviewed and integrated in the planning process. The Community Profile tool collected information about the different tools available to communities related to administration, financial planning, education and outreach, and planning and regulation. **Table 1.4** lists the different tools that were included in the Community Profile for communities to report on[i]:

Table 1.4 Community Profile Tools	
Administrative & Technical	**Financial**
Administrative Resources: *Planning and Zoning Commission *Mitigation Planning Committee *Maintenance Program to reduce risk *Mutual aid agreement **Staffing Resources:** *Chief Building Official *Floodplain Administrator *Emergency Manager *Community Planner *Civil Engineer *Public Health Official *IT Support *GIS Coordinator **Technical Resources:** *Warning System/Services *Hazard data and information *Critical Facilities Map/APRS *HAZUS Analysis *Existing Land Use Maps	*Capital Improvement Project Funding *Authority to levy taxes for specific purpose *Fees for water, sewer, gas or electric services *Impact fees for new development *Stormwater utility fee *Incur debt through general and/or special tax bonds *Incur debt through private activities *Community Development Block Grant *Flood Mitigation Assistance Program *Pre-Disaster Mitigation Program *Hazard Mitigation Grant Program

Table 1.4 Community Profile Tools	
*Future Land Use Maps *State Hazard Mitigation Plan *Grant Writing	
Education & Outreach	**Planning & Regulatory**
Existing Warning Systems: *Storm Sirens *Mass Notification Systems *MEMC Project Community Alert *National Weather Service *Kansas City Scout **Community Partnerships:** *Regional Homeland Security Coordinating Committee *Metropolitan Emergency Managers Committee *Mid-America Local Emergency Planning Committee *Metropolitan Official Health Agencies of the Kansas City Area *SAVE Coalition *Kansas City Organization Active in Disaster *Community Emergency Response Team *Medical Reserve Corps of Greater Kansas City ** Ongoing public education (PrepareKC) *Natural disaster or safety related school program *StormReady certification *Firewise Communities certification *Public-private partnership initiatives (disaster related) *Media coverage and Public Awareness	**Plans:** *Comprehensive Master Plan *Capital Improvement Plan *Economic Development Plan *Local Emergency Operations Plan *Continuity of Operations Plan *Public Health Emergency Preparedness Plan *Transportation Plan *Stormwater Management Plan *Community Wildlife Protection Plan *Brownfields Redevelopment *Climate Change Adaptation **Codes:** *Building Code *Fire Code *Mechanical Code *Plumbing Code *Dangerous Building Code **Land Use Planning Policies:** *Stream setback ordinances *Floodplain management ordinances *Soil and erosion ordinances *Burn ordinance *Storm water runoff ordinances *Water conservation measures *Open space acquisition/dedication *Flood buyout *Site plan review requirements.

For each tool, one of the questions asked was if the jurisdiction had reviewed that tool during the Hazard Mitigation Plan update. Where applicable, the Community Profile requested jurisdictions describe how these documents and measures were integrated in the planning process. School districts, universities and colleges were polled on a different set of tools including:

- ✓ Evacuation plans
- ✓ Storm Sheltering Plan
- ✓ Shelter-In-Place Plan
- ✓ Infectious Disease Plan
- ✓ Water Conservation Measures

- ✓ Security Plan

Section 3 includes a summary of the tools included in the Community Profile and the School Profile. The tools were web-based through a portal on the MARC website to enable jurisdictions to provide updated information on their jurisdictions' profiles, risks and updated hazard mitigation goals and actions. A GIS tool has allowed jurisdictions to review data through a series of GIS layers to consider further impacts to their jurisdiction from the priority hazards addressed in the plan and review resources for the plan to inform their goals and strategies. Hazard Mitigation

1.3.5 Public Involvement

Hazard mitigation planning is best accomplished when those with a stake in the plan are actively involved. Because hazards can affect everyone, these stakeholders are not just local government officials, but also private industry, nonprofit organizations and most importantly private citizens. Seeking public feedback on the mitigation strategies considered by each jurisdiction ensures that the concerns of the community are adequately addressed and provides insight as to where scarce resources might best be used.

In order to make best use of limited time and resources during the planning process, local jurisdictions were asked to share information about the plan with their stakeholders and to help in promoting a public survey to engage residents and seek their input on hazards of concern, actions that local jurisdictions could take, how residents receive information about emergency events and how they could be better informed. Social media posts were placed as well as some paid media, email communications, use of QR codes and e-news articles were all used to promote the survey. A flyer promoting the survey was posted on the MARC website and made available to the Metropolitan Emergency Managers Committee, the Hazard Mitigation Steering Committee and others that were identified as having possible interest in the Plan.

Table 1.4 details actions taken to promote the plan and encourage participation in the public survey.

Table 1.5 MARC Stakeholder Community Engagement

Event date	Description of Event, Location	County	Media Used
May 20, 2024	Kickoff Meeting at MARC offices, 600 Broadway, Kansas City, MO and online	Cass, Clay, Jackson, Platte, Ray	Flyer and HMTL invitations sent to large group of local stakeholders Used MARC website to promote event
May 2024	Posted information about the Hazard Mitigation Plan update on the MARC website and a link to a public survey	Cass, Clay, Jackson, Platte, Ray	Promoted the website address to stakeholders of jurisdictions, committee members and the public.
June 2024	Prepared and disseminated a flyer with a QR code about the plan and the public survey. Encouraged residents to complete the online survey.	Cass, Clay, Jackson, Platte, Ray	Worked with steering committee members and others to share the flyer through electronic means and as handouts at community events.

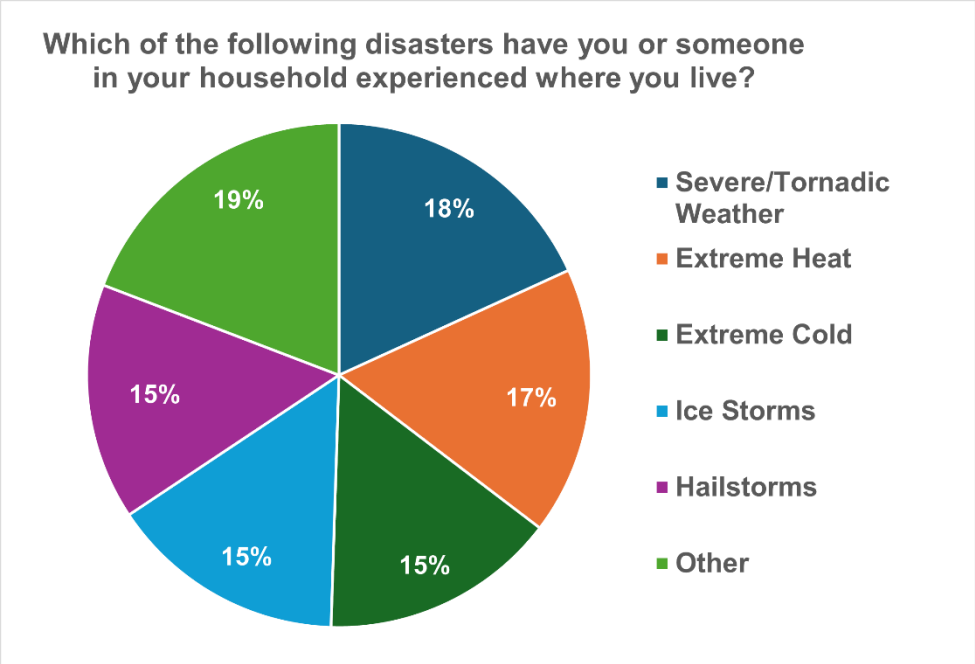
Table 1.5 MARC Stakeholder Community Engagement			
Event date	**Description of Event, Location**	**County**	**Media Used**
June 27, 2024	Community Organizations Active in Disaster (COAD) meeting at MARC and online	Cass, Clay, Jackson, Platte, Ray	Presented information on the HM Plan and solicited input on greatest threats to vulnerable populations and steps that jurisdictions could take to support these populations.
November 2024	Prepared and disseminated a flyer with a QR code about the plan and the public survey. Encouraged residents to complete the online survey.	Cass, Clay, Jackson, Platte, Ray	Used social media - Facebook and Instagram to run through end of November 2024. Message showed up in feeds 15,382 times, reached 7,728 accounts and received 191 clicks on the links. The click rate was above 1%, a reasonable average. Placed print ads for Spanish version in two print newspapers – Dos Mundos and KC Hispanic News. Costs for English and Spanish media $420.
February 2025	Draft plan posted on MARC website for review. Jurisdiction stakeholders and the public encouraged to review and submit feedback through online survey.	Cass, Clay, Jackson, Platte, Ray	MARC website and email communication

Posts were created on MARC's social media sites including Instagram and Facebook. A homepage story was created on the MARC Web site. E-mail invitations were sent through MARC listservs, requesting regional partners and committees forward to their constituents. Jurisdictions were provided with fliers advertising the plan and public survey for distribution around their community. Webs URL links and QR codes were used to help residents and stakeholders gain access to information. Additionally, jurisdictions were asked to link notices for the plan and public survey to their local government and school district Web sites, where applicable. Jurisdictions were also asked to use any other available outlets to advertise the events, such as e-newsletters and posting information to their own social networking accounts.

Public Survey Results

The public survey was intended to seek input into the plan, gaining an understanding of the public's awareness of natural hazards, hazards that have affected them personally, ones they feel their community is most at risk for in the future, what steps their community has taken to reduce risks to injury and property damage, and what further steps might be helpful.

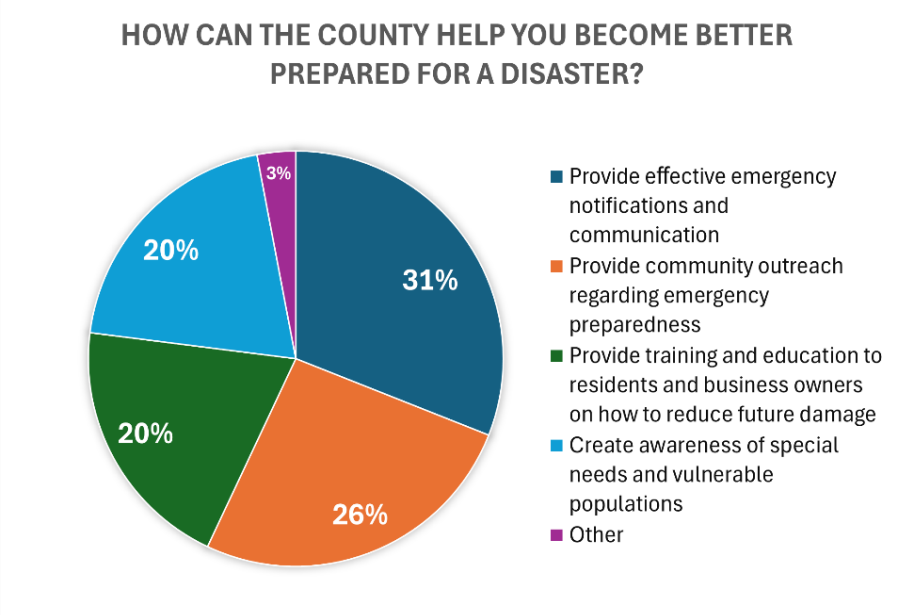
Q1. Which of the following disasters have you or someone in your household experienced where you live now? Windstorms and tornadoes were most often cited followed by extreme heat, ice storms, extreme cold and hail. Other disasters mentioned were earthquakes and wildfires.



Q2. Which disasters have you experienced most frequently? Severe thunderstorms/tornadoes 29%, extreme heat 22%, ice storms and extreme cold 25%.

Q3. Have you experienced flooding? Only 1 of 5 respondents.

Q4. What mitigation actions do you feel could help best protect your community? Protecting utilities and other infrastructure, including drainage systems 36%, protect health care and emergency services' facilities 17%, help provide property owners with dollars 12% and enact local ordinances and building standards 12%.



Q5. How could your county (or city) best support you to lessen your risk from natural hazards? Emergency notification systems and communications 31%, community outreach 25%, create awareness of special needs/vulnerable populations 21% and train and educate residents and business owners on measures to reduce their risks 20%.

One-fourth of respondents did not feel adequately informed about risks to their community, indicating an opportunity to educate the region's population. Social media, television and email were the most often cited ways that respondents received information.

Draft Plan Review

The final plan, prior to submission to SEMA and FEMA, was provided to all participating jurisdictions. The plan was placed in its entirety on MARC's website and an online feedback mechanism was created to provide a concluding opportunity for the public to comment on the plan. MARC staff issued press releases, used social media and sent email notifications through local list servs on how to provide feedback. Jurisdictions were again asked to link these items to their Websites as well as utilize other available outlets to spread the word regarding the final review period.

Following SEMA's approval of the plan "pending adoption" and prior to formal adoption of the plan, jurisdictions were encouraged to hold public meetings to discuss the plan's adoption.

Copies of meeting notices, fliers, advertisements, press releases, etc. are provided in Appendix B: Supporting Documents.

[i] FEMA. Worksheets 4.1- 4.3 Capability Assessment Worksheet, Safe Growth Audit, National Flood Insurance Program Worksheet. Local Mitigation Planning Handbook, March 2013 and May 2024.

ATTACHMENT 1: HAZARD MITIGATION PLANNING COMMITTEE (HMPC) MEMBERS ROLES AND RESPONSIBILITIES

I. Roles

A. *Planning Team:*

Justin Crane, Director, Cass County Emergency Management

Representing the following Cass County Communities:

- Belton
- Harrisonville
- Lake Annette
- Lake Winnebago
- Peculiar
- Pleasant Hill
- Raymore
- Archie R-V School District
- Harrisonville School District
- Pleasant Hill School District
- Raymore-Peculiar School District
- Sherwood-Cass School District

Anne Poelzl, Clay County Assistant Emergency Management Director

Representing the following Clay County Communities:

- Excelsior Springs
- Gladstone
- Kearney
- Lawson
- Liberty
- North Kansas City
- Pleasant Valley
- Smithville
- Excelsior Springs School District
- Lawson School District
- North Kansas City School District
- Smithville R-II School District

Troy Schulte, County Administrator, Jackson County

Replaced with: Brian Gaddie, Public Works Director, Jackson County

Representing the following Jackson County Communities:

- Blue Springs
- Grain Valley
- Grandview
- Greenwood
- Independence
- Kansas City
- Lee's Summit
- Oak Grove
- Raytown
- Central Jackson County Fire Protection District
- Sni Valley Fire Protection District
- Blue Springs School District
- Grain Valley School District
- Ft. Osage School District
- Independence School District
- Kansas City School District
- Lee's Summit School District
- Oak Grove R-VI School District
- Metropolitan Community Colleges

Jason Phelps, Deputy, Platte County Sheriff's Department (Appointed by, Capt. Daniel Gates, Platte County Emergency Management Coordinator, Platte County Sheriff's Dept.)

Representing the following Platte County Communities:

- Farley
- Lake Waukomis
- Northmoor
- Parkville
- Platte City
- Platte Woods
- Riverside
- Tracy
- Weatherby Lake
- Weston
- Northland Regional Ambulance District (NRAD)
- Park Hill School District
- Park University

- Platte County R-3 School District
- West Platte R-II School District

Dante Gliniecki, Emergency Manager, City of Independence

Christopher Carroll, Assistant Emergency Manager, Kansas City, Mo. Emergency Management

B. ***Plan Author, Mid-America Regional Council (MARC):***

Marlene Nagel, Community Development Director

- Project oversight and plan author

Melinda Cheney, Emergency Services Planner (was deployed in Sept. 2024)

Erin Lynch, Emergency Services and Homeland Security Program Director

- Project oversight

John Davis, Emergency Services Fiscal Administrator

- Data management

Jay Hermann, GIS Manager, Research Services

- Research and Data lead

Tim Victor and Sara Hintze, Database Analysts, Research Services

- Developed online tools to collect/update jurisdiction profiles and goals and strategies

Jakob Goldman, GIS Specialist II

- GIS mapping, coordination and research

Tina Sikes, GIS Specialist II

- GIS mapping and research

Catherine Couch, Public Affairs Coordinator

- Lead graphic designer; marketing coordinator

Kristin Johnson-Waggoner, Public Affairs Program Director

- Editor, graphic design

Nordia Epps, Public Affairs Coordinator II

- Traditional Media and Social Media coordinator

Caroline Knecht, Public Affairs Website Coordinator

- Web site design

Sasan Baharaeen, Manager of Information Services

- Database design and maintenance, IT support

Madeline Wetta, Data Librarian

- Research and data

II. Responsibilities

A. *Plan Author*

1. Provide administrative support for the update process to include, but not limited to:

   a. Organize meetings, send mailings, draft and incorporate plan revisions, conduct research, etc.

   b. Provide the Planning Team with recommendations and advice on plan requirements as well as electronic and/or hard copies of updates to the plan as they are drafted for review and comment

   c. Assist in the development of mitigation strategies.

   b. Provide monthly updates and other information as requested to SEMA in accordance memorandum of agreement.

   d. Compile comments, revisions, evaluations, etc., from future reviews and updates and integrate into plan.

B. *Planning Team*

1. Oversee the update process to include, but not limited to:

   a. Determine requirements for satisfactory participation.

   b. Review and approve all revisions to the hazard mitigation plan.

   c. Provide locations to host meeting opportunities and guide public engagement actions.

d. Work with represented jurisdictions to assist in gathering required information and developing mitigation strategies.

e. Organize yearly reviews of the plan for represented jurisdictions. Review all new information submitted and forward to Plan Author for incorporation.

C. ***Participating Jurisdictions***

1. Inform the update process by accomplishing the following:

a. Complete all requirements for satisfactory participation as determined by the Planning Team.

b. Review and comment on the plan as drafts become available. Formally adopt the completed plan by resolution.

c. Participate in yearly reviews of the plan and subsequent five-year updates. Submit changes as necessary to Planning Team representative for review and forward to Plan Author.

d. Designate a responsible party to coordinate the above and notify Planning Team representative of designee by name, job title, organization or any other satisfactory method upon appointment or when a change occurs. Responsible parties for participating jurisdictions shall be listed in **Attachment 2** to this section.

ATTACHMENT 2: 2024-25 PARTICIPATING JURISDICTIONS' DESIGNATED RESPONSIBLE PARTIES

Jurisdiction	Responsible Party (Name)	Title
1. Cass County	Justin Crane	Emergency Management Director
2. Clay County	Anne Poetzl	Emergency Management Director
3. Jackson County	Troy Schulte, Brian Gaddie	Emergency Management/Public Works Director
4. Platte County	Deputy Jason Phelps Captain Daniel Gates	Assistant Emergency Management Coordinator Emergency Management Coordinator
5. Ray County	Sheila Tracy	Presiding Commissioner
6. Belton	Claire Canaan	Emergency Management Director
7. Blue Springs	Mike Mallon	Senior Development Director
8. Central Jackson County Fire Protection District	Jason Bonney	Asst. Fire Chief/Emergency Management
9. Excelsior Springs	Joe Maddick	Fire Chief
10. Farley	Kathy O'Neal	Chair of the Board of Aldermen
11. Gladstone	Mike Desautels	Emergency Management Director/Fire Chief
12. Grain Valley	Ken Murphy	City Administrator
13. Grandview	Emily Spittler	Planner
14. Greenwood	Mitchell Armer	Police Chief
15. Harrisonville	Rusty Sullivan	Fire Chief/Emergency Services Director
16. Independence	Dante Gliniecki	Emergency Preparedness Planner
17. Kansas City, Mo	Christopher Carroll	Emergency Management Manager
18. Kearney	David Pavlich	Community Development Director
19. Lake Annette	Angela Hansen	Mayor
20. Lake Waukomis	Rick Zelfer	Emergency Management Director
21. Lake Winnebago	Kenneth Smith	Emergency Management Director
22. Lawson	Bruce Summa	Police Chief
23. Lee's Summit	Benjamin Hicks	Assistant Chief of Emergency Management
24. Levasy	Kim Dyer	Mayor
25. Liberty	Chris Young	Fire Chief
26. North Kansas City	Dan Williams	Fire Chief/Emergency Management Director
27. Northland Regional Ambulance District	Jason S James	Executive Director
28. Northmoor	Julie Rowden	City Clerk
29. Oak Grove	Mark Sherwood	Emergency Management Director
30. Parkville	Jon Jordan	Captain, Police Dept.
31. Peculiar	Don Shepard	Police Chief and Interim City Administrator
32. Platte City	Tom Cole	City Administrator

Jurisdiction	Responsible Party (Name)	Title
33. Platte Woods	Jim Kerns	EM Director
34. Pleasant Hill	Tommy Wright	Chief of Police
35. Raymore	Tim Baldwin	Emergency Management Coordinator
36. Raytown	Dyon Harper	Police Captain/EM Coordinator, Police Dept.
37. Richmond	Mark Sowder	Fire Chief/EM Director
38. Riverside	Keith Payne	Emergency Manager/Chief of Police
39. Sni Valley Fire Protection District	Mark Sherwood	Emergency Management Director
40. Smithville	Jason Lockridge	Police Chief
41. Tracy	Lori Liechti	City Clerk/Collector
42. Weatherby Lake	Donnie Hackman	Chief of Police
43. Weston	Kelly Clark	Chief of Police
44. Archie R-V School District	Dr. Michelle Wityk	Superintendent
45. Blue Springs School District	Mike Russell	Chief, Director of Public Safety
46. Excelsior Springs School District	Jaret Tomlinson	Superintendent
47. Ft. Osage School District	Steve Morgan	Assistant Superintendent
48. Grain Valley School District	Dr. Nick Gooch	Assistant Superintendent
49. Harrisonville School District	Josh Chastain	Superintendent
50. Independence School District	Greg McGhee	Director of Facilities
51. Kansas City School District	Whitney Morgan	Facilities Manager
52. Lawson School District	Michael Stephenson	Superintendent
53. Lee's Summit School District	Ryan Hall	Supervisor of Safety & Environmental Services
54. North Kansas City School District	Mitzi Boydston	Director of Safety & Security
55. Oak Grove R-VI School District	Tracy Kemp	Principal and Safety Coordinator
56. Park Hill School District	Jaime Dial	Director, Safety and Security
57. Platte County R-III School District	Dr. Devin Doll	Exec. Director of Operations
58. Pleasant Hill School District	Wayne Burke Mike Clevenger	Superintendent Director of Facilities

Jurisdiction	Responsible Party (Name)	Title
59. Raymore-Peculiar School District	Bryan Pettengill	Assistant Director of Operations
60. Richmond School District	Trey Cavanah	Assistant Superintendent
61. Sherwood-Cass School District	Morris Jeffries	Director of Facilities
62. Smithville R-II School District	Robert Newhart	Director of Operations
63. West Platte R-II School District	Brock Dover	Superintendent
64. Metropolitan Community Colleges	Andrea Schatz	Chief Legal Officer
65. Park University	Jeff Hurley	Director of Campus Safety

Chapter 2: Planning Area Profile

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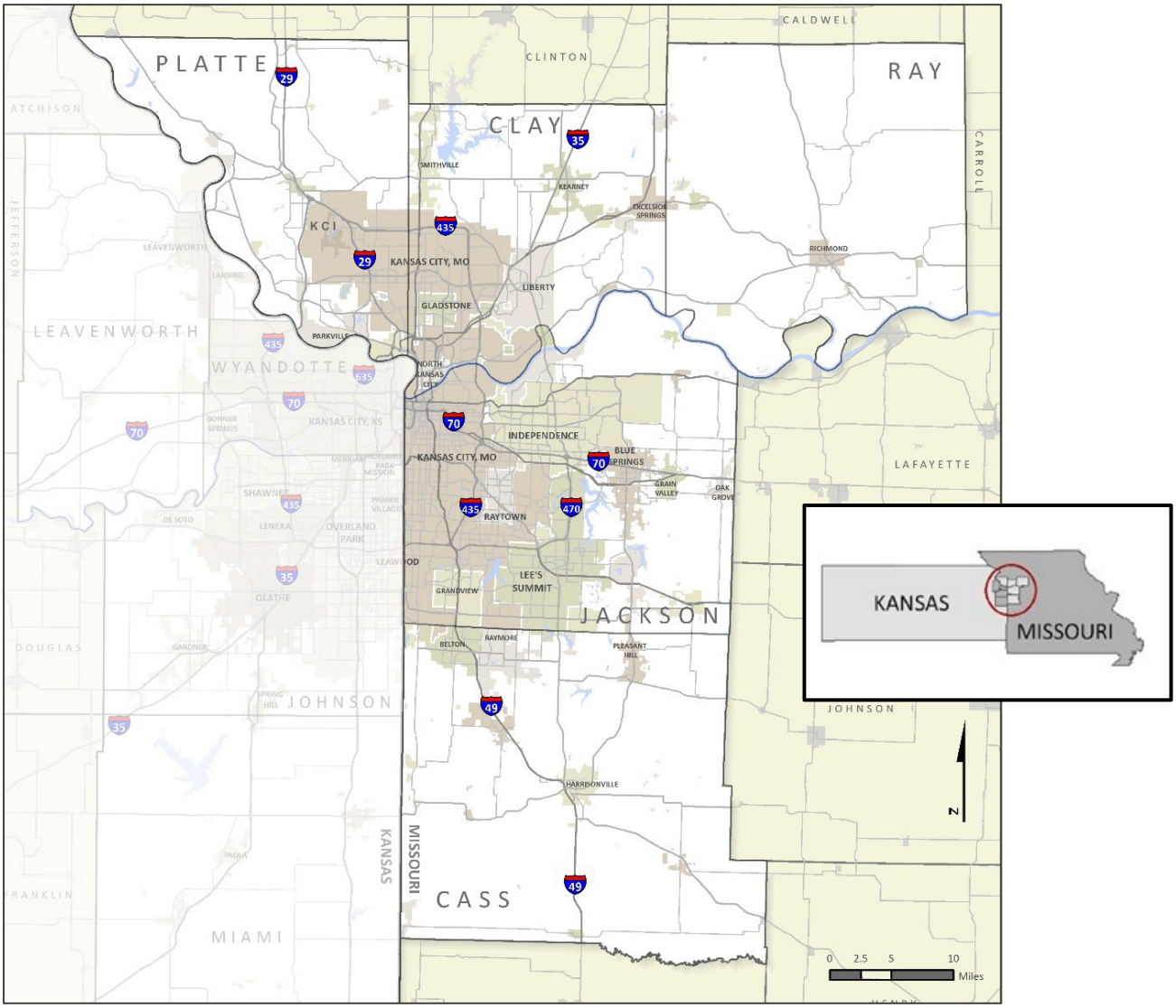
Chapter 2: Planning Area Profile

This Section discusses the people, economy and jobs, property and infrastructure that, together, comprise the region's assets and capabilities at risk from hazards, should they occur.



Source: MARC

Figure 2.1: The Hazard Mitigation Planning Area

2.1 Planning Area Description

The planning area for this regional hazard mitigation plan is the five counties on the Missouri side of the Kansas City region – Cass, Clay, Jackson, Platte and Ray **(Figure 2.1)**. Because of the integrated nature of this region, some trends, assets and capacities are best understood if initially described from the point of view of the entire region before describing the jurisdictions in the planning area in more detail, and some important contextual data is only available for the 9-county MARC region or for the entire 14-county Kansas City metropolitan area. The focus of this chapter remains on the five Missouri counties in the planning area.

2.2 Planning Area Geography and Environment

2.2.1 Geography

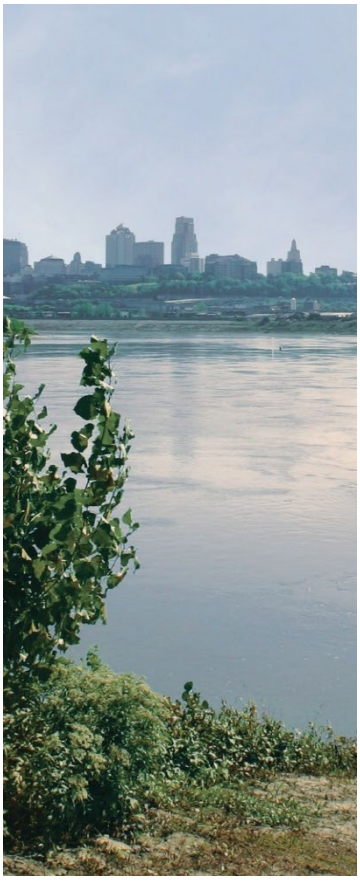


Figure 2.2: Kansas City at the Confluence of the Missouri and Kansas Rivers

Located at the confluence of the Missouri and Kansas rivers, Kansas City began in the mid-1800s as a trading post and jumping-off point for pioneers heading west on the Santa Fe, California and Oregon trails.

The five Missouri counties that make up the Regional Hazard Mitigation Planning Area—Cass, Clay, Jackson, Platte and Ray— have a combined area of over 2,700 square miles. The region is located in the west-central and northwest parts of Missouri. It falls within the Central Dissected Till Plains and Osage Plains sections of the Central Lowlands, as defined by the U.S. Geological Survey and the Missouri Ecological Classification System.

Elevations in the region range from a low of 656 feet above sea level in Ray County to a high of 1,181 feet above sea level in Platte County, with most of the area falling between 700 and 1,000 foot elevations. Soils are mostly fertile and well drained, and are formed of loess, residuum and alluvium. The region's underlying bedrock consists of shale, limestone and sandstone.

Topography in the region is heavily influenced by the Missouri and Kansas rivers and their tributaries **(Figure 2.2)**. Much of the land is level to sloping, especially in floodplains and bottomlands, with uplands ranging from moderate slope to occasional steep bluffs and hills.

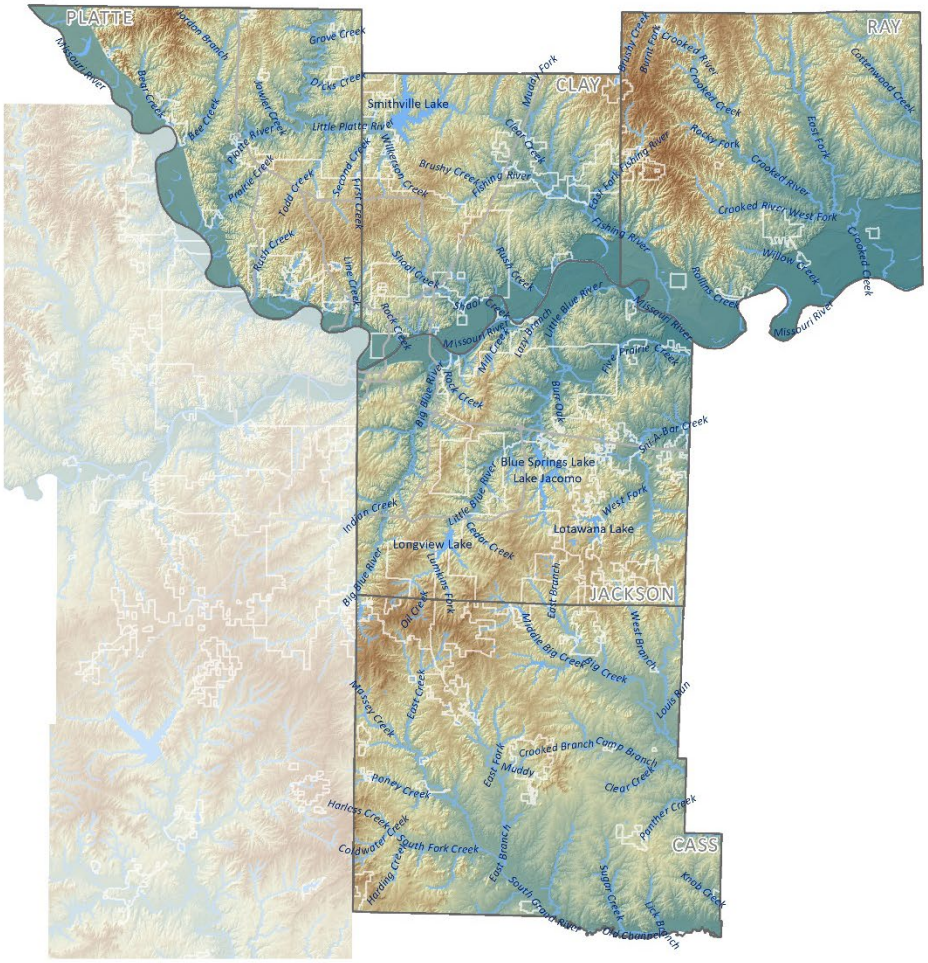
2.2.2 Waterways and Water Resources

Water, particularly surface water, is a great natural resource in the Kansas City area. The region is drained by three river basins: The Lower Missouri-Grand-Chariton River Basin, the Lower Missouri-Blackwater-Lamine River Basin and the Osage River Basin. The vast majority of the region's watersheds drain into the Missouri River, which is one of Missouri's (and the nation's) major rivers. In Cass County, however, watersheds drain into the Osage River Basin. See **Figure 2.3** Waterways and Topography in the Greater Kansas City Region on the following page.

Much of the region's water supply comes from the Missouri River, and in recent years degradation of the riverbed has become a concern. The U.S. Army Corps of Engineers conducted a multiyear study beginning in 2014 to assess riverbed degradation between Rulo, Neb., and St. Louis, Mo., focusing on the stretch of river in the Kansas City area where degradation is the most severe. The final Missouri Riverbed Degradation Feasibility Study Technical Report was completed in May 2017. The study determined the causes of degradation, explored how future degradation can be prevented, and recommended ways public infrastructure can be protected.

According to the U.S. Army Corps of Engineers, the average flow of the region's major rivers and streams range from a high of 35,070 million gallons per day in the Missouri River to a low of less than 13 million gallons per day in some of the region's small streams.

Some of the region's rivers, such as the Missouri River, are subject to minimum flow requirements in order to maintain water quality standards. The minimum flow requirement for the Missouri River is



Source: MARC

Figure 2.3: Waterways and Topography in the Greater Kansas City Region

2,620 million gallons per day. This requirement is maintained by the Corps' regulation of upstream reservoirs and their respective dams in Montana, North and South Dakota and Nebraska — Fort Peck, Garrison, Oahe, Big Bend, Fort Randall and Gavins Point. There are no designated wild and scenic rivers under the National Wild & Scenic Rivers System in the five-county area.

In the Kansas City area, significant quantities of ground water are found only in alluvial deposits along the Missouri River. These alluvial deposits can be more than 100 feet deep in the Missouri river valley (with an average depth of 80 to 90 feet). Saturated water- bearing materials range in depth from 30 to 60 feet, although they are generally found near a depth of 40 feet. Water wells in these alluvial deposits can yield from 1,500 to 2,000 gallons per minute, with an average yield between 500 and 1,000 gallons per minute.

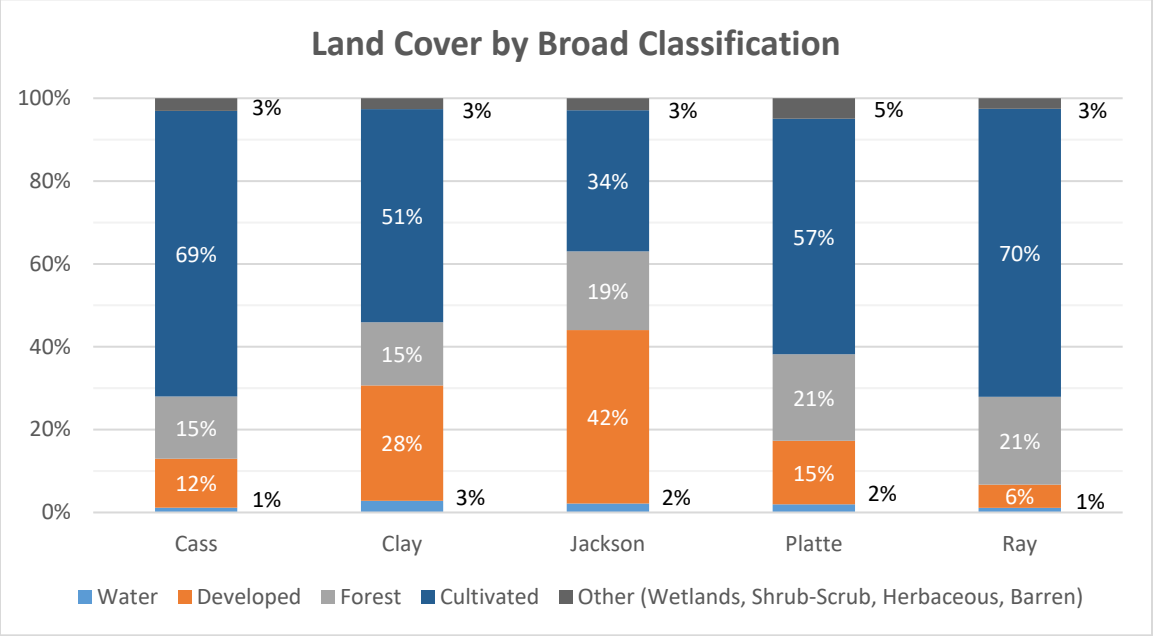
In the region's tributary valleys, the availability of ground water is limited. The alluvial deposits in these areas range in thickness from 20 to 70 feet in the lower reaches to less than 10 feet in the upper reaches. In addition, the large amounts of shale in these tributary valleys results in mainly clay fill sediments in the alluvial aquifer. Because this material has a low water transmissibility, water well yields in these areas

can be as low as one to 10 gallons per minute. Tributaries in areas comprised mainly of sandstone, however, may produce wells with higher yields, since these areas have sediments with greater water transmissibility.

Aquifers in the region's uplands are found in materials of glacial origin or from weathered materials above bedrock. Neither of these areas produces substantial yields of ground water. Although some ground water yields in areas of glacial deposits can exceed 100 gallons per minute, the varying thickness of glacial deposits results in highly variable yields of ground water. Ground water from areas with deposits of material over bedrock provide yields that are generally less than 10 gallons per minute, although some isolated yields can be greater. In addition, water from bedrock tends to be mineralized and contains hardness and iron that exceed national drinking water standards.

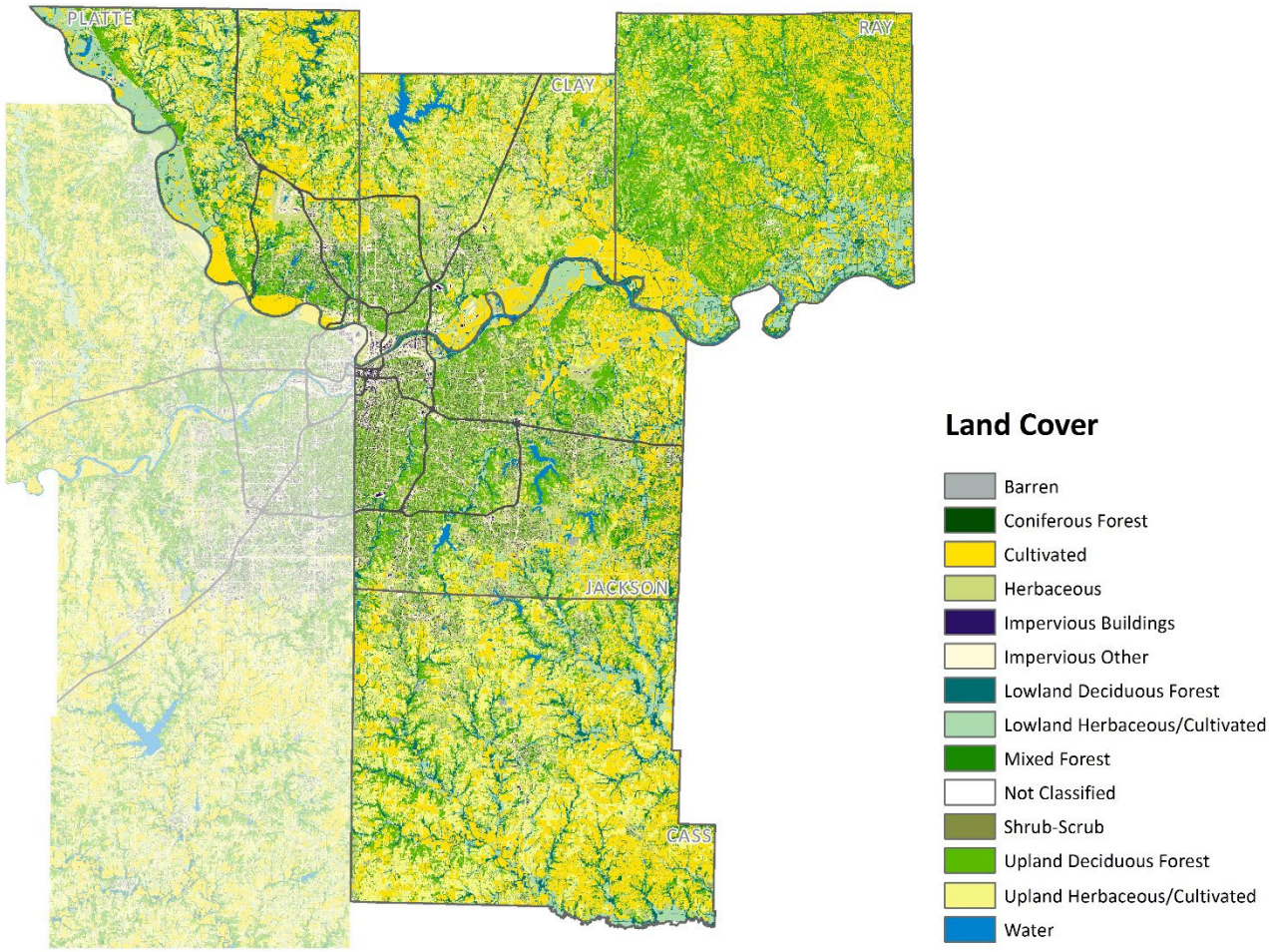
2.2.3 Land Cover

In **Figure 2.4**, Jackson, Clay, and Platte counties are the Planning Area's most urbanized counties with 42 percent, 28 percent and 15 percent impervious surface land cover, respectively. Jackson and Clay counties also have the highest percentages of water in the planning area, at 3 percent each. Ray County is the planning area's most rural county, with 70 percent of its land cultivated, another 21 percent in forests and only 6 percent as impervious surface. The next most forested counties are Jackson and Platte, with 19 percent and 16 percent forest land cover, respectively. Just over two-thirds of the land in Cass is cultivated, as is a majority of the land in Platte and Clay counties. **Figure 2.5** gives a view of the planning area's natural resources.



Source: MARC Natural Resource Inventory 2024

Figure 2.4: Land Cover by County

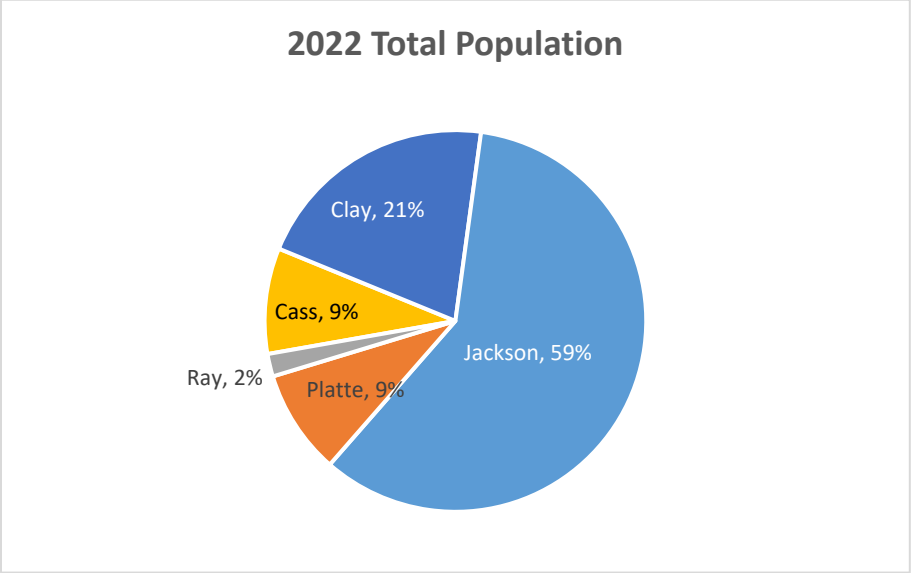


Source: MARC Natural Resource Inventory

Figure 2.5: Topographical Land Cover

2.3 Demographics

Figure 2.6 Planning Area Population



Source: ACS Census Bureau 2022 Estimates

The population of the planning area in 2022 was an estimated 1,206,971. As the graph above (**Figure 2.6**) shows, almost six in ten people living in the planning area reside in Jackson County, making it the most populous county. Clay County follows, with about two in ten area residents living there. A little less than one in ten people live in Cass and Platte counties, with the remainder in Ray County.

2.3.1 Population Density

Population is densest in Jackson County, especially in Kansas City inside the I-435 loop, where a combination of smaller lot sizes and larger quantities of multi-unit housing. Suburban cities such as Independence, Grandview, Lee's Summit, Blue Springs, Gladstone and Liberty have lower average densities. **Figure 2.7** shows the area's 2022 population density by census tract on the next page.

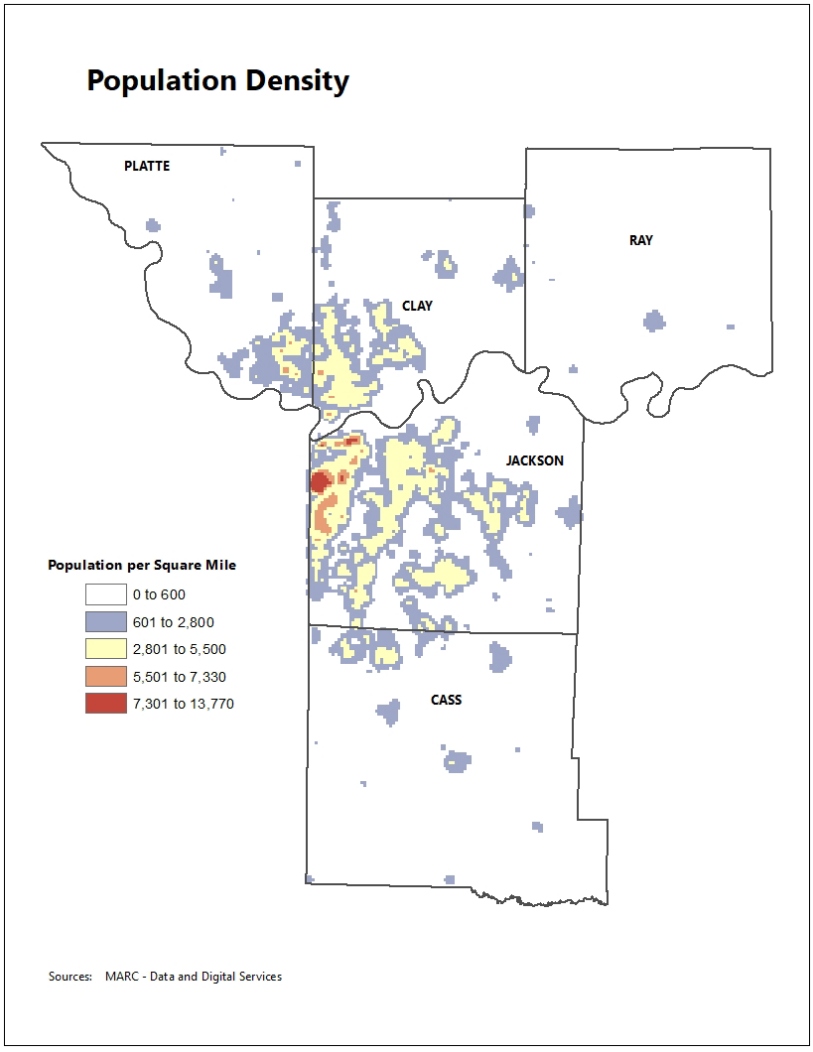


Figure 2.7: Planning Area Population Density, 2022

Source: MARC

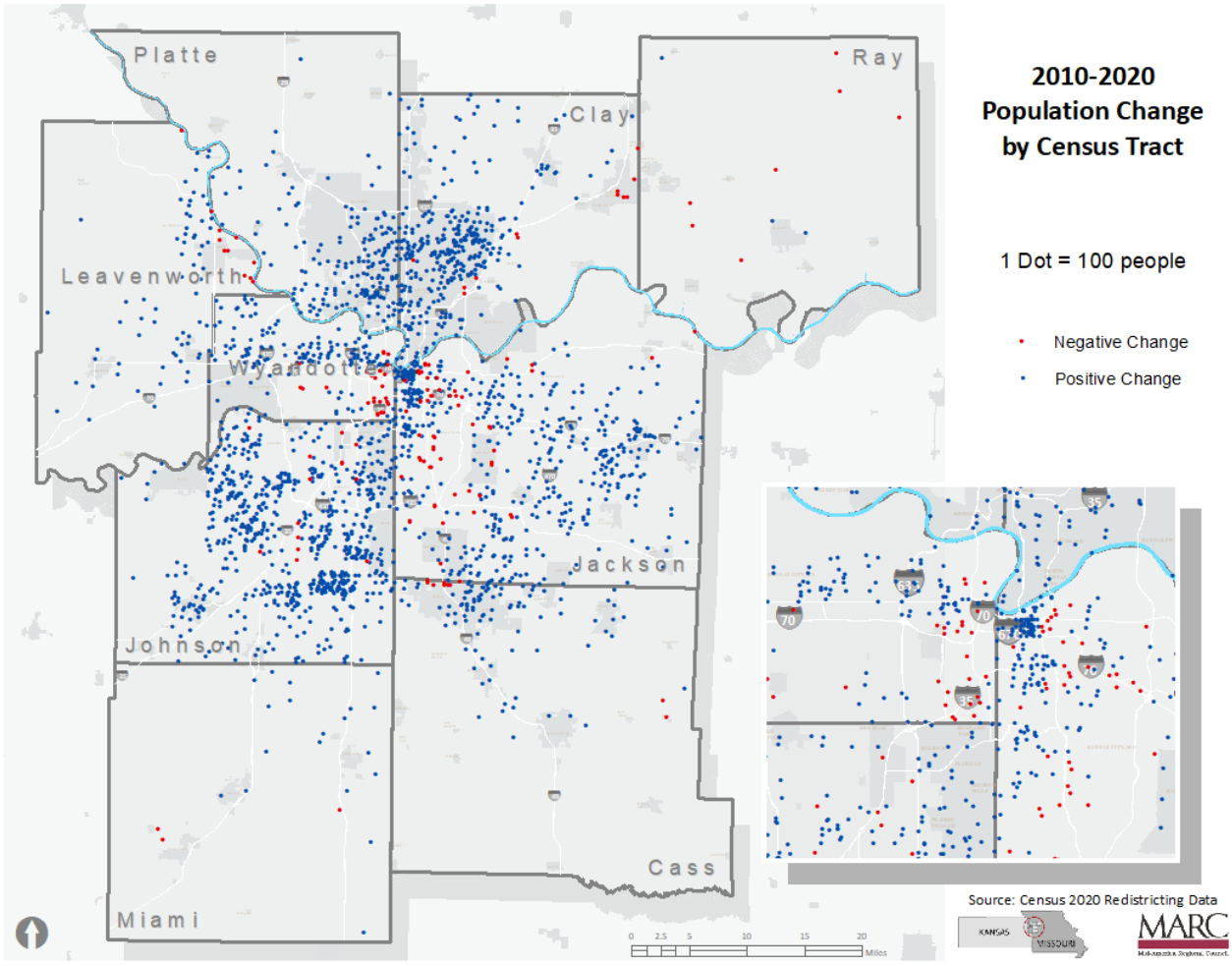
2.3.2 Population Trends – Total Population

The population of the nine-county MARC region grew by over 136,000, or seven percent, from 2015 to 2022, from 1,999,251 to 2,1,03,419 (US Census Bureau, American Community Survey). The planning area's population grew from 1,143,266 in 2015 to 1,206,971 in 2022 and accounted for 51 percent of this growth, or 63,705 individuals. The five-county planning area is growing faster than the MARC region as a whole. **(Table 2.1)**.

Table 2.1: Population, 2015-2022					
County	**2015**	**2020**	**2022**	**2015-2022 Change**	**2015-2022 % Change**
Cass	101,389	107,824	108,205	6,816	7%
Clay	235,344	253,335	253,085	17,741	8%
Jackson	687,182	717,204	715,526	28,344	4%
Platte	96,552	106,718	107,033	10,481	11%
Ray	22,799	23,158	23,122	323	1%
Planning Area	**1,143,266**	**1,208,239**	**1,206,971**	**63,705**	**6%**
MARC 9-county Region	1,999,251	2,103,419	2,102,064	102,813	5%
Kansas City	475,368	508,090	502,597	27,229	6%

Source: Census Bureau, 2020 decennial census, plus 2015 and 2022 ACS population estimates.

The more suburban counties of Cass, Clay and Platte grew by 7 percent or more between 2015 and 2022. Clay and Platte grew faster than the regional average, with 8 percent and 11 percent, respectively. Jackson County gained the most residents – 28,344 residents over the period. However, Platte had the highest percent increase. Cass County's rate of population growth has slowed somewhat since the growth in that county in the early 2000s. However, the county has grown by almost 7,000 persons since 2015. (US Census Bureau, American Community Survey). Ray County, the region's most rural county, recorded a slight increase over the period, adding 323 residents.



Source: Census Bureau, 2010 and 2020 decennial censuses

Figure 2.8: Area Population Change, 2010-2020

While most of the growth in recent decades has been concentrated in suburban areas, the region's urban center is experiencing growth in many neighborhoods, particularly around downtown and the southwest Kansas City, Missouri corridor. Jackson County's overall rate of growth lags slightly behind the region's, at 4 percent over the period. As the region's largest county, the low rate of growth still translates into adding over 28,000 people during the period, the highest level among Missouri side counties. (Figure 2.8).

The portions of the planning area experiencing population decline are concentrated in the southeast part of the city of Kansas City, Missouri, south of the Missouri River. However, Kansas City is benefiting from the substantial reinvestment and redevelopment in and around its downtown, which has resulted in an increase in the population there for the first time in decades. The 2022 population estimates show a 6 percent increase in Kansas City over the 2015-2022 period. In addition, Kansas City also includes most of the high-growth areas north of the Missouri River in Clay and Platte counties. For the five-county planning area as a whole, the growing areas outweigh the declining areas, resulting in an increase of 63,705 residents between 2015 and 2022, a 6 percent increase.

2.3.3 Population by Age

The data collected for this section came from the Census Bureau and the American Community Survey, Five-Year Estimates. This source offers data that is current through 2022. For this Plan update, the data covers a seven-year period, 2015-2022. Table 2.1: Population, 2015-2022, shows the total population as calculated starting in 2015.

The aging of the population is part of a long-term, national trend, caused by improvements in life expectancy and the aging of the post-World War II baby boom population. This is reflected locally by the median age increasing in all counties between 2017 and 2022 (American Community Survey). Jackson and Clay are the youngest counties, 37.0 and 37.5, respectively. Ray County's population is the oldest, with a median age of 42.0 years, having increased 0.2 years over the seven-year period. Meanwhile, the city of Kansas City is the youngest major jurisdiction, with a median age of 35.4 years. Changing race and ethnicity of the population played a role in moderating the increase in that county's median age. (Census Bureau, American Community Survey 2017-2022).

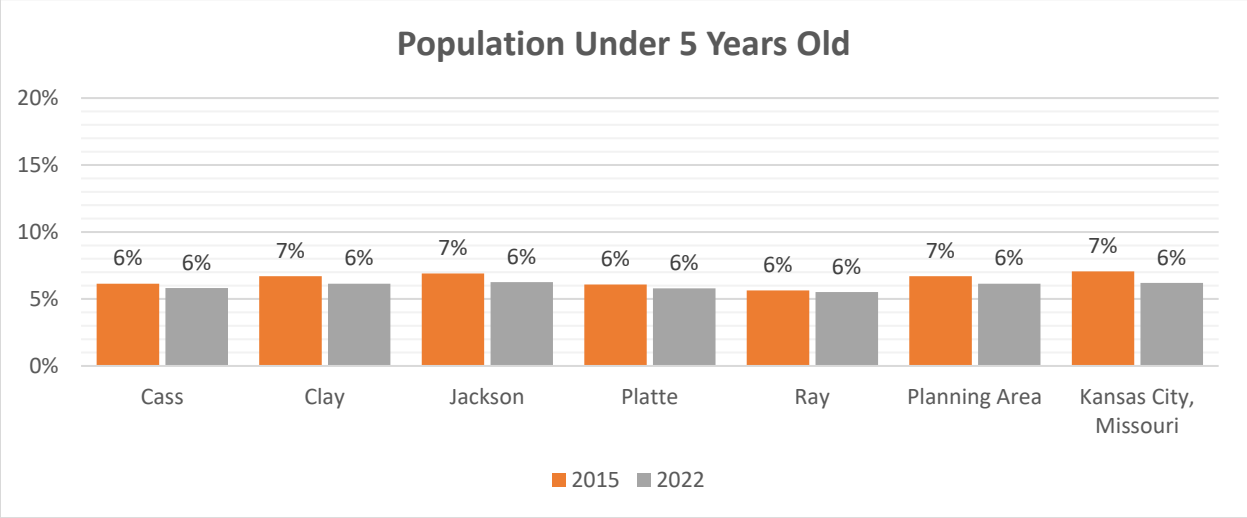
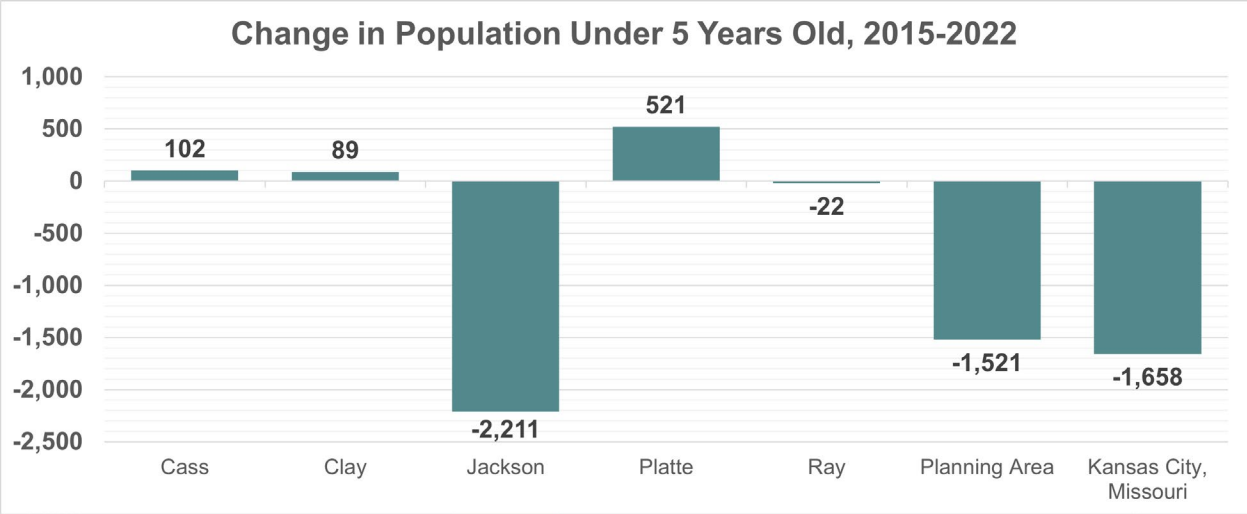


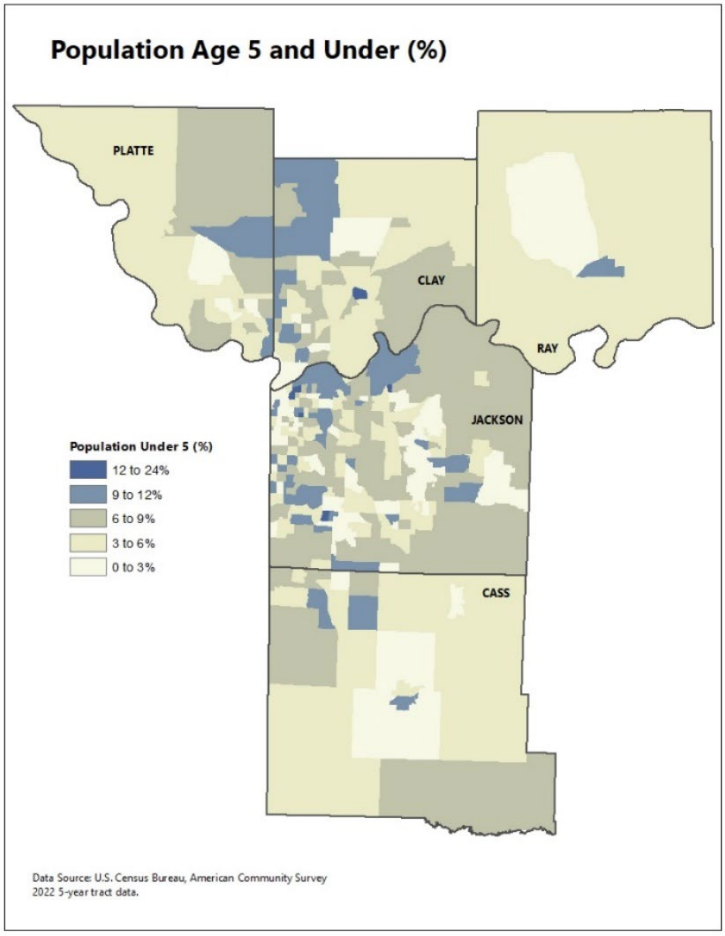
Figure 2.9: Population Under 5 Years Old
Source: US Census Bureau, 2015-2022 ACS Estimates

Young children and the elderly are among the region's most vulnerable populations. As might be expected from the planning area's median age, Clay and Jackson counties and the city of Kansas City have the higher proportion of children under the age of five, at 7.0 percent **(Figure 2.9)**. The others recorded 6.0 percent and remained unchanged over the 7-year period. However, all jurisdictions have seen a decline in their population under 5 years during the 2015-2022 period. Platte County was the only jurisdiction to see an increase during the period. **(Figure 2.10)**. Jackson County lost the largest number of young persons, decreasing by 2,211 children under the age of 5 from 2015-2022.



Source: U.S. Census Bureau, ACS Estimates 2015-2022

Figure 2.10: Change in Population Under 5 Years Old, 2015 – 2022

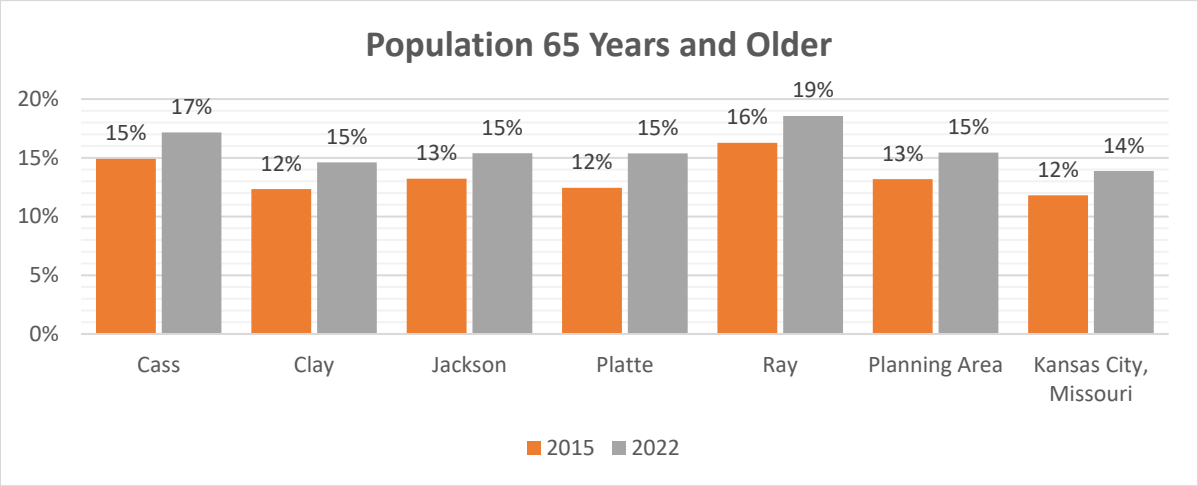


Source: US Census Bureau, American Community Survey 2022 5-year data

Figure 2.11: Population Under 5 years by Census Tract for Planning Area

The population of children under five years old grew very slowly or decreased in all counties except Platte. The overall planning area saw a decline in young children by about 1,500 over this 7-year period. This reflects the national trend of families having fewer children and older generations living longer. (Source: US Census Bureau, American Community Survey). **(Figure 2.11)**

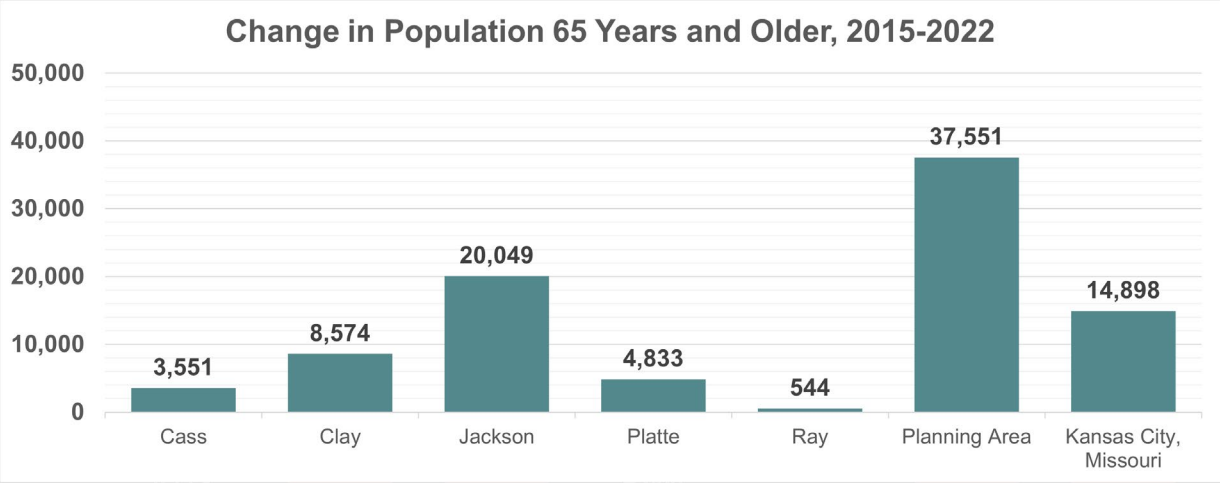
The largest concentration of young children appears to be in central and suburban Jackson County, though Cass, Clay, Platte, and Ray counties also have substantial concentrations of the population under five years of age.



Source: 2015-2022 American Community Survey, 5-year data

Figure 2.12: Percent of Population 65 Years and Older, 2015-2022 and 2017

While the more urban counties have the highest proportion of the young, it is the rural counties of Cass and Ray that have the highest proportion of older adults, with 17% and 19% residents, respectively, being 65 years or over. The five counties experienced an increase of 2 to 3 percent over the 7-year time period. **(Figure 2:12)**

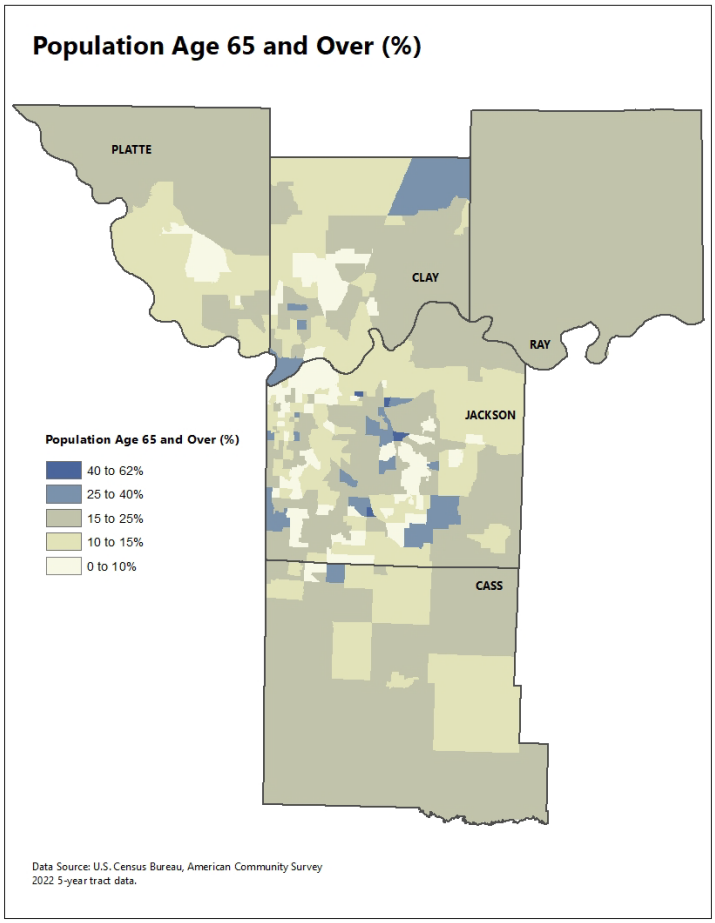


Source: U.S. Census Bureau, ACS 2015-2022

Figure 2.13: Change in Population 65 and Over, 2015-2022

In absolute numbers, Jackson County experienced the greatest increase in its senior population, adding over 20,000 older adults between 2015 and 2022. This was substantially higher than increases recorded in the other four counties. Much of the increase for Jackson County occurred in Kansas City. (Source: US Census Bureau, American Community Survey).

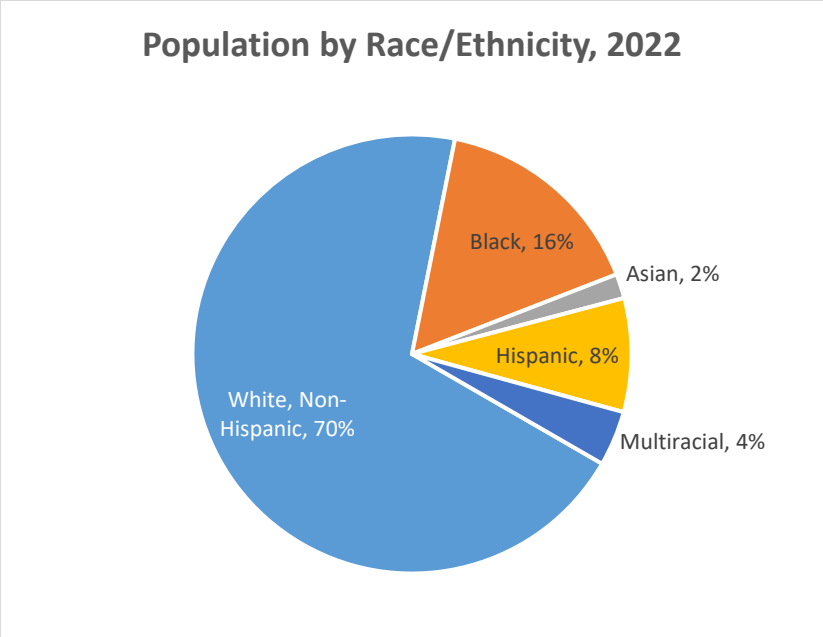
Figure 2.14: Map of Proportion of Total Population Age 65 and Over by Census Tract



Unlike young children, older adults reside throughout the five-county planning area. There are pockets of older adults concentrated in eastern Kansas City in Jackson County as well as western Independence and southeastern Jackson County. There are also concentrations of older adults in North Kansas City and near Gladstone in Clay County, northern and central Cass County, eastern Ray County, as well as some parts of northern Platte County.

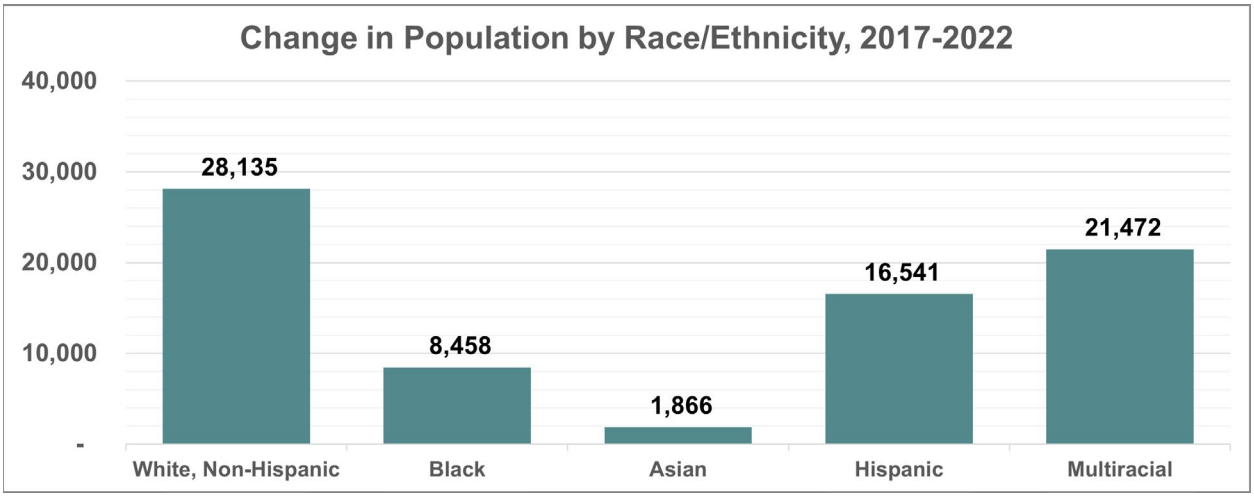
2.3.4 Population by Race and Ethnicity

The population of the Planning Area is mostly white, non-Hispanic, accounting for about 834,681 out of the 1.2 million residents, or 70 percent of the total, up 28,135 from in 2017. Black persons make up the next largest racial segment, at 16 percent of the Planning Area's population. Hispanic persons comprise eight percent of the population in the area, with Asians, multi-racial individuals, and other races comprising the remaining six percent. (Source: US Census Bureau, American Community Survey.)



Source: US Census Bureau, American Community Survey 2022

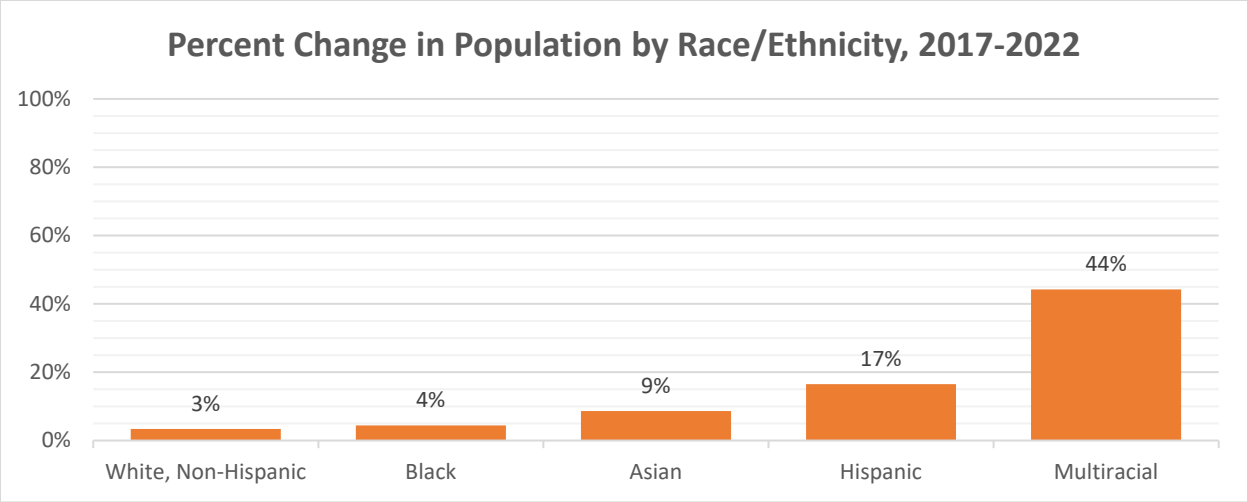
Figure 2.15: Area Population by Race/Ethnicity, 2022



Source: 2017-2022 American Community Survey, 5-year data

Figure 2.16: Planning Area's Change in Population by Race/Ethnicity

The White population grew the most out of any race or ethnic group between 2017 and 2022 in the Planning Area, adding 28,135 people. Hispanics/Latinos grew by 16,541 while Blacks grew 8,458. The multi-racial population grew the most, by 44 percent over the 7-year timeframe. **(Figures 2.16 and 2.17)**



Source: 2017-2022 American Community Survey, 5-year data

Figure 2.17: Percent Change in Population by Race/Ethnicity, 2017-2022

Forecasts of the region's population by race and ethnicity suggest that if the minority population continues to grow faster than the White population, then at some point portions of the Planning Area may become the majority minority. The Kansas City, Missouri, minority population is 45 percent of the city's total population. The area's more rural counties are the planning area's least racially and ethnically diverse. Ray County has a white non-Hispanic population of 93 percent and Cass County's is 85 percent.

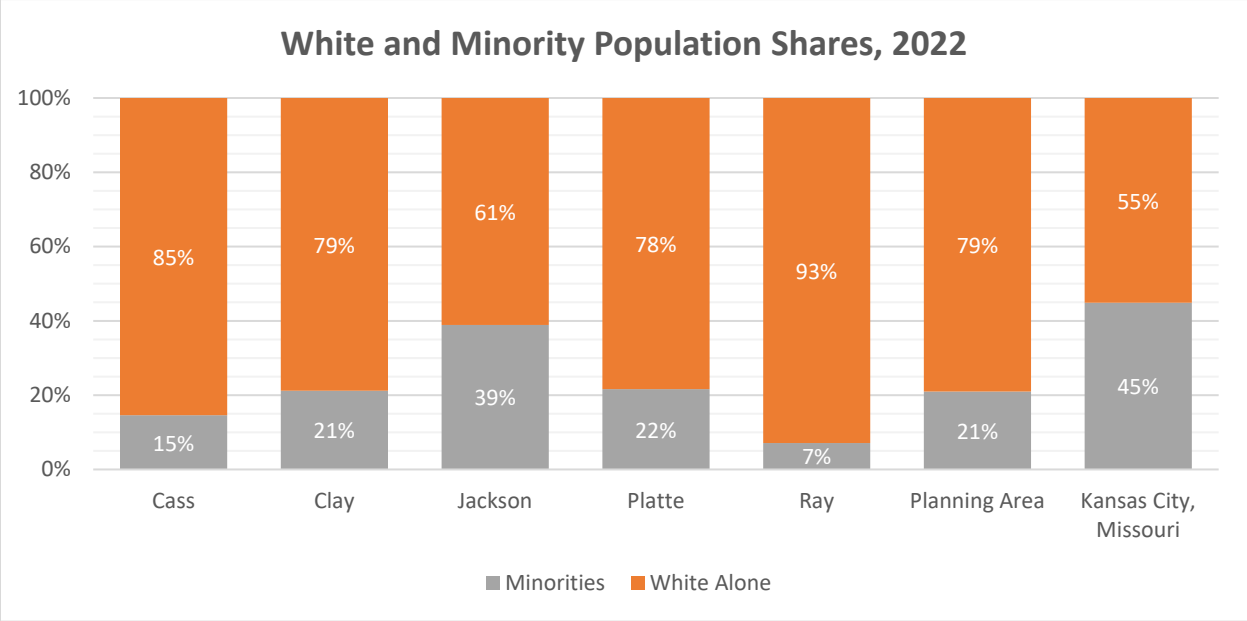
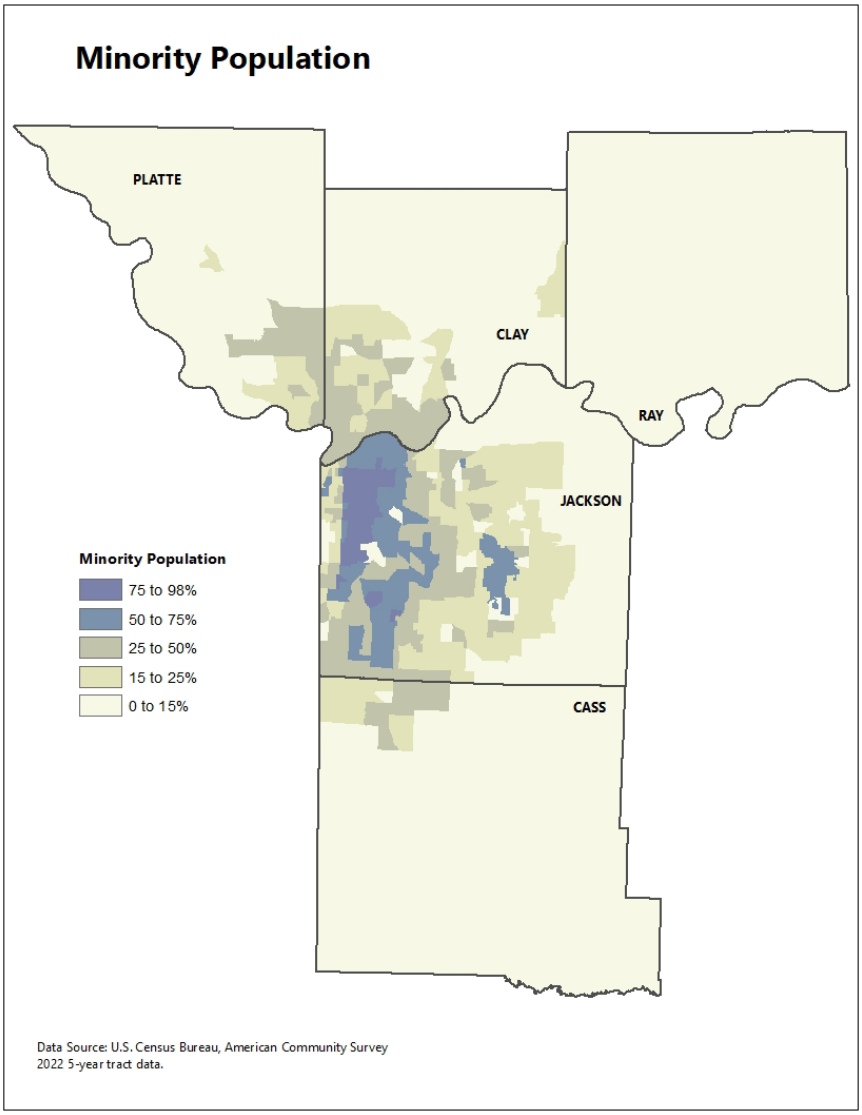


Figure 2.18: White and Minority Population Shares, 2022

While Kansas City, Missouri, has the largest concentration of persons of color, they are not spread uniformly throughout the city. The minority population, particularly the black population, is concentrated east of Troost Avenue, the historic racial dividing line due to legally sanctioned racial practices prior to the Civil Rights era. As a result of historic practices and policies, there remains a strong racial dividing line running north to south along Troost Avenue with blacks concentrated to the east of it

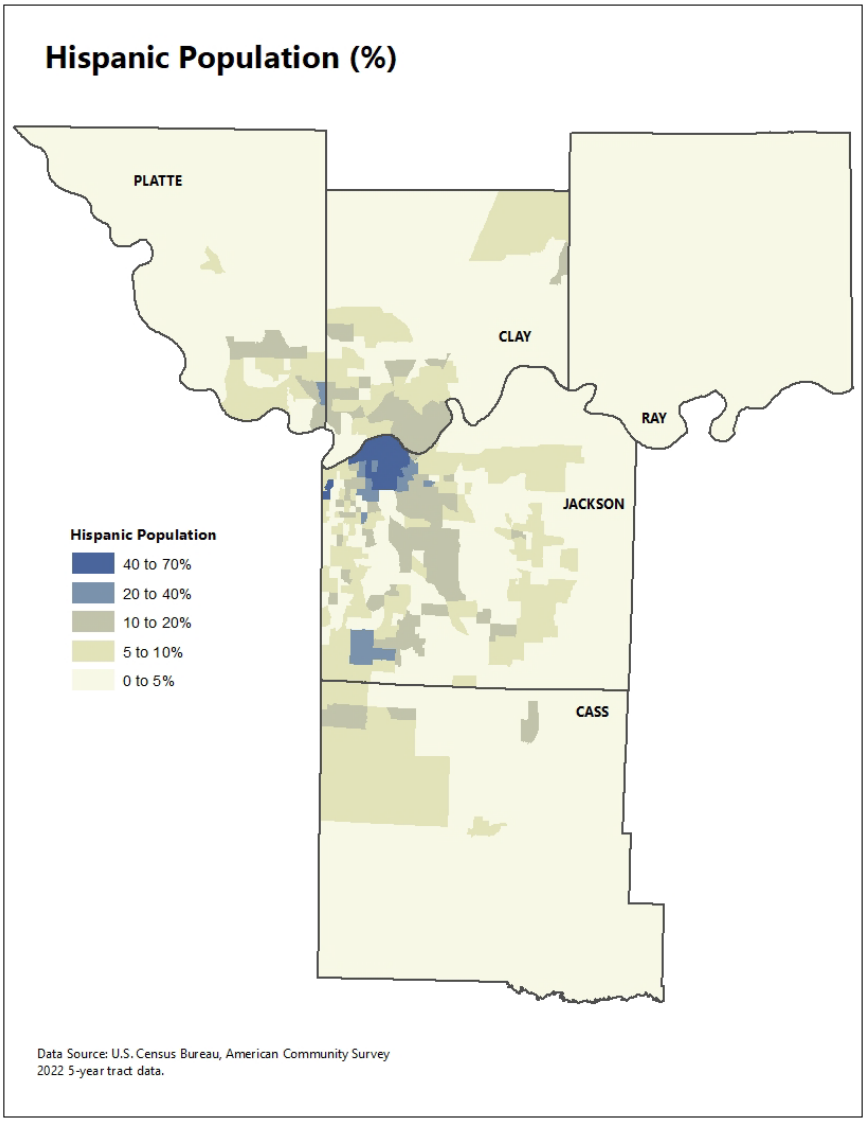
in the portion of Kansas City that is in Jackson County. The black population has grown southeast and south of the urban center, including Kansas City neighborhoods, Grandview, Lee's Summit and Blue Springs. **(Figure 2.19)**



Source: US Census Bureau, American Community Survey 2022

Figure 2.19: Minority Population 2022 (%)

While the majority of persons of color in central portion of Kansas City is largely Black, Hispanic persons are more dispersed, with some concentrations on the westside of downtown, in the northeast Kansas City area, Kansas City north and, to a lesser extent, to the south in Grandview and northern Cass County.



Source: US Census Bureau American Community Survey 2022

Figure 2.20: Hispanic Population 2022 (% of Persons by Census Tract)

The Planning Area has a growing Hispanic population, and while those persons who have moved to the region over the past five years tend to have greater language barriers, many long-time Hispanic residents speak both languages well. **(Figure 2.20)** The most prevalent language spoken in the planning area other than English is Spanish. Only 5% of Kansas City, Missouri's population does not speak English well. **(Figure 2.21)**

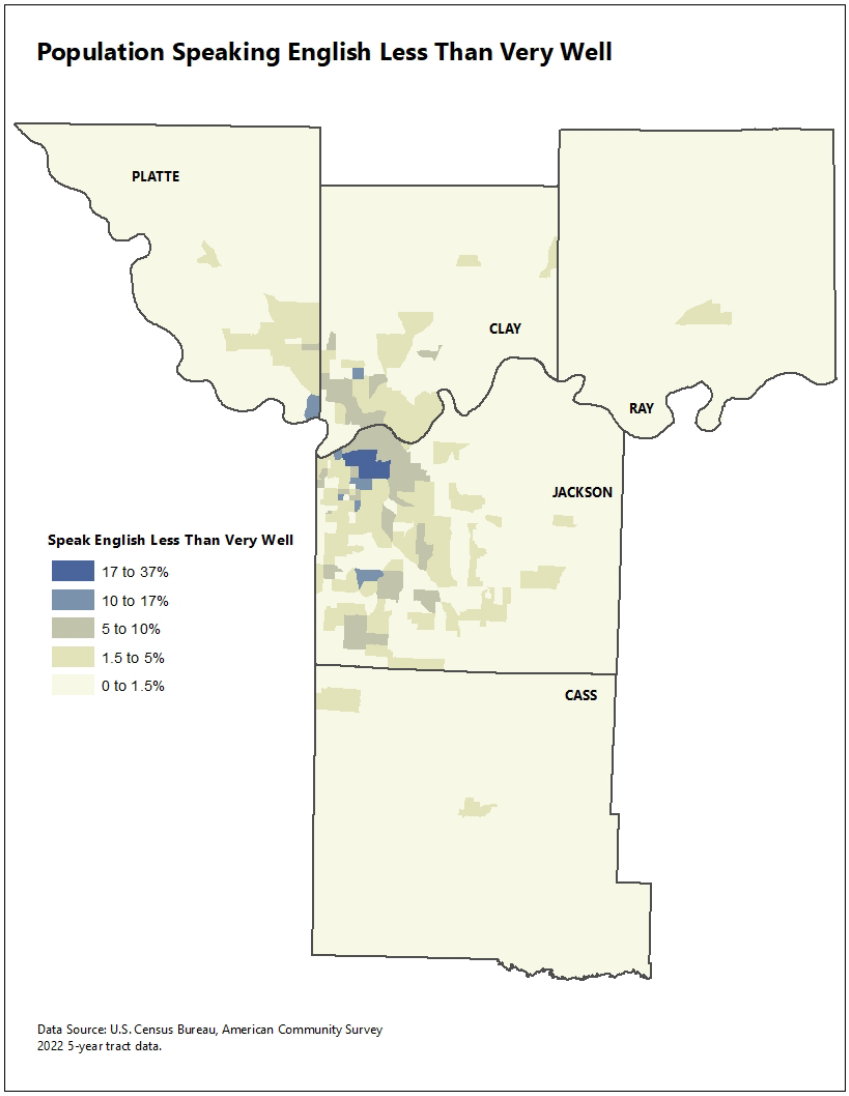
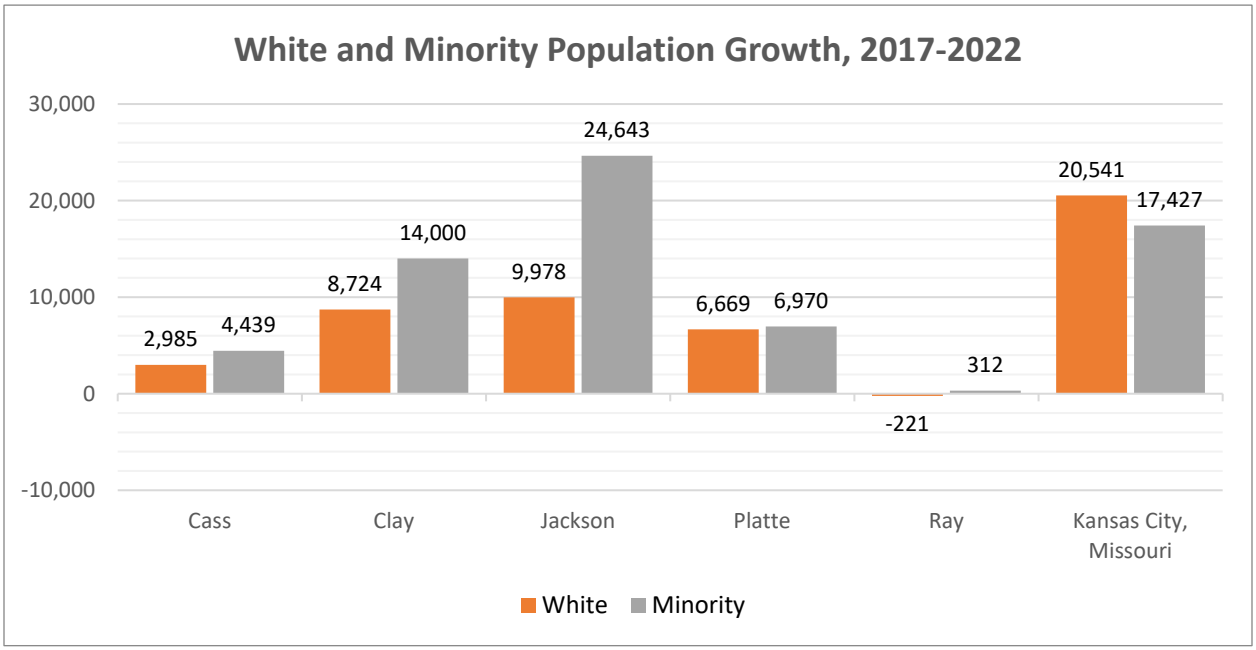


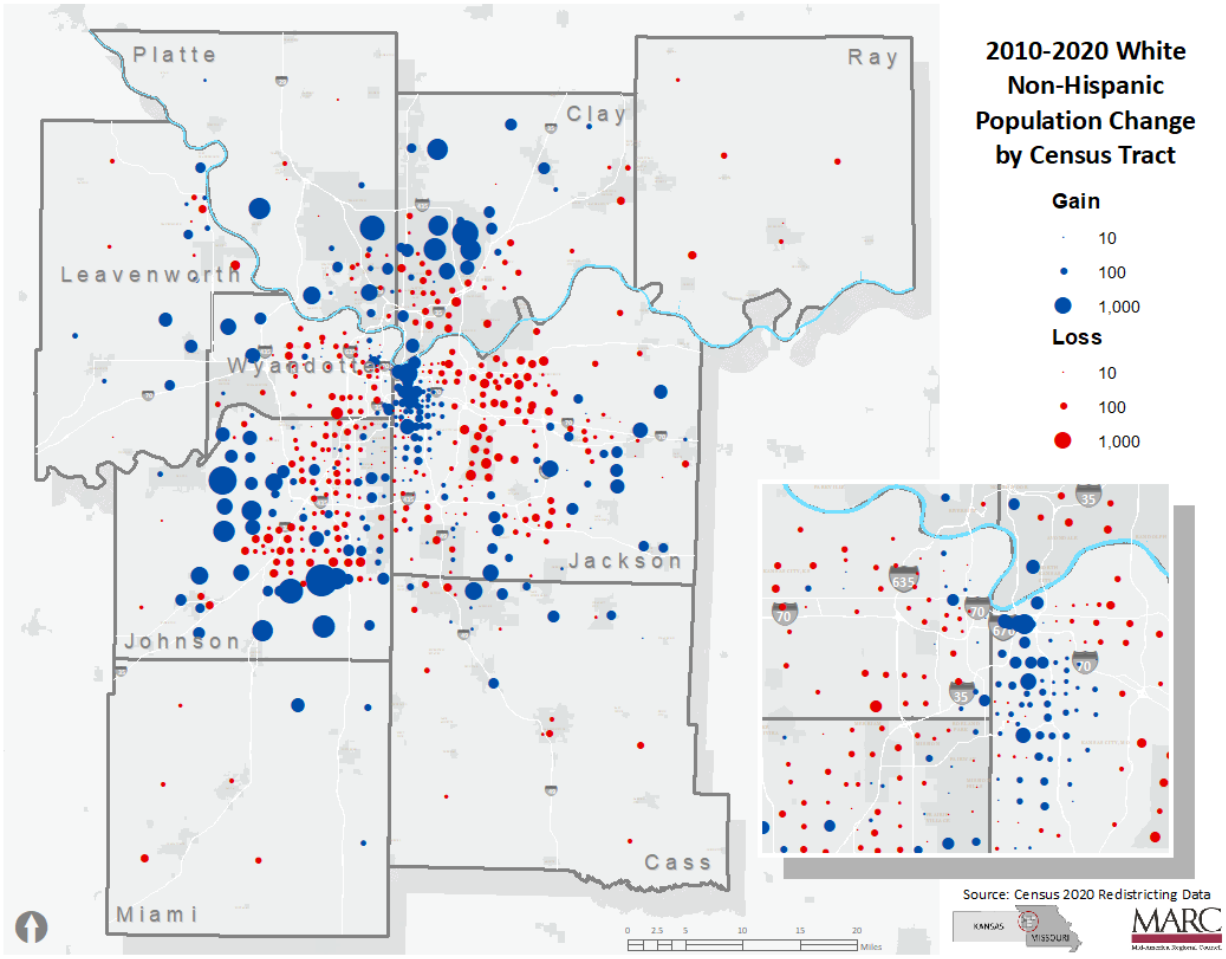
Figure 2.21: Population Speaking English Less than 'Very Well'
(% of Hispanic Persons by Census Tract)



Source: 2017 and 2022 American Community Survey, 5-year data

Figure 2.22: White and Minority Population Growth, 2017-2022

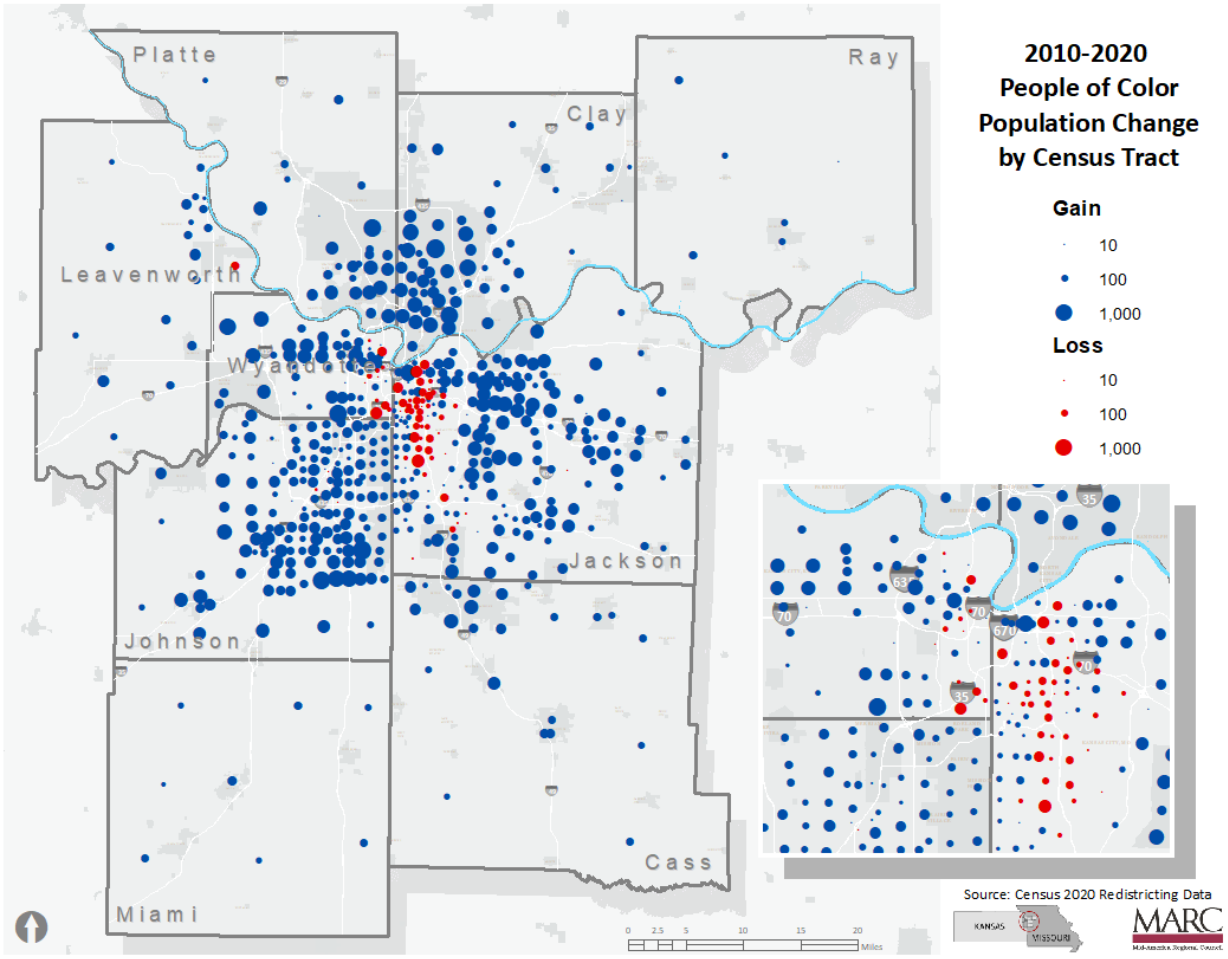
Overall, the white population growth was smaller in comparison with minorities between 2017 and 2022. Jackson County's minority population grew the most among the 5 counties. All of the counties had more growth in their minority population than their white population. In Jackson County, minorities accounted for around 80 percent of the population growth. The city of Kansas City saw a majority of their population growth come from white persons, given that much of their population growth occurred in Clay and Platte counties. **(Figure 2.22)**



Source: Census Bureau, 2010 and 2020 decennial censuses

Figure 2.23: Change in White Non-Hispanic Population 2010-2020

The county and large city totals mask the underlying dynamics of population shifts in the Planning Area. The area where minorities are most concentrated is also the area of Kansas City experiencing population loss. Similar to whites in previous generations, minorities are also moving outward in search of better opportunities for jobs and housing, safer neighborhoods and better schools. As a result, suburbs have experienced increasing racial and ethnic diversity (US Census Bureau, Decennial Census). **(Figures 2.23 and 2.24)**



Source: Census Bureau, 2010 and 2020 decennial censuses

Figure 2.24: Change in Minority Population, 2010-2020

2.3.5 Poverty

There is a correlation between concentrations of persons of color and concentrations of poverty. In part, population loss is the result of the loss of households or a reduction in household size. Population loss may also be correlated with an increase in the number of vacant dwellings in urban core neighborhoods or non-residential reinvestment in areas. Some urban core neighborhoods could have experienced population loss while also showing reinvestment.

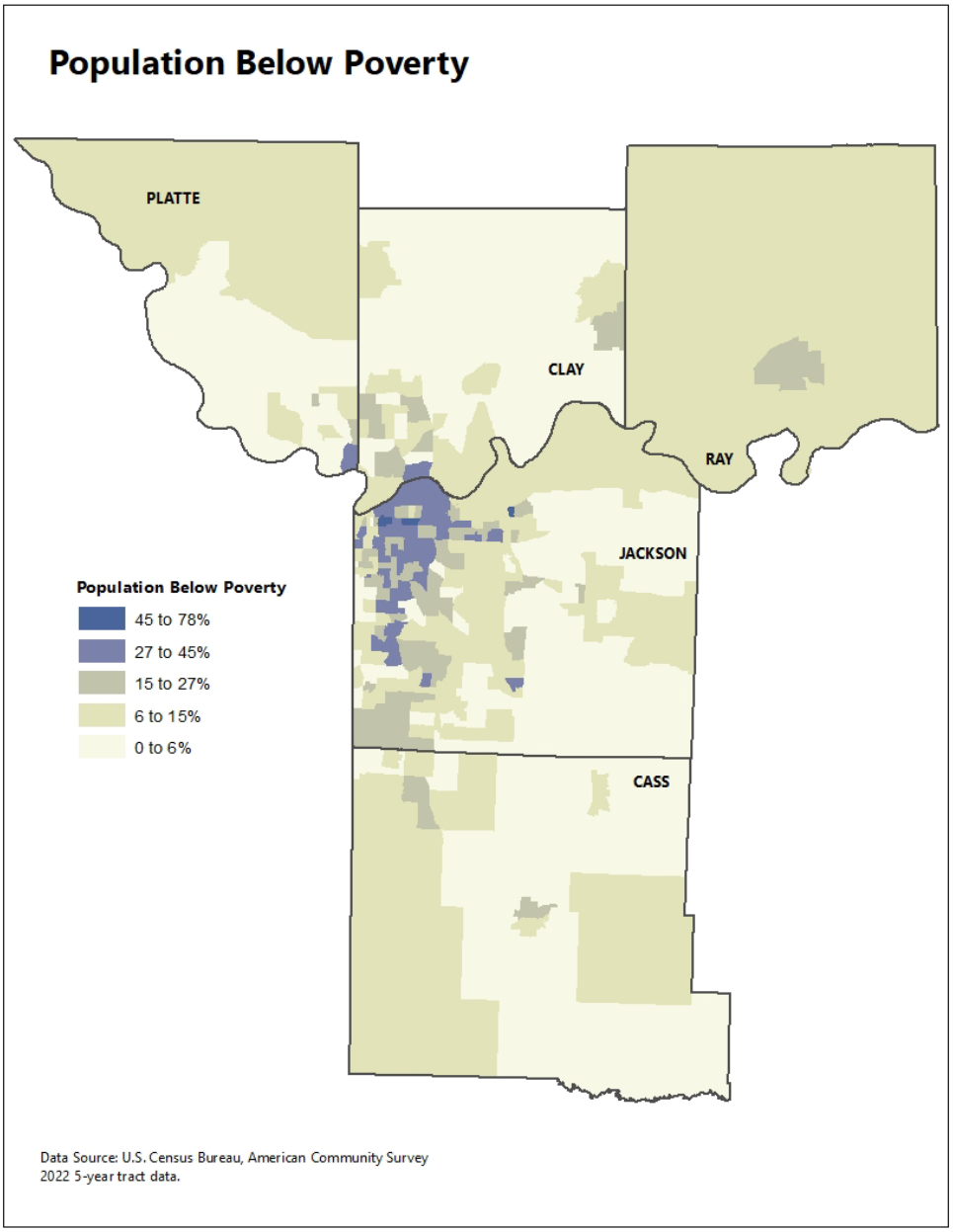


Figure 2.25: Population Below Poverty (% of Persons by Census Tract)

Almost every city and county in the Kansas City region has residents with low incomes, although greater concentrations of poor households are found in older, urban core neighborhoods. Many households on limited incomes live in homes that pose risks related to health due to particulate and lead exposures, as well as inadequate or expensive heating and cooling systems.

Table 2.2 Persons in Poverty by County, 2015 and 2022

	2015		2022		Change	
COUNTY	Total Population	Population Below Poverty	Total Population	Population Below Poverty	Total Population	Population Below Poverty
Cass	101,389	9.9%	108,205	7.0%	7,424	-2.9%
Clay	235,344	8.8%	253,085	8.3%	22,724	-0.6%
Jackson	687,182	17.9%	715,526	13.9%	34,621	-4.0%
Platte	96,552	7.7%	107,033	7.0%	13,639	-0.7%
Ray	22,799	15.9%	23,122	12.2%	91	-3.7%
Planning Area	1,143,266	12.0%	1,206,971	9.6%	78,499	-2.4%
Kansas City, MO	475,368	19.0%	505,958	14.9%	37,968	-4.1%

Source: US Census Bureau, American Community Survey 2015 and 2022

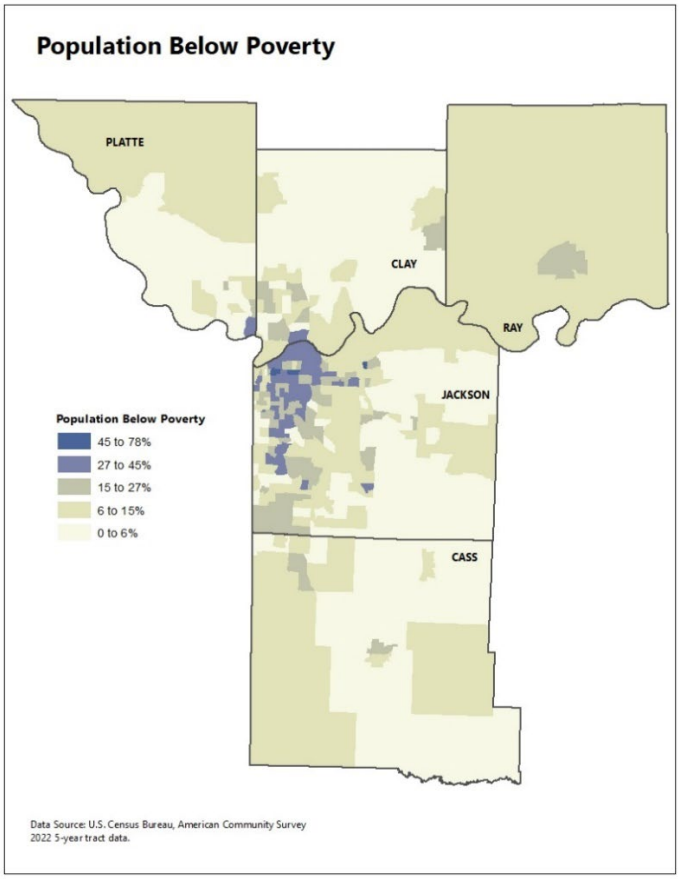


Figure 2.26: Change in Population Below Poverty, 2000-2010

Growth in the economy and support from COVID-19 resources resulted in a drop in the population in poverty between 2017 and 2022. Poverty remains the most concentrated in the Jackson County portion of Kansas City where the population in poverty dropped by almost 25,000 over the 7-year period. Clay and Platte counties experienced modest increases of persons in poverty. The percentage of persons in poverty dropped in the planning area from 12% of total persons in 2017 to 9.6% in 2022. Jackson and Ray counties had the largest decline of persons in poverty, 4% and 3.7%, respectively.

Many aspects of population vulnerability are highly correlated with poverty, including unemployment, low levels of education, living in households with no vehicles, and not having health insurance. While other vulnerable populations are more spread throughout the Planning Area, including the disabled and veterans, many of these populations have lower incomes.

Maps 2.68 to 2.71 showing the location of these vulnerable populations may be found at the end of this section.

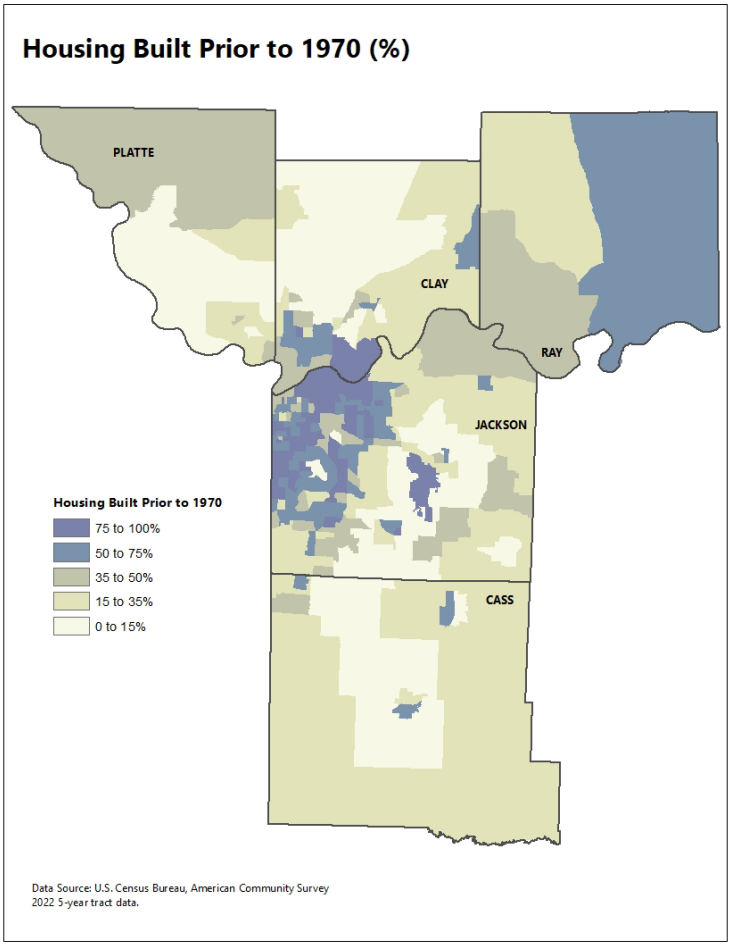


Figure 2.27: Housing Units Built before 1970 (%)

Households with limited incomes often reside in neighborhoods with older housing units. However, age of housing is not always an indicator of household wealth. **Figure 2.27** shows those areas with larger proportions of housing units that were built prior to 1970.

The Planning Area (and the entire Kansas City metro region) has seen a sizable increase in the number of multi-unit buildings over the past decade. As the value and sales price of single-family properties has increased and interest rates for mortgages has gone up, the rate of homeownership in the region has fallen. In addition to the increasing costs of properties and mortgage interest rates, institutional buyers have entered the Kansas City marketplace offering cash for properties, further reducing the supply of housing for homeownership.

Table 2.3: Housing Units by Occupancy: 2022

County	Owner	Renter	Vacant
Cass	31,622	9,902	2,489
Clay	67,850	31,651	6,070
Jackson	174,963	123,945	31,676
Platte	28,301	14,305	2,772
Ray	6,889	1,884	1,105
Planning Area	**309,625**	**181,687**	**44,112**

Source: US Census Bureau American Community Survey 2017-2022

The planning area's housing stock data showed 535,424 in 2022, with 48.3% owner-occupied, 41.2% renter-occupied and 10.5% vacant.

2.4 Planning for the Future

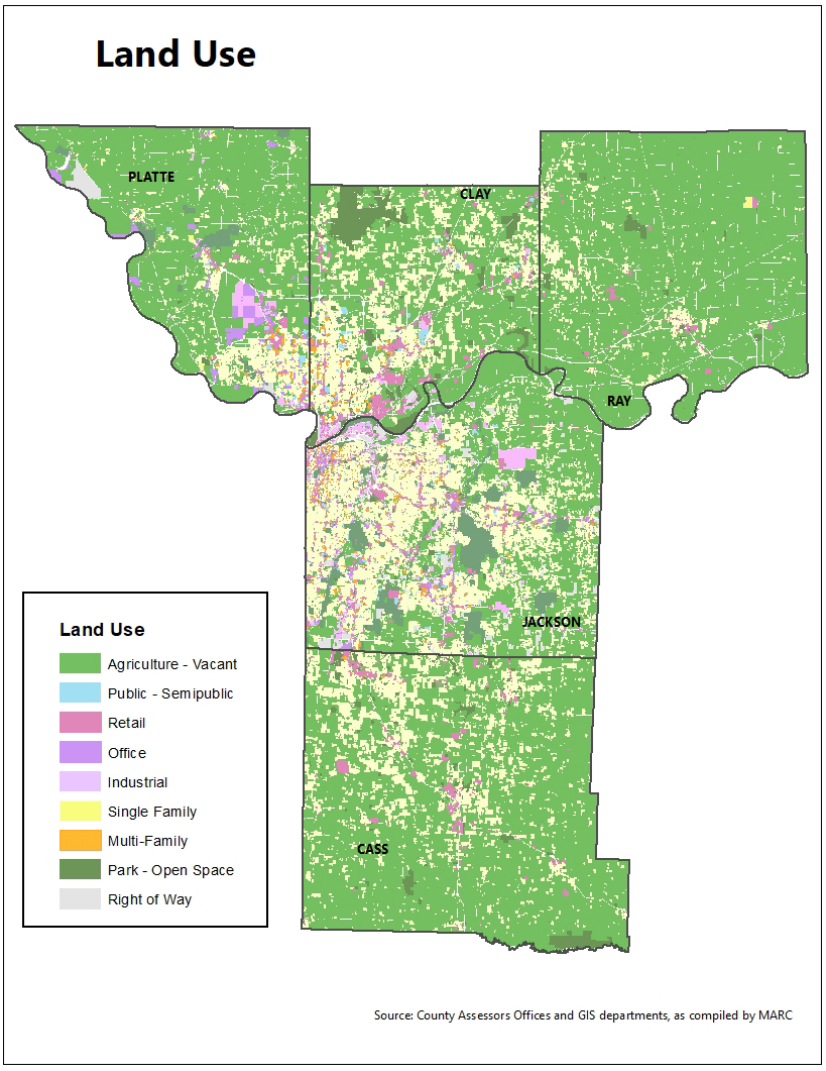
2.4.1 Land Use

As the Kansas City region's Metropolitan Planning Organization (MPO), MARC makes land use forecasts as an input into the region's long-range transportation plan. MARC forecasts population and employment growth by first forecasting land use change, then applying planned densities to those changes. This process begins with the distribution of development as given by the region's current land use (Source: MARC).

Table 2.4: Existing Land Use by Major Type, in acres

Land Use	Cass	Clay	Jackson	Platte	Ray	Planning Area
Single Family	38,740	42,997	71,188	22,316	10,537	185,779
Multi-Family		2,396	6,192	1,585		10,173
Commercial	5,857	7,818	8,875	1,791	2,242	162
Mixed Use			104	58	-	91,858
Office		542	3,784	10,958	-	15,284
Industrial/Business Park		2,820	15,576	5,272		50,110
Public/Semipublic	14,999	30,964	9,917	2,998	4,864	29,324
Parks and Open Space		787	30,176	5,730	-	36,693
Vacant or Agricultural	380,377	144,698	188,818	199,444	332,961	1,246,299
Other		2,567	16,111	4,129	4	22,811
Total	**439,974**	**235,589**	**350,743**	**254,281**	**350,607**	**1,631,194**

Source: County Assessors Offices and GIS departments, as compiled and tabulated by MARC



Source: County Assessors Offices and GIS departments, as compiled and tabulated by MARC

Figure 2.28: Area Land Use

Vacant or agricultural land is still the dominant land use in the Planning Area, comprising two-thirds of the total land area. Adding parks and open space to this total, more than three-quarters (78 percent) of the Planning area is undeveloped. This varies by county, from Ray and Cass counties, with 96 percent and 88 percent undeveloped, respectively, to Jackson County, with 56 percent undeveloped.

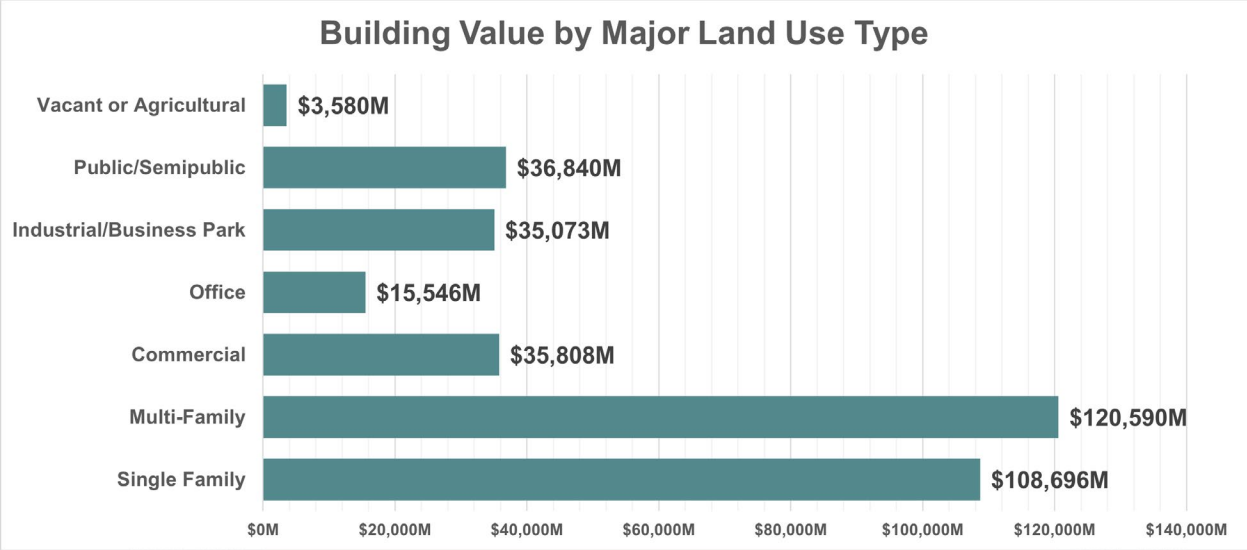
Among the land devoted to developed uses in the Planning Area, single-family residential areas comprise half of it, and right-of-way—principally for roads—make up another quarter. Public/semi-public facilities, such as Kansas City International Airport (KCIA), city halls, schools and churches, sit on nine percent of the developed land, while commercial areas consume six percent, as do office/warehouse parks and industrial areas. The highest density uses take up the least amount of land, as multifamily and office uses comprise only two percent and one percent of the developed land area, respectively. **(Figure 2.28)**

Given its relative share of developed land uses, single-family homes dominate the structure count, comprising 86 percent of the total structures in the Planning Area **(See Table 2.5).**

Table 2.5: Building Counts by Major Land Use Type						
Land Use Type	**Cass**	**Clay**	**Jackson**	**Platte**	**Ray**	**Total**
Single Family	53,159	86,657	259,396	35,470	19,207	453,889
Multi-Family	86	6,894	18,367	3,767		29,114
Commercial	2,002	2,654	6,571	822	527	12,576
Office		509	3,057	590		4,156
Industrial/Business Park	3	989	5,054	749		6,795
Public/Semipublic	1,013	1,993	3,668	545	466	7,685
Vacant or Agricultural	773	622	8,624	917	398	11,334
Total	**57,036**	**100,318**	**304,737**	**42,860**	**20,598**	**525,549**

Source: City and County GIS departments and MARC 2023 estimates

The share of total building value attributed to single family structures drops to 30.5 percent. Multi-family buildings comprise 33.9 percent of the building value in the planning area. This is followed by the value of buildings in commercial (other than office), public/semi-public and industrial at about 10 percent each. Over half (51.1%) of the Planning Area's building value is in Jackson County. (**Figure 2.29 and Table 2.6)**



Source: County assessors, city and county Planning and GIS departments, as compiled and tabulated by MARC.

Figure 2.29: Building Value by Major Land Use Type

Table 2.6: Building Value by Use Type						
Building Type	**Cass**	**Clay**	**Jackson**	**Platte**	**Ray**	**Total**
Single Family	$13,795,778,240	$21,042,203,300	$3,057,593,611	$8,617,341,255	$2,183,039,200	$108,695,955,606
Multi-Family	$21,408,810	$39,283,782,900	$47,646,743,692	$33,638,101,648		$120,590,037,050
Commercial	$1,485,674,940	$13,301,612,600	$15,597,872,868	$5,297,656,848	$125,562,300	$35,808,379,556
Office	$-	$706,655,800	$11,226,156,092	$3,612,725,098		$15,545,536,990
Industrial/ Business Park	$74,607,170	$2,317,910,200	$18,201,925,828	$14,478,439,788		$35,072,882,986
Public/Semipublic	$871,134,670	$8,855,844,800	$23,070,990,830	$4,038,217,919	$3,399,010	$36,839,587,229
Vacant or Agricultural	$66,879,435	$132,622,570	$3,286,834,026	$81,182,940	$12,022,630	$3,579,541,601
Total	**$16,315,483,265**	**$85,640,632,170**	**$182,088,116,947**	**$69,763,665,496**	**$2,324,023,140**	**$356,131,921,018**

Source: County assessors, city and county planning and GIS departments, as compiled and tabulated by MARC.

2.4.1a Planned Land Use

After collecting existing land use, MARC surveys cities and counties to obtain their future land use plans. Typically, these plans are designed to visualize what the jurisdiction will look like once it is fully built-out or, in older areas, when anticipated redevelopment is completed. As such, these plans provide guidance for MARC's forecast concerning what kinds of development will occur and where, provided there is sufficient demand to make the development economically feasible **(See Table 2.7).**

Table 2.7: Planned Land Use by Major Type, in acres						
Land Use (in acres)	**Cass**	**Clay**	**Jackson**	**Platte**	**Ray**	**Total**
Single Family	46,358	58,094	129,236	36,639	10,605	280,932
Multi-Family	2,741	7,998	14,128	5,867	5	30,739
Mixed use	46,649	34,035	10,120	3,526		94,331
Commercial	8,238	4,419	10,574	2,508	1,839	30,629
Office	985	1,001	3,040	411		5,436
Industrial/Business Park	7,426	13,558	21,830	9,461	30	52,304
Public/Semipublic	2,329	4,815	6,746	11,641	4.980	30,511
Parks and Open Space	4,615	18,437	38,156	8,887		70,096
Vacant or Agricultural	312,194	92,950	116,316	175,099	333,146	1,029,705
Other	8,439	281	597	32	3	9,353
Total	**449,514**	**350,743**	**254,281**	**350,607**		**1,631,194**

Source: City and County Planning and GIS departments, as compiled and tabulated by MARC.

Planned land use maps in local land use plans are not as precise as the data for existing land use, so most of the land in right-of-way is classified according to its surrounding land use. The planned land use map **(Figure 2.30)** shows that local governments expect most of the planning area's vacant and agricultural land to be developed as single-family housing at some point in the future. Given that the population in the Kansas City region is only projected to grow by 17.5 percent between 2020 and 2050 indicates that suburbanization trends are expected to continue with new development on green field sites but at a slower rate during the 30-year planning horizon.

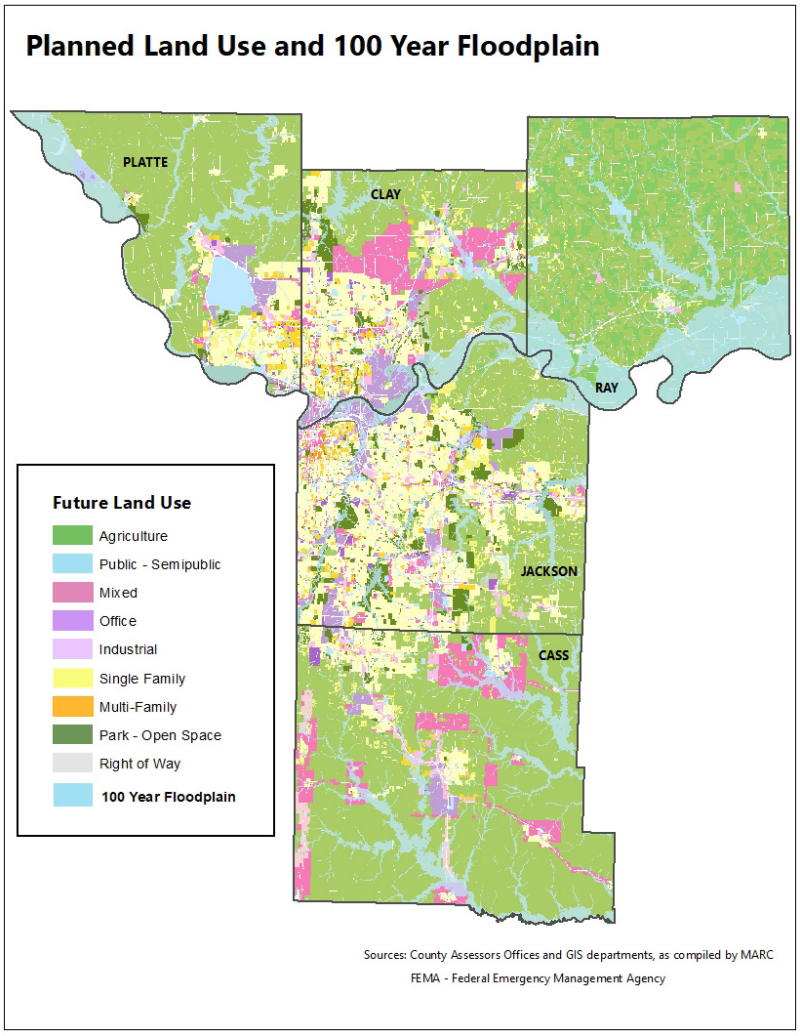


Figure 2.30: Planned Land Use with 100-Year Floodplain

To forecast where development is expected to occur between 2020 and 2050, given the vast quantity of land where growth could theoretically occur, MARC uses a series of statistical models to estimate the land most likely to develop. These history-based probabilities are augmented with information concerning local priorities for development that jurisdictions are encouraging with policies, investments and incentives. In general, local plans exclude future development from flood plains, so no new growth is forecast there.

Additionally, most local governments plan to focus future development in activity centers **(Figure 2.31)** along transportation corridors to increase walkability, better serve growing senior population, and make growth more affordable by limiting infrastructure extensions (Source: MARC information from local land use plans).

Source: MARC

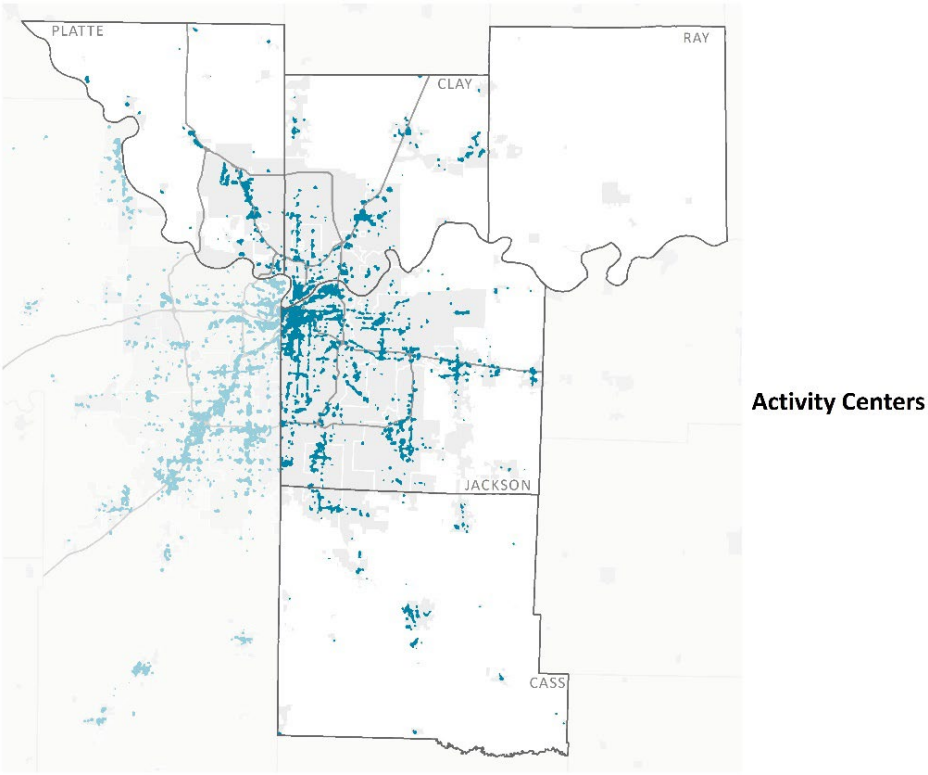
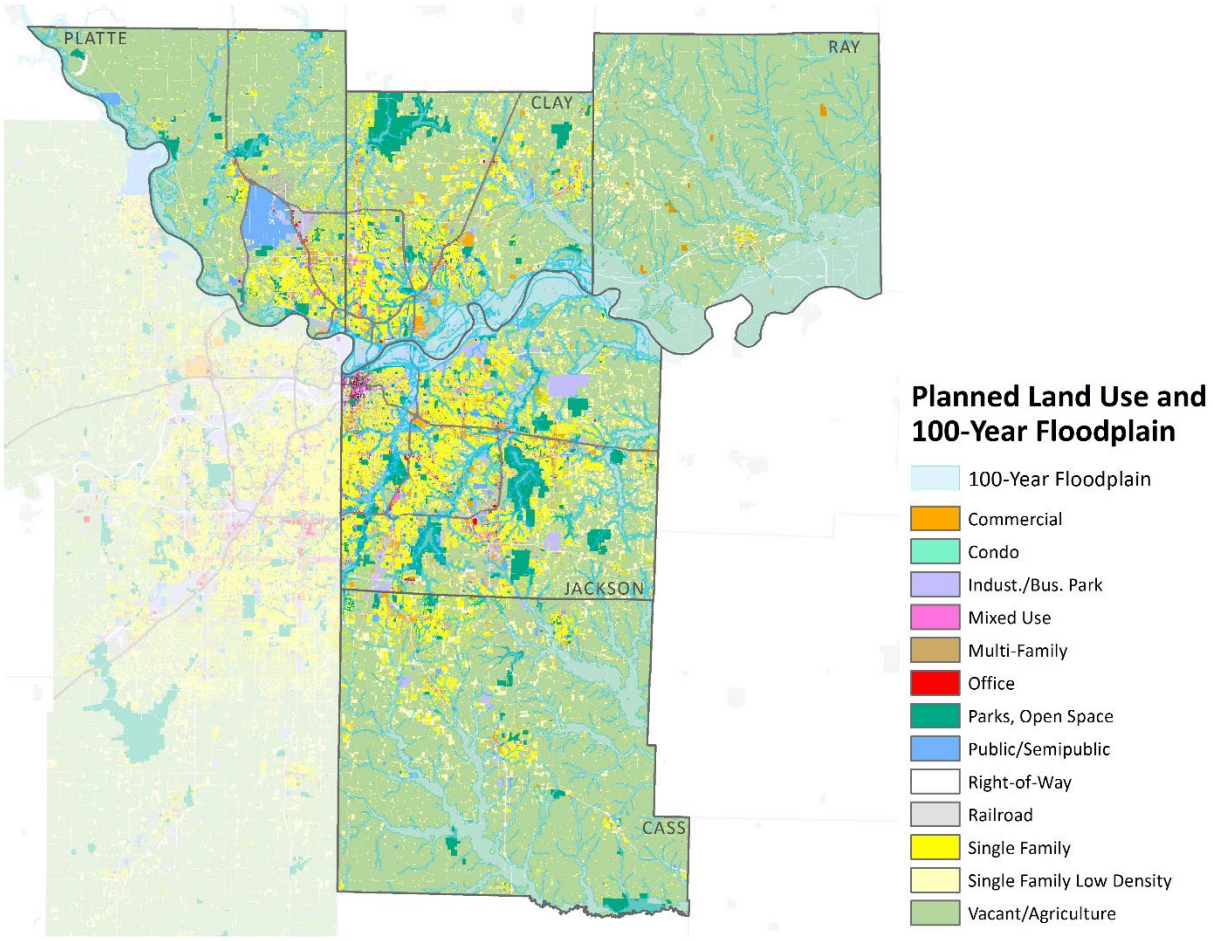


Figure 2.31: Planning Area Activity Centers

2.4.1b Land Use Forecast

Future land use is forecast based on 1) the expected growth in total population and employment, 2) the probability a given parcel of land will newly develop, redevelop, or decline based on existing land use and historical trends, and 3) current local land use policy and public investments designed to focus growth where it can be most efficiently and successfully accommodated. These forecasts also include as a policy that no new development will occur in floodplains (Source: MARC).

As a result, most new development **(Figure 2.32)** is projected to occur adjacent to or near existing development, especially along existing transportation corridors and in existing or planned activity centers.



Source: MARC

Figure 2.32: Forecast Future Land Use with 100-Year Floodplain

2.4.2 Population Forecasts

This future land use forecast is then converted to a population and employment forecast by applying the planned densities, along with expected persons per household and employees per square foot, to the forecast land use. When aggregated to a county level, Clay County is forecast to experience the greatest population growth, adding more than 106,000 people between 2010 and 2040, while Platte County is expected to grow the fastest, increasing its population by 57 percent over the period, a gain of some 51,000 people. Jackson County will remain the planning area's largest county, adding about 68,000 people—second most in the planning area—to reach 742,000 by 2040, a 10 percent increase over 2010 levels. Cass County is expected to add 41,000 people during the 30-year period, an increase of 41 percent. Population forecasts were not available for Ray County in the MARC 2040 Forecast and American Community Survey sources. The 2020 forecast listed for Ray County is the current 2018 population to show change over a period. Combined, the planning area's population is forecast to grow by more than one-quarter million by 2040, a 24 percent increase over its population in 2010. **(See Table 2.8)**

Table 2.8: Population Forecast					
County/Area	2020	2030	2050	2020-2050 Change	2020-2050 % Change
Cass	107,743	116,637	132,986	25,242	23%
Clay	253,124	273,108	306,074	52,954	21%
Jackson	716,641	763,275	814,324	97,665	14%
Platte	106,614	122,234	146,244	39,628	37%
Ray	23,142	21,922	21,227	-1,916	-8%
Planning Area	1,207,263	1,297,176	1,420,854	213,573	18%
Planning Area Share	57%	58%	58%	0.1%	0.2%
MARC Region	2,101,548	2,249,167	2,469,120	367,571	17%

Source: Census Bureau, MARC.

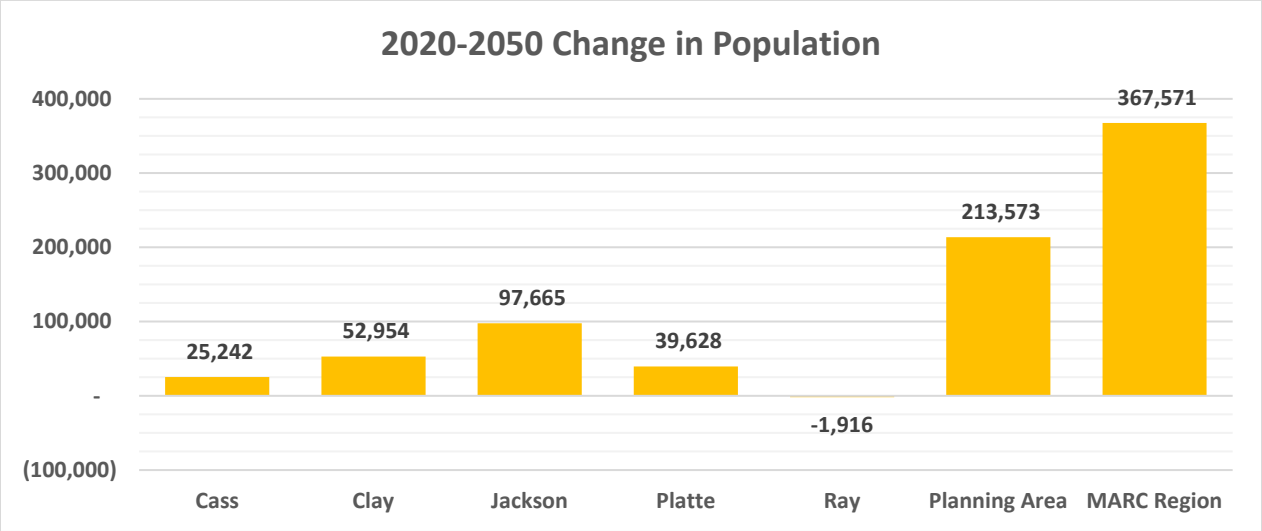


Figure 2.33: Population Forecasts 2020-2050 Source: Census Bureau, MARC

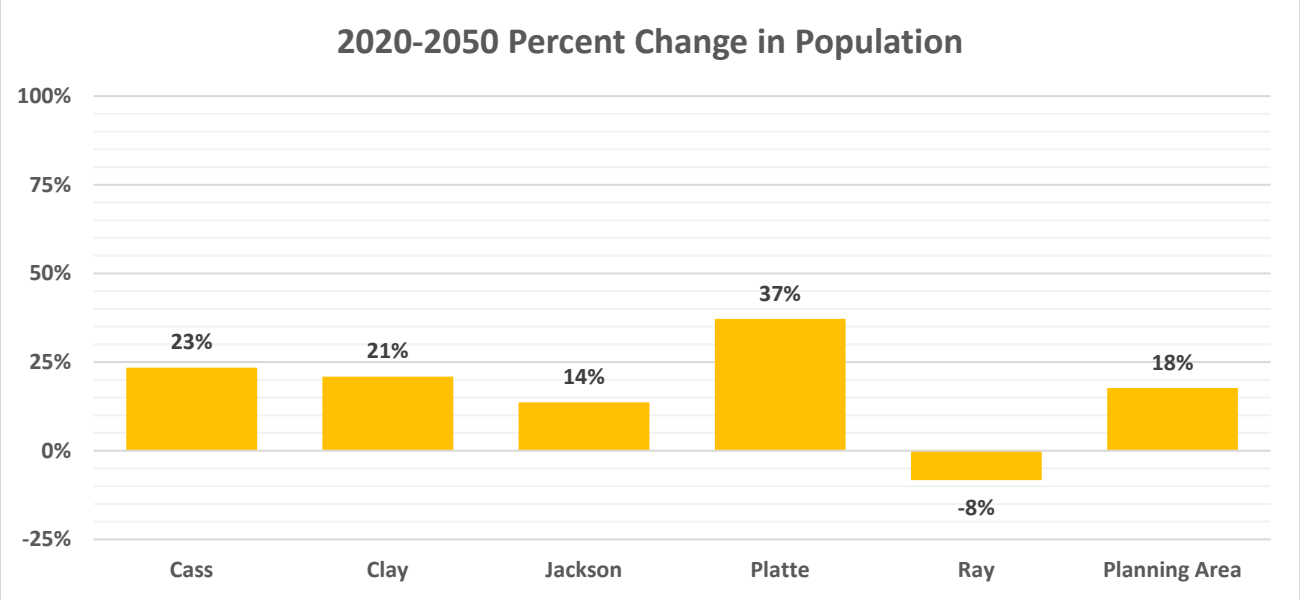


Figure 2.34: Population Forecasts Percent Change 2020-2050 Source: Census Bureau, MARC

The city of Kansas City population in households is expected to grow by 72,385 people between 2020 and 2050, a 14.5 percent increase**.** Most of its growth will be concentrated in the Northland—i.e., the portions in Clay and Platte counties, which lie north of the Missouri River. Besides Kansas City, Liberty, Kearney, Smithville, Gladstone and Parkville are expected to experience population growth over the period. In Jackson County, the urban core portions of Kansas City are forecast to continue to decline, albeit at reduced rates compared to historical trends. This decline is partially offset by the continued redevelopment in and around downtown Kansas City, MO. Most of the growth in Jackson County, however, is concentrated in the eastern portions, particularly in Independence, Lee's Summit and Blue Springs and, to a lesser extent, Grandview. In Cass County, population growth is expected to continue to be concentrated in its northern tier of cities – Belton, Raymore, Peculiar and Pleasant Hill. However, Harrisonville is also expected to see population growth between 2020 and 2050 **(Figure 2.35)**.

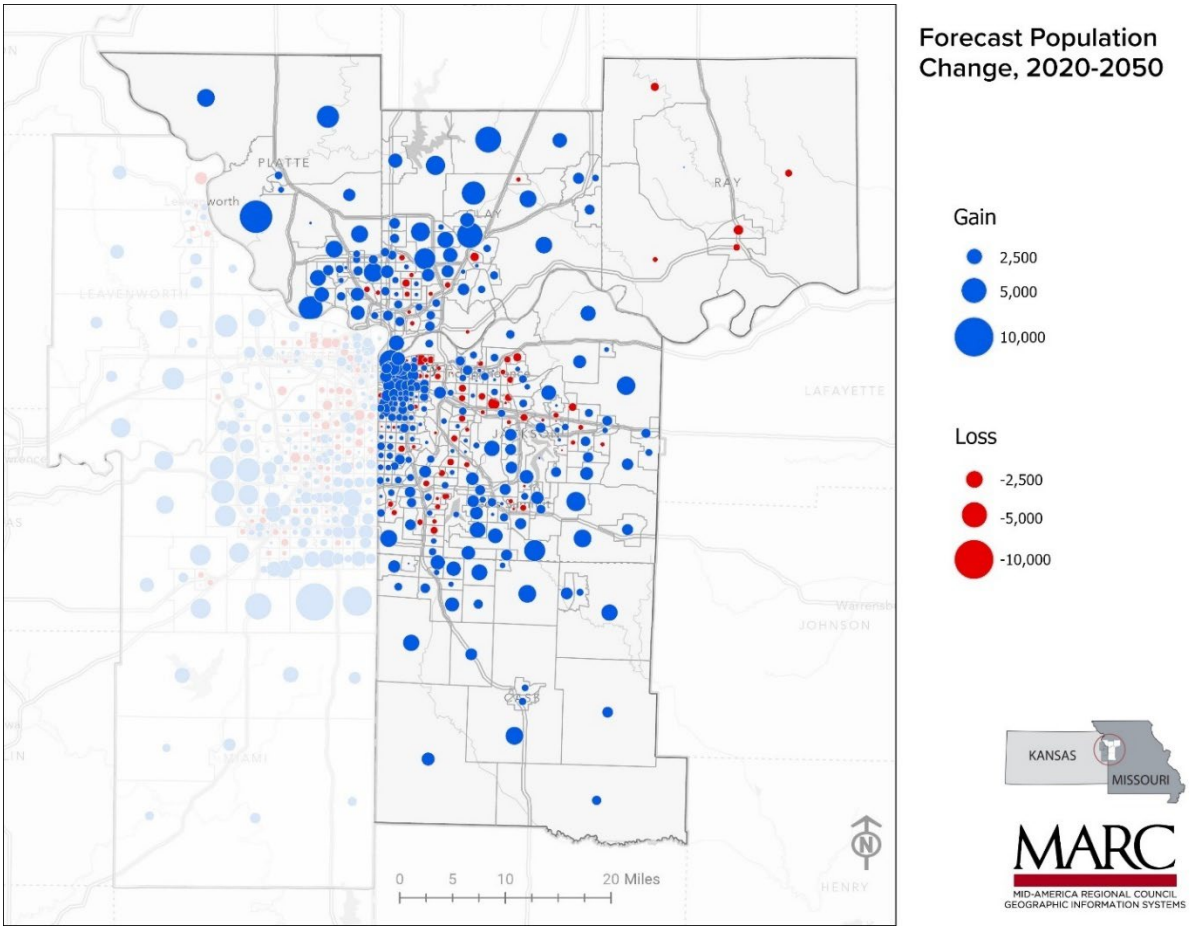


Figure 2.35: Population Forecast 2020 – 2050 by Census Tract. Source: MARC

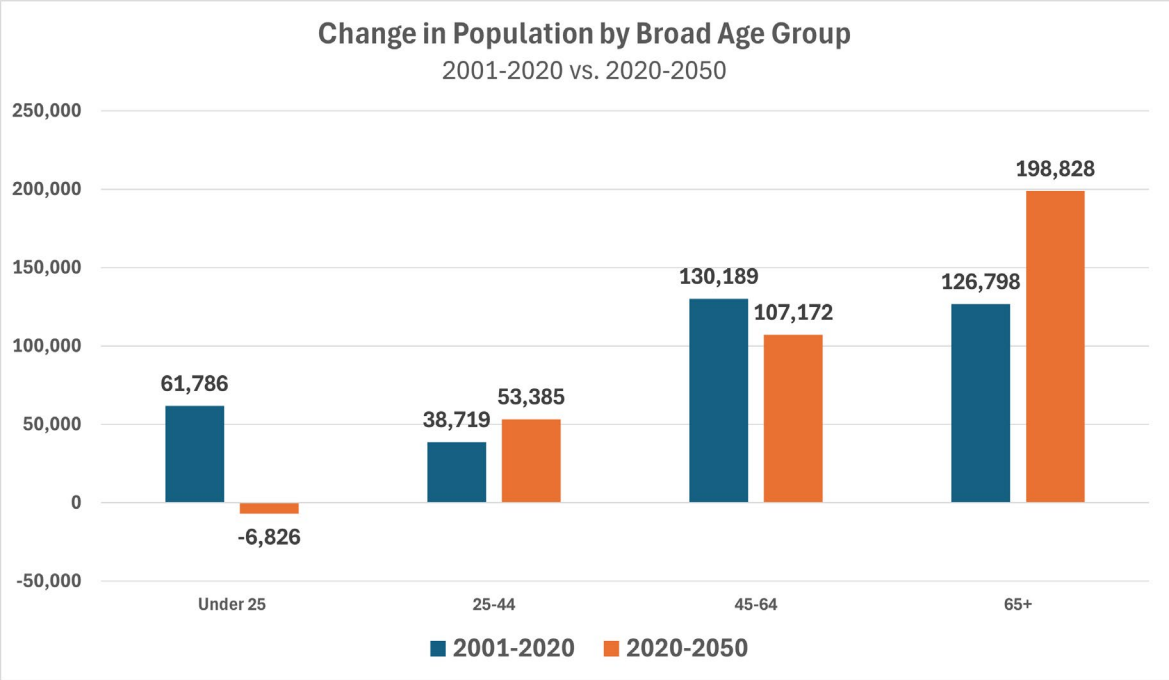
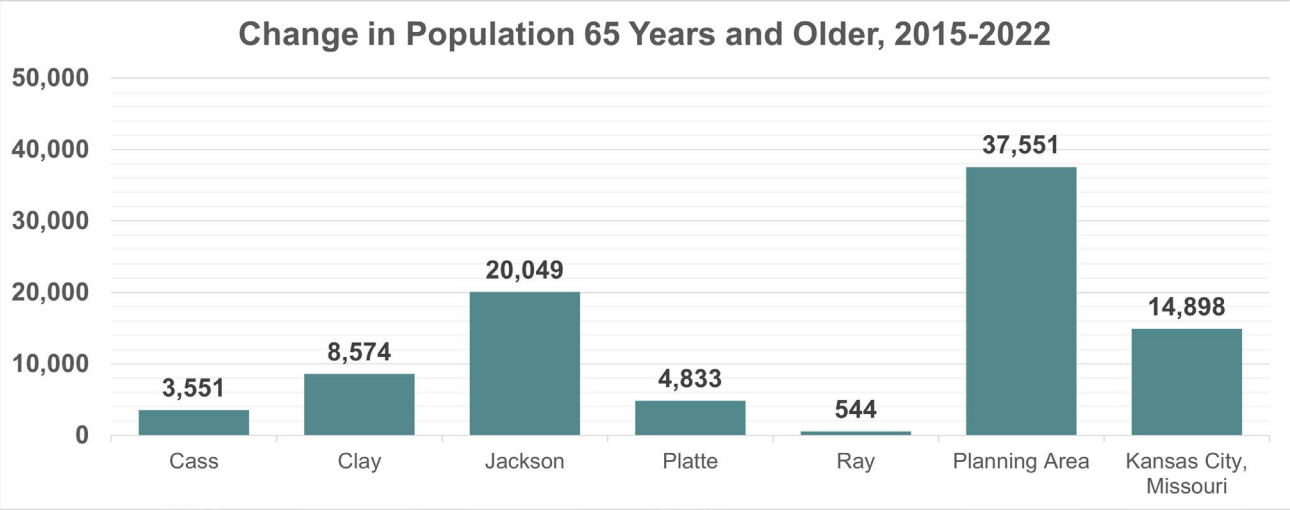


Figure 2.36: Kansas City MSA Population Change by Broad Age Group, 2001-2020 and 2020-2050
Source: U.S. Census Bureau and MARC

Perhaps the biggest demographic change expected in the future is the aging of the population. The number of older adults—defined as those 65 years old and above—in the Kansas City metropolitan area is expected to increase by 233,000 between 2020 and 2050 **(Figure 2.36).**

In 2015, older adults were 13 percent of the planning area's population. With the 2022 population estimates from the American Community Survey, older adults over 65 years old make up 15 percent of the five-county planning area. The number of older adults increased by 37,551 between 2015 and 2022, with 53 percent of the increase occurring in Jackson County. All counties in the planning area gained older adults. The aging of the baby boom generation means the senior share of the region's population is expected to increase to 20 percent by 2030. As a result, the population 65 and older will approximately double between 2010 and 2030 bringing their total to nearly one-half million. In fact, fully 58 percent of the Kansas City metropolitan area's total population growth between 2010 and 2030 is expected to be as a result of the increase in adults 65 years of age and older.



Source: U.S. Census Bureau ACS

Figure 2.37: Change in Population 65 Years and Older 2015–2022

Conversely, the younger adult share of the population will decline from 28 percent to 24 percent, while the middle-aged adult share will decline from 27 percent to 24 percent between 2010 and 2030. (See Figure 2.49) Because the region's overall population is expected to grow by some 600,000, however, these age groups are still projected to increase in numbers despite their declining share.

These changes in the age structure of the population have implications for how the region accommodates its population growth in terms of its land use. Compared to the prior 20 years, most of the growth in the future will be from households who may seek a smaller rather than a larger home in which to live, with amenities near-by and accessible by multiple means—walking, transit, ride sharing—rather than only by way of driving a private motor vehicle.

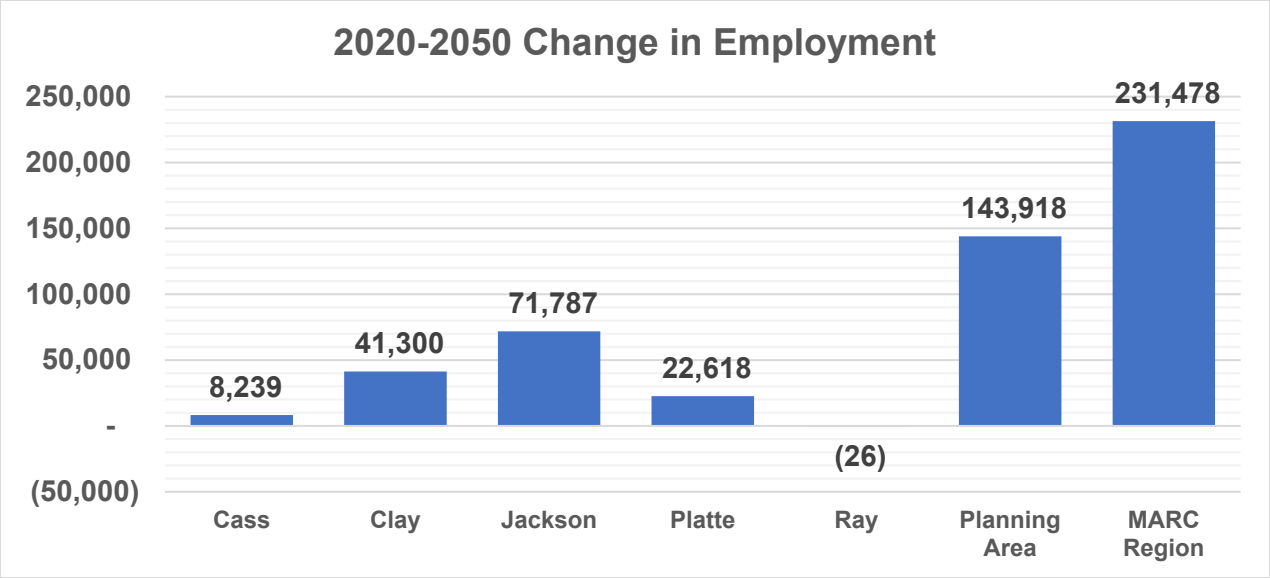
2.4.3 Employment Forecasts

The five-county planning area is expected to add almost 144,000 new jobs between 2020 and 2050, a 26% increase. Growth is expected to be greatest in Jackson County, with the addition of 71,787 jobs. Platte County is expected to see the largest percentage job growth over the forecast period, growing 48%.

Table 2.9: Employment Forecast by County

COUNTY	2020	2030	2050	2020-2050 Change	2020-2050 % Change
Cass	27,370	31,614	35,607	8,239	30%
Clay	105,335	133,248	146,636	41,300	39%
Jackson	370,602	404,287	442,368	71,787	19%
Platte	47,392	61,603	70,005	22,618	48%
Ray	3,795	3,791	3,768	(26)	-0.7%
Planning Area	554,494	634,542	698,385	143,918	26%
Planning Area Share	54%	55%	56%	1.5%	2.7%
MARC Region	1,022,823	1,154,485	1,254,270	231,478	23%

Source: Bureau of Labor Statistics, Census Bureau, MARC.



Source: Bureau of Labor Statistics, Census Bureau, MARC

Figure 2.38: Employment Change, 2020-2050

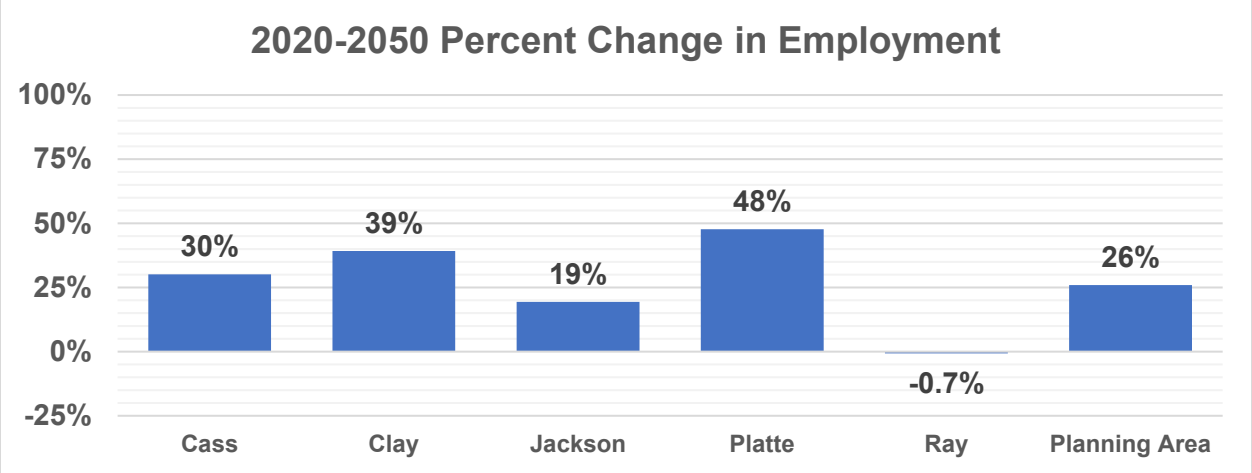


Figure 2.39: Employment Change, 2020-2050 (%)

Platte County's job growth is expected to be the next fastest, as it is forecast to increase its 2020 employment levels by 48 percent, resulting in a gain of 22,618 jobs. Meanwhile, Ray County's jobs will drop slightly over the period. **(See Table 2.8 and Figures 2.38 and 2.39)**

The city of Kansas City accounts for 45 percent of the Planning Area's projected employment growth. In addition to the area near KCI, significant employment increases are expected in and around Downtown, in Kansas City north in Clay County, in eastern Jackson County, and in south Kansas City. Professional and scientific services, health care, manufacturing and wholesale trace are among the growth industry sectors in the planning area.

Other cities in the Planning Area expecting to add a significant number of jobs include Liberty in Clay County, Lee's Summit. Independence and Blue Springs in Jackson County. **(Figure 2.40)**

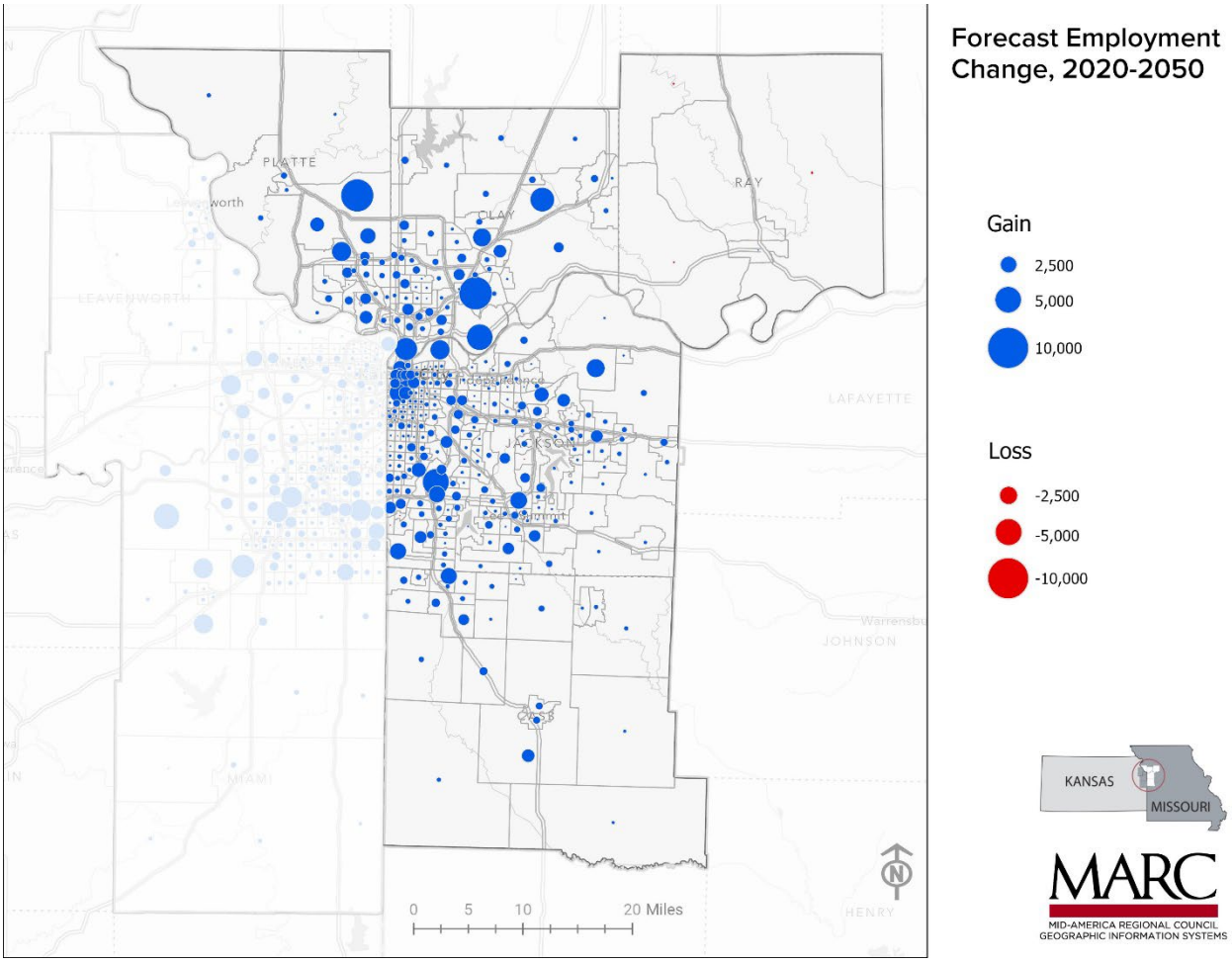


Figure 2.40: Forecast Employment Change 2020-2050 Source: MARC

2.5 Kansas City Regional Economy

2.5 Kansas City Regional Economy

MARC serves as the Economic Development District for the 9-county Kansas City metro area, including the Missouri side Planning Area. A new Comprehensive Economic Development Strategy Plan was adopted by the MARC Board of Directors in September 2024. The Plan reviewed updated demographic and economic data, included a SWOT analysis and outlined goals and strategies to strengthen the region's economy and support inclusive prosperity. Economic Development | MARC

In exploring the region's economic resiliency and prosperity, the economy's overall growth rate is measured by its growth in workers and their productivity. However, growth, all by itself, isn't enough. Inclusion allows everyone to experience the benefits of that growth through a rise in their standard of living.

The 2024-2029 CEDS aligns with the region's business-led civic collaborative – KC Rising – and its *Pillars of Prosperity* focused on economic prosperity for all. KC Rising established four long-term metrics key to determining how well the Kansas City region is simultaneously achieving both greater economic growth and greater inclusion in receiving the benefits from that growth.

Two of the four are overarching growth metrics followed by two overarching inclusion metrics.

- **Net migration rate**, a key component of population growth thus labor force growth
- **GDP** per job, a measure of productivity, or how much each worker produces.
- **Percent of workers living in self-sufficient households**, a measure of whether jobs that people have are sufficient to cover bills for necessities such as housing, transportation, childcare and healthcare.
- **Black/white housing wealth gap**, based on a measure of homeownership. Even self-sufficient incomes may not be sufficient to cover unexpected expenses. It takes wealth to be resilient in the face of adversity and this starts with owning a home.

Benchmark Metros

To measure progress, KC Rising benchmarks the **region against ten aspirational metros** that historically have done a little better than KC on growth, inclusion, or both, and that we continuously compete against for economic development projects. These metros are Austin, Charlotte, Cincinnati, Columbus OH, Denver, Indianapolis, Minneapolis, Nashville, Portland, and Raleigh.

What enables the population of some metros to grow faster than others is their ability to attract people from outside the area. This makes net migration a measure of a region's ability to attract and retain talent, which is essential to business attraction and retention.

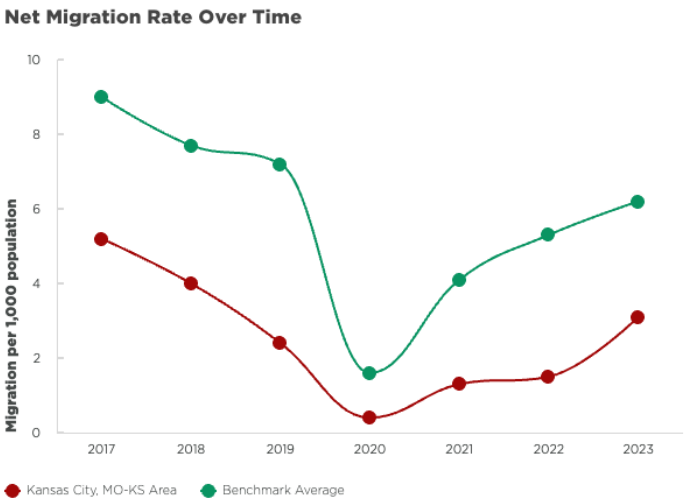
BENCHMARK METROS

Austin
Charlotte
Cincinnati
Columbus
Denver
Indianapolis
Minneapolis
Nashville
Portland
Raleigh

Net Migration

Kansas City's ***net migration rate*** is half that of the benchmark metro average, though in the last year the region began to close a gap that had been widening post-pandemic. Its net migration rate doubled in the past year and currently ranks 8 out of 11.

Figure 2.41: Net Migration Rate Over Time



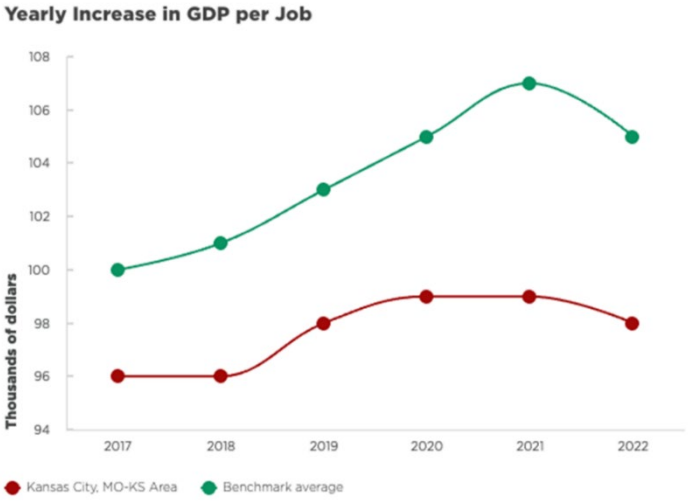
Sources: Census Bureau Population Estimates 2017-2023
Note: Calculation based on 3-year moving average.

Gross Domestic Product (GDP)

GDP measures the total economic value generated by an economy's businesses in the process of employing workers to transform inputs into finished goods and services for sale. GDP per job measures the average amount the region's workers are able to contribute to GDP. As such, it is a measure of business productivity.

High levels of business productivity tend to attract other businesses. Unfortunately, Kansas City's ***GDP per job*** currently ranks 10 out of 11 and the gap compared to benchmark metros has grown by $3,000 per worker over the past five years. Considering the region has more than 1 million workers, this increase costs the economy $3B annually.

Figure 2.42: Yearly Increase in GDP per Job

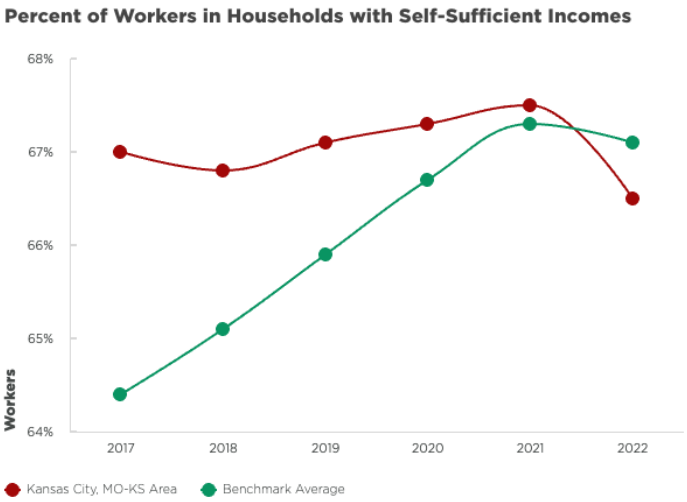


Sources: Bureau of Economic Analysis 2017-2022
Notes: Calculation based on 3-year moving average.

Self-Sufficient Households

Growth, all by itself, isn't enough. We want everyone to experience the benefits of that growth through a rise in their standard of living. One measure of whether everyone is benefiting is whether all households earn enough to pay their bills. If they do, then we can consider them to be **self-sufficient households**. Increases in self-sufficiency generally mean incomes are rising faster than costs.

Kansas City's historical affordability advantage is slipping and currently ranks 8 out of 11. While most metros saw significant progress in becoming more affordable between 2017 and 2022, Kansas City's progress stagnated and appears to have reversed in the last year.



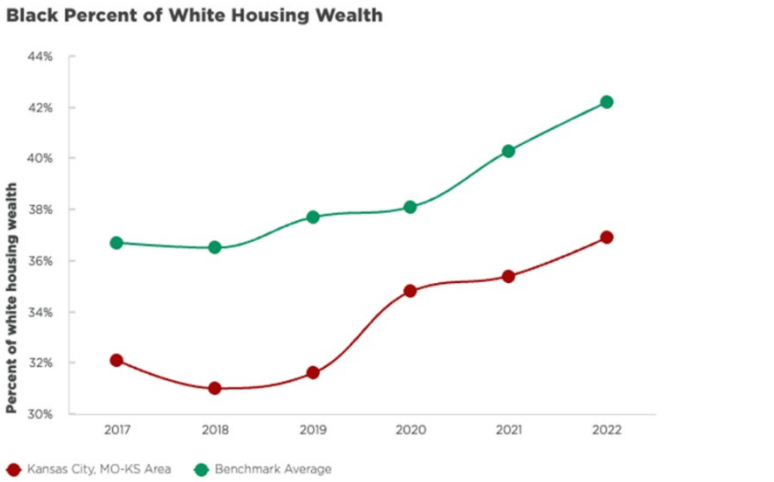
Sources: American Community Survey PUMS 2017-2022.
Note: Calculation based on 3-year moving average.

Figure 2.43: Percent of Workers in Households with Self-Sufficient Incomes

Wealth Gap

Self-sufficiency alone is not enough either. While a self-sufficient income can pay the bills, it can also be fragile if there are unexpected expenses, such as a serious illness, or unexpected loss of income, as when one of the earners in the household loses their job. **Resiliency in the face of unexpected adversity requires wealth** and, for most households, wealth-building begins with home ownership.

Black households in Kansas City average about 37% of the housing wealth of white households, a rate that ranks 10th among its benchmark metros in 2022. While up from 32% in 2017, Kansas City's advancement has not enabled it to improve its performance relative to the benchmark average.



Sources: American Community Survey PUMS 2017-2022
Note: Calculation based on 3-year moving average. Benchmark average calcuated using unweighted average of the metros.

Figure 2.44: Black Percent of White Housing Wealth

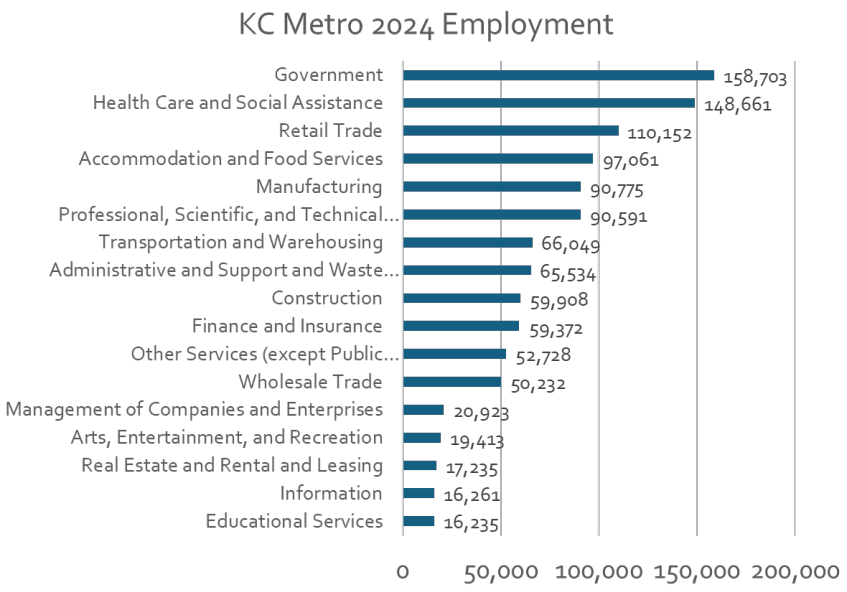


Figure 2.45: KC Metro Area Employment Source: Lightcast 2024

What explains the region's sluggish economic performance? Kansas City's industrial structure is heavily oriented toward production of services rather than goods. This is similar to the nation. How similar can be measured by comparing each industry's proportion of total regional and total national jobs. When they are the same, the ratio of these proportions, called a "location quotient," is equal to 1.

In the Kansas City region, over 85% of employment in industry sectors with a location quotient between 0.9 and 1.2. Those include Professional, Scientific and Technical Services; Wholesale Trade, Management of Companies; Other Services; Arts, Entertainment and Recreation; Construction and Retail Trade. Only two sectors have LQ's greater than 1.2 – Transportation and Warehousing and Finance and Insurance. Manufacturing is just below 1.0 at .98. Yet, regions grow by serving a larger economy through exports. The dollars they bring to region are used to hire workers whose spending on homes, transportation, food, education, and entertainment create the demand that supports all of a region's local-serving jobs. In general, for regions the size of the Kansas City metropolitan area, each dollar earned from the sale of an exported good or service generates at least one additional dollar of sales for local-serving industries.

While having a broad-based economy that mirrors the nation promotes economic stability, it also suggests the region's capacity to export goods and services to the rest of the world is relatively weak. Exporting depends on being the superior producer of something the rest of the world needs or wants but does not produce or produce it as well. Therefore, specialization is a key to having product to export.

EXPORTS

Location quotients, then, measure the level of specialization and so are one indicator of export capacity. If we look at more detailed industries than the broad sector level, definite employment specializations emerge. These industries all have location quotients greater than 1.5, with small- arms manufacturing, electronics manufacturing, monetary authorities and communications equipment manufacturing all having LQs greater than 10.

Figure 2.46: KC Largest Exporting Industries Source: Lightcast

However, by ranking the same industries by their number of employees, a clearer picture emerges of the industries on which the Kansas City regional economy depends – warehousing, computer systems design, insurance, engineering, hospitals, auto manufacturing, electronic manufacturing, freight-related transportation, medical labs. These, then, are the economic clusters that have historically powered the region's economy.

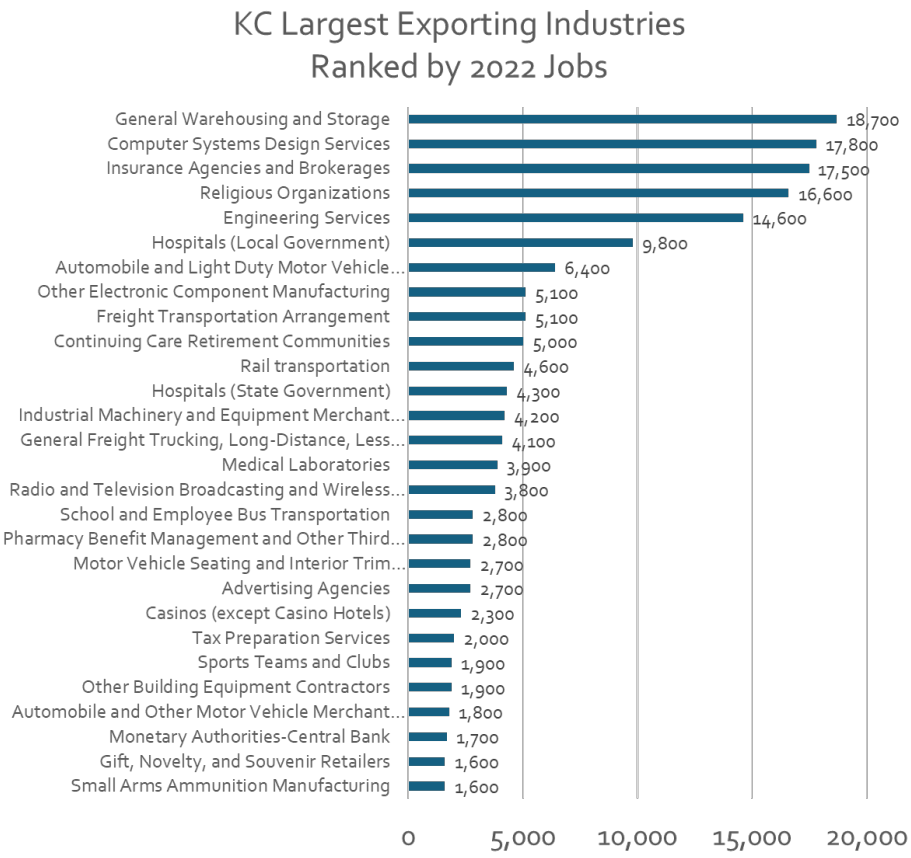


Figure 2.47: KC Largest Export Industries Ranked by 2022 Jobs Source: Lightcast

2.5.1 Planning Area Economy

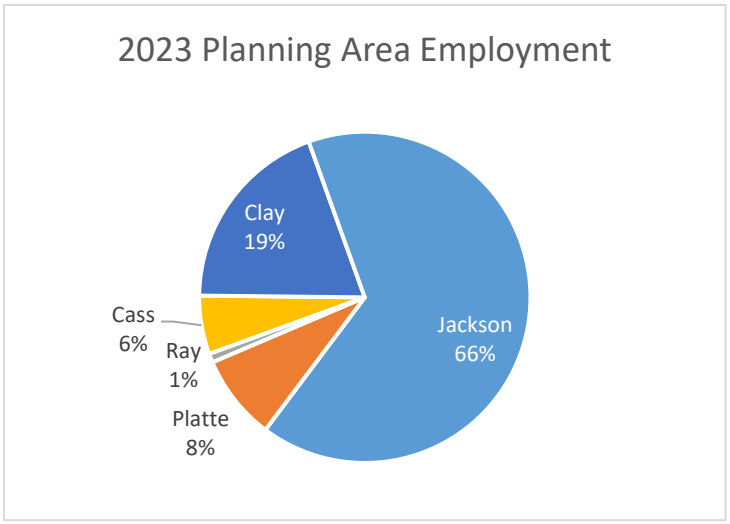


Figure 2.48: Planning Area Employment, 2023 Source: Lightcast 2023

Jackson County comprises 66 percent of the planning area jobs, with 409,409 jobs of the planning area's total job count of 622,677. Clay and Platte counties form the next largest portion of the Planning Area economy with 27 percent of its jobs, combined. Clay County's 120,000 jobs account for 19 percent of the area job total, while Platte County's 52,000 jobs contribute another 8 percent. The remaining 7 percent of the Planning Area's jobs are mostly in Cass County, with Ray County contributing one percent.

The 2020 Plan update characterized the Planning area as showing strong employment growth. The plan was published just prior to COVID-19 pandemic, which caused a dramatic but temporary loss of jobs. The region has recovered most of the jobs lost during the pandemic but is growing at a slower pace.

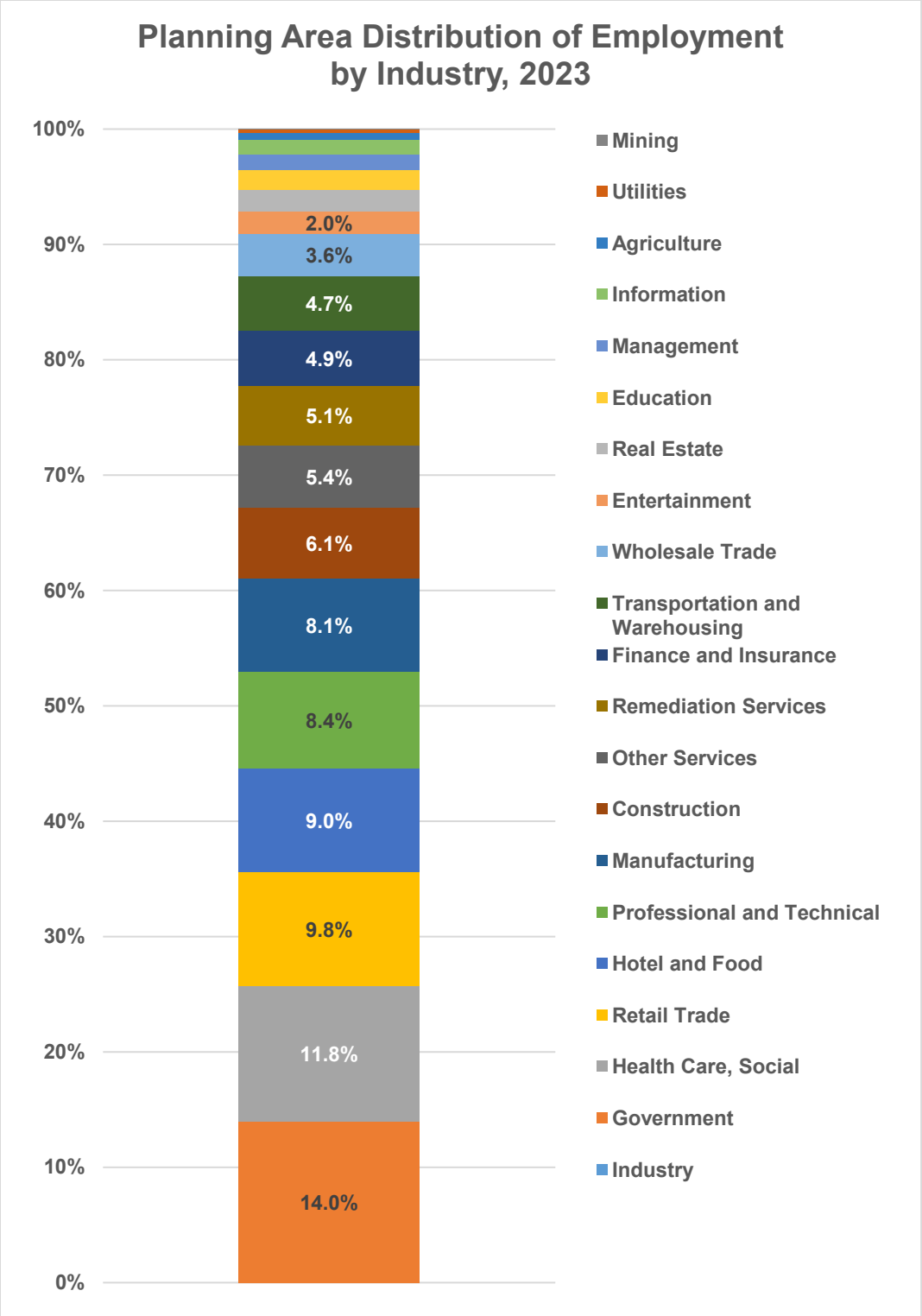
2.5.2 Employment by Industry

Government is the largest industry in the Planning Area, compromising 14 percent of its total employment. The vast majority of government is local government, and within that sub-sector, public schools make up the largest component.

The next largest industry is health and social services, with 11.8 percent of the area's employment, followed by retail (9.8%), hotel and food (9%) and the professional services industry (8.4%) of the planning area's overall employment.

Retail, hotel and food workers tend to have wages that are lower than average. The next three largest industries, however—manufacturing, finance and insurance, and administrative —employ people making above average wages. Jobs in skilled trades have become a larger segment of the workforce, with construction trades, manufacturing, wholesale trade and transportation/logistics accounting for over 22 percent of the jobs in the planning area. (Source: Lightcast 2023**)**

Different counties specialize in different industries, however, so it is useful to compare their distribution of employment with the Planning Area overall.



Source: Lightcast 2023

Figure 2.49: Planning Area Distribution of Employment by Industry

See Table 2.10: Employment by Industry by County for the Planning Area 2023 (Bureau of Economic Analysis). Each county has a specialized combination of employers and employment. Cass County's largest employment sectors include government, retail trade, warehousing, hotel and food establishments, and construction. Clay County's employment led in government, manufacturing, retail trade and hotel and food establishments. Jackson County's major employment sectors are government, health care, professional and technical services, hotel and food establishments, manufacturing and construction. Plate County's largest employment sectors are retail trade, government, hotel and food establishments, warehousing and construction. Ray County's detail was not available.

Table 2.10: 2023 Jobs by Industry and by County 2023

Jobs by Industry	Cass	Clay	Jackson	Platte	Ray	Planning Area
Government	5,158	16,792	58,300	5,361	N/A	86,932
Health Care, Social	3,428	9,853	55,099	4,518	N/A	73,231
Retail Trade	4,915	12,882	36,126	6,718	N/A	61,290
Hotel and Food	3,639	10,640	36,298	5,233	N/A	56,233
Professional and Technical	1,156	8,041	40,227	2,516	N/A	52,109
Manufacturing	2,145	14,621	28,962	3,987	N/A	50,202
Construction	3,008	6,723	25,098	2,970	N/A	38,165
Other Services	1,665	6,160	23,302	2,197	N/A	33,927
Remediation Services	2,018	8,875	17,013	3,748	N/A	31,759
Finance and Insurance	795	2,793	24,919	1,594	N/A	30,223
Transportation and Warehousing	3,849	8,131	12,598	4,484	N/A	29,336
Wholesale Trade	983	6,431	11,777	3,263	N/A	22,523
Entertainment	375	2,907	7,684	1,427	N/A	12,449
Real Estate	376	2,099	7,243	1,535	N/A	11,290
Education	282	1,254	8,640	974	N/A	11,167
Management	33	1,037	6,840	297	N/A	8,224
Information	125	543	6,677	577	N/A	7,942
Agriculture	1,458	290	1,353	313	N/A	3,602
Utilities	191	161	1,226	225	N/A	1,828
Mining	78	103	28	16	N/A	246
	35,676	120,337	409,409	51,954	5,301	622,678

Source: Bureau of Economic Analysis

2.5.3 Employment Location

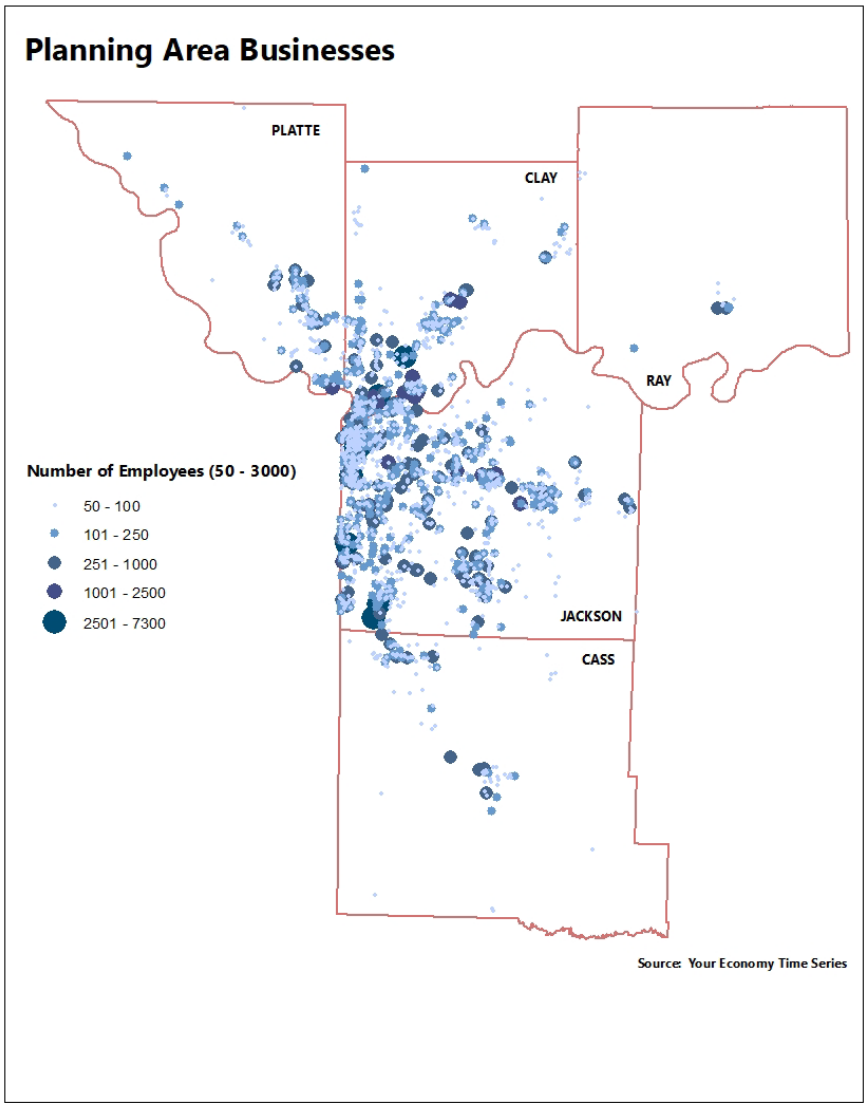


Figure 2.50: Areas of Business by Number of Employees

Businesses tend to locate where there is a combination of high demand in terms of population and income and good access to a talented workforce. As a result, businesses tend to cluster along major roadway facilities in areas with significant population density. Exceptions are industrial and warehouse facilities, where access to large tracts of land with good rail access is more important than access to population. The region's most recent large employment centers tend to be located along major highways in outlying suburban areas, such as major logistics centers, new data centers and the new Panasonic EV battery plant and associated development.

Shopping centers are located near major arterials and highway interchanges to maximize their access to the biggest possible consumer market. This is especially apparent when examining some of the Planning area's largest shopping areas (See Figure 2.51: Area Shopping Centers below). For example, Independence Center, with 1.4 million square feet of space, is located at the intersection of I-70 and U.S. 291. Zona Rosa, Tiffany Springs Market Center, and Boardwalk Square all sit at in different quadrants of the I-29/M-152 Interchange while Barry Towne is near the intersection of U.S. 169 and M-152 in Clay County, and Summit Fair and Summit Woods Crossing in Lee's Summit are located at the intersection of I-470 and U.S. 50.

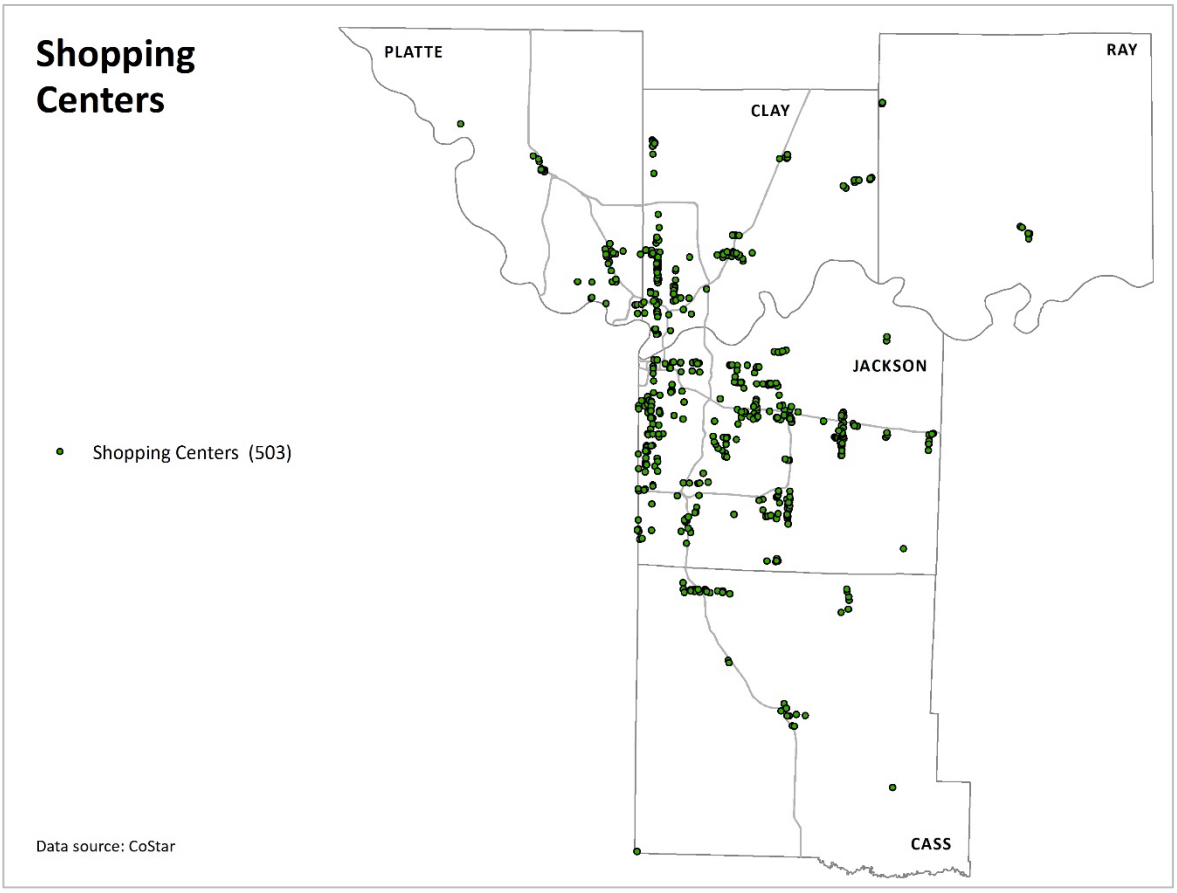
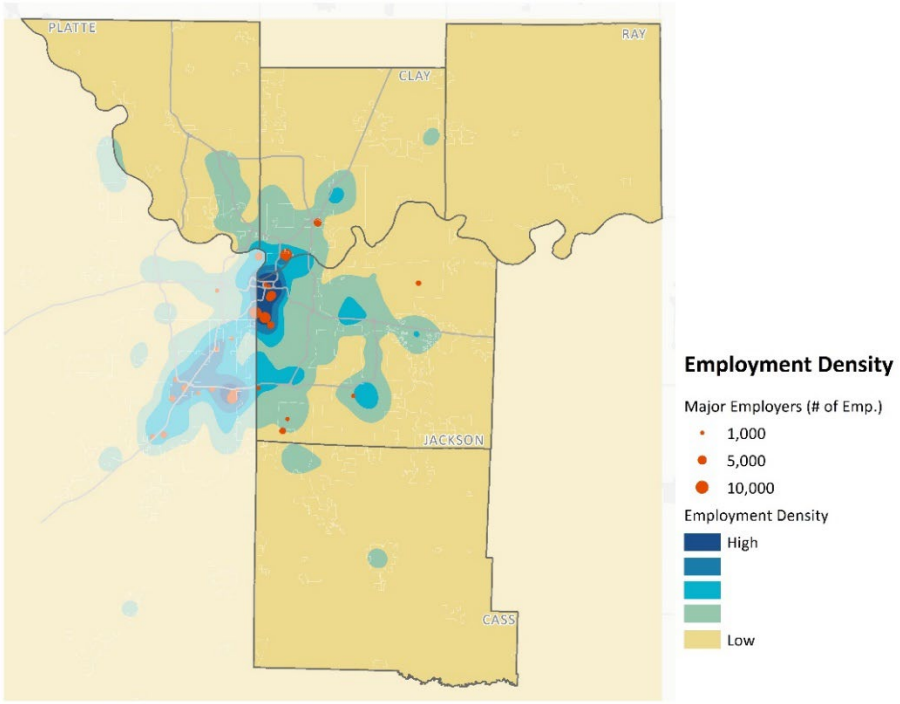


Figure 2.51: Area Shopping Centers

The nation's oldest shopping center, and still one of the region's most successful, the Country Club Plaza, is located along Ward Parkway near Broadway and Main, all principal arterials. It anchors the south end of the region's densest cluster of employment, which stretches from the River Market area, through Downtown, the Crossroads and Crown Center to the Plaza.

Downtown has seen a remarkable economic turnaround, with the opening of the Sprint Center and Power and Light District in 2007. Considerable conversions of older buildings to loft spaces and significant new multifamily and hotel construction is occurring throughout the downtown from the City Market through the Crossroads area, especially along the KC Streetcar line that opened in 2016. Due to overwhelming success of the first phase of the transit system, the extension from Union Station to the Country Club Plaza and UMKC along Main Street is expected to begin operation in 2025. Additionally, a new 800-room convention hotel immediately adjacent to the Bartle Hall Convention Center opened in 2020.

Major employers located principally or headquartered in the planning area include Cerner and North Kansas City Hospital in Clay County; HCA Midwest Health System, Saint Luke's and Children's Mercy Hospitals, Hallmark Cards, DST (State Street), Truman Medical Centers, Honeywell, Burns & McDonnell, and Commerce and UMB Banks in Jackson County; and Farmland and Citi Cards in Platte County. Several plant closings, including the Harley-Davidson plant in Platte County, will impact employment. (MARC)

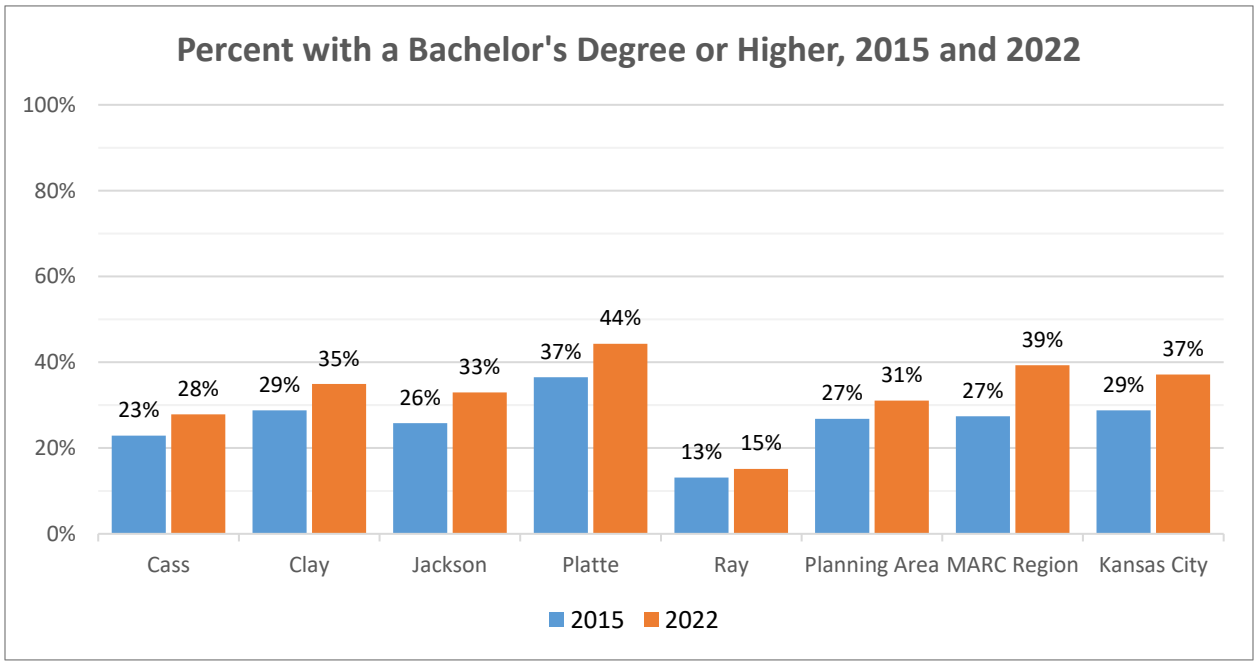


Source: Census Bureau, Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES), 2011

Figure 2.52: Area Employment Density

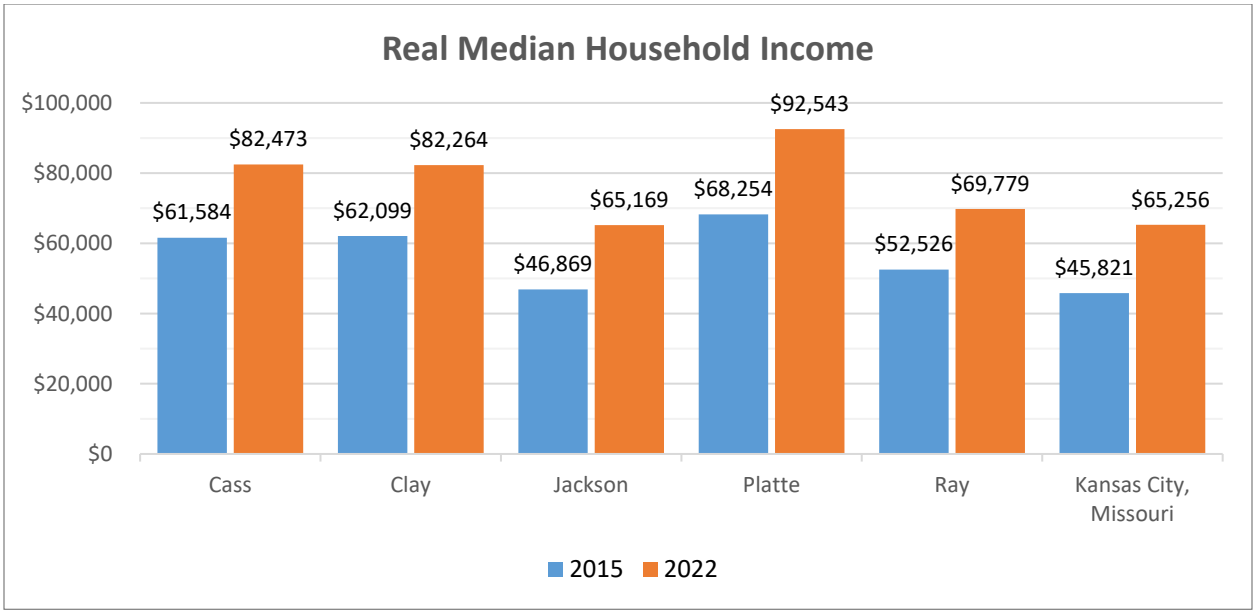
2.5.4 Education & Income

In recent years, all counties in the planning area have seen significant increases in adult educational attainment, as measured by the percentage of their residents 25 years and older who have earned a bachelor's degree or higher. The planning area saw a four percent increase in the overall educational attainment average between 2015 and 2022. It was led by Platte County, whose residents' attainment of a bachelor's degree increased seven percentage points over the period, to 44 percent. Clay County has the second highest average level of educational attainment in the planning area, with 35 percent of its residents earning at least a bachelor's degree. Kansas City, Missouri, increased by 8 percent to 37 percent of all adults. In the 2015-2022 period, Ray County has increased the slowest, at 0.08 percent. (Figure 2.53)



Source: U.S. Census Bureau 2015-2022 American Community Survey

Figure 2.53: Bachelor's Degree or Higher, 2015 and 2022 (%)



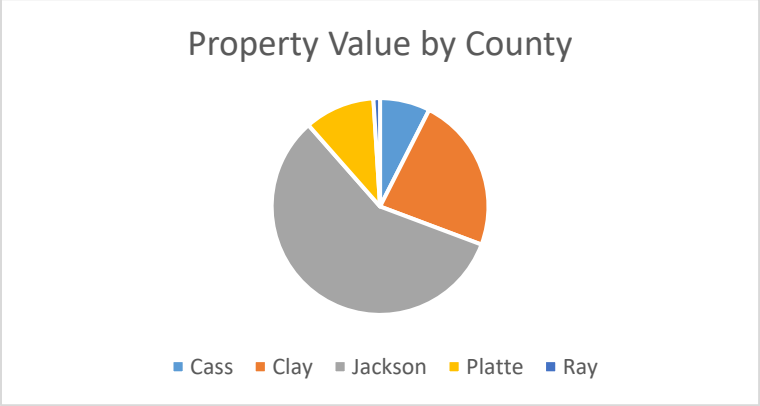
Source: U.S. Census Bureau, American Community Survey

Figure 2.54: Real Median Household Income

Like educational attainment, the real median household income increased in every county in the planning area. The real median household income annual income of the household right in the middle – half the area's households earn more, and half earn less. Real incomes are those after adjusting for inflation and so measure the purchasing power of households. The data is based on inflation adjusted dollars for that year. Because the consumer price index increased 30 percent across the nation between 2015 and 2022, in the Kansas City metropolitan area over this period, nominal incomes would have needed to increase 30 percent simply to keep up. Ray County had the lowest in 2015 and Jackson County had the lowest in 2022. Median household incomes increased between 32 and 39 percent across the 5 counties with the highest in Jackson County, a 39 percent gain.

Platte County has the highest median household income of all planning area counties with $92,543 in 2022. Households residing in Clay and Cass counties have the next highest incomes, with their median households earning over $84,000. Jackson County has the lowest median household income of any county in the planning area, at $65,169. This is largely due to the concentrated poverty in the city of Kansas City, which itself has a median household income of $65,256.

2.6 Property Value



Source: County Assessors 2023

Figure 2.55: Total Property Value by County

Despite having the lowest household incomes among the counties in the planning area, Jackson County contains a significant majority of real estate value due to its relative size and its function as an employment center. Jackson County is home to 59 percent of the planning area's population, and 58 percent of its property value, approximately the same as its percentage of the planning area employment. Clay County contains 23 percent of the real estate property value in the planning area and Platte County contains 10.5 percent, both of which are also about the same as their share of the area's employment. (See Figure 2.55)

The total value of real estate property in the planning area in 2023 was approximately $102.5 billion. Jackson County accounted for $59.3 billion of that, followed by Clay with $23.8 billion, Platte with $10.8 billion, Cass with $7.7 billion, and Ray with $1 billion. The city of Kansas City alone accounted for over one-fourth (26 percent) of the property value in the planning area with $28.9 billion.

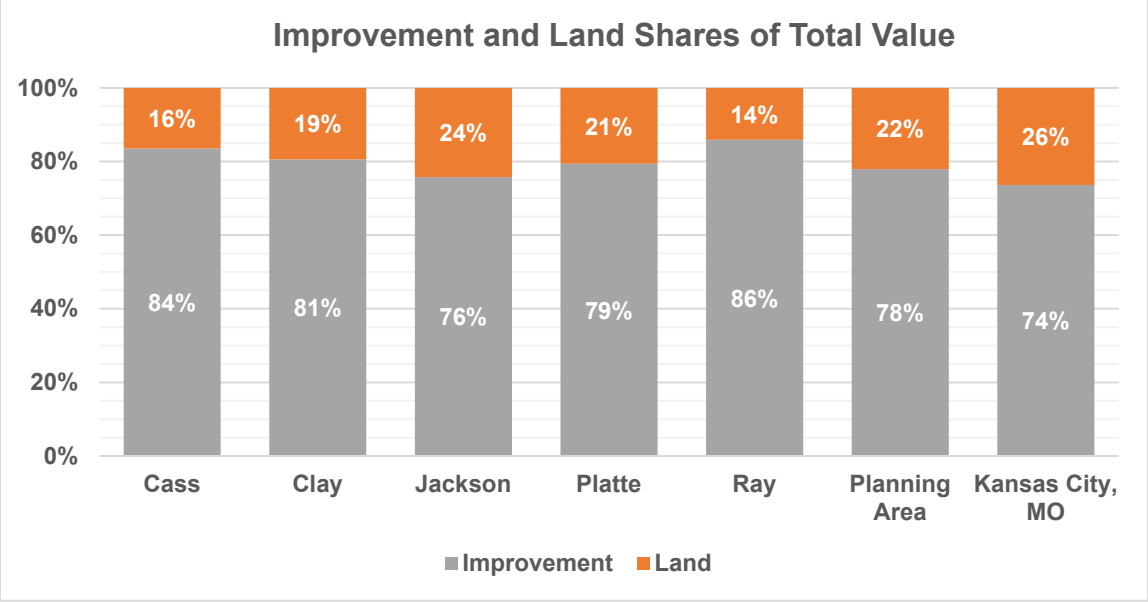


Figure 2.56: Improvement and Land Shares of Total Value

Improvements, principally buildings, comprise 78 percent of the total property value in the planning area, with land value accounting for the remaining 22 percent. These shares are remarkably stable across the counties in the area. Land's share of total property value ranges from a low of 14 percent in Ray County to a high of 24 percent in Jackson County.

Table 2.11: Improvement, Land, and Total Property Value

County/Area	Land	Improvement	Total
Cass	$1,265,531,563	$6,413,229,155	$7,678,760,718
Clay	$4,628,898,360	$19,188,024,099	$23,816,923,100
Jackson	$14,373,386,758	$44,889,149,446	$59,262,536,204
Platte	$2,217,831,190	$8,546,167,805	$10,763,998,995
Ray	$142,571,942	$870,240,724	$1,012,812,666
Planning Area	**$22,628,219,813**	**$79,906,811,229**	**$102,535,031,683**
Kansas City, MO	$7,061,433,338	$21,275,078,316	$28,891,081,845

Source: County Assessors, 2023

2.7 Critical Infrastructure

2.7.1 Transportation

The Kansas City region, a major transportation hub, sits at the intersection of four interstate highways — Interstates 70, 35, 29 and 49 — which connect the region to both coasts, Canada and Mexico. In addition, the region is served by numerous interstate beltways, U.S., and state highways.

Streets and highways form the foundation of the transportation system. According to the latest data, nearly 16,000 miles of public roadways in the region carry about 47 million vehicle miles of travel each day. Based on the Federal Highway Administration 2012 Highway Statistics Report, the bistate Kansas City urbanized area ranks 28th in the nation for roadway miles per capita, far ahead of larger urbanized areas such as St. Louis, Atlanta and Chicago.

Major trucking companies operate out of the Kansas City area. Air transportation, including considerable air freight operations and general aviation activity, is served by Kansas City International Airport, Charles B. Wheeler Downtown Airport and a number of smaller general aviation airports. Kansas City is the second busiest railroad center in the nation, with major rail yards for Union Pacific, Burlington Northern, and Canadian Pacific. The region is also served by barge transportation, with about a dozen regulated barge lines transporting goods through the metropolitan area on the Missouri River (MARC Transportation Plan).

2.7.2 Roadway System Infrastructure

Kansas City's system of roadways is among the most extensive in the nation. According to Federal Highway Administration 2012 statistics, the Kansas City region ranks 28th nationally among major metropolitan areas on the most freeway miles per person of urbanized areas with populations greater than 500,000.

These rankings are due in large part to the extensive highway projects implemented in the Kansas City region during the 1970s and 1980s, such as the construction of the Interstate 435 loop. **Table 2.12** shows the functional class miles for major freeways and roadways in the Kansas City Area. Data was collected by the MARC transportation department, no data reported for Ray County.

Table 2.12: Transportation Facilities by Functional Class Miles					
Roadway Type	**Cass**	**Clay**	**Jackson**	**Platte**	**Planning Area**
Interstate	60	93	177	99	429
Freeway / Expressway	0	109	119	25	254
Principal Arterial	49	60	189	34	332
Minor Arterial	100	145	507	90	842
Major Collector	249	197	310	160	915
Minor Collector	45	11	2	8	66
Total	**503**	**616**	**1,305**	**415**	**2,839**

Source: MARC

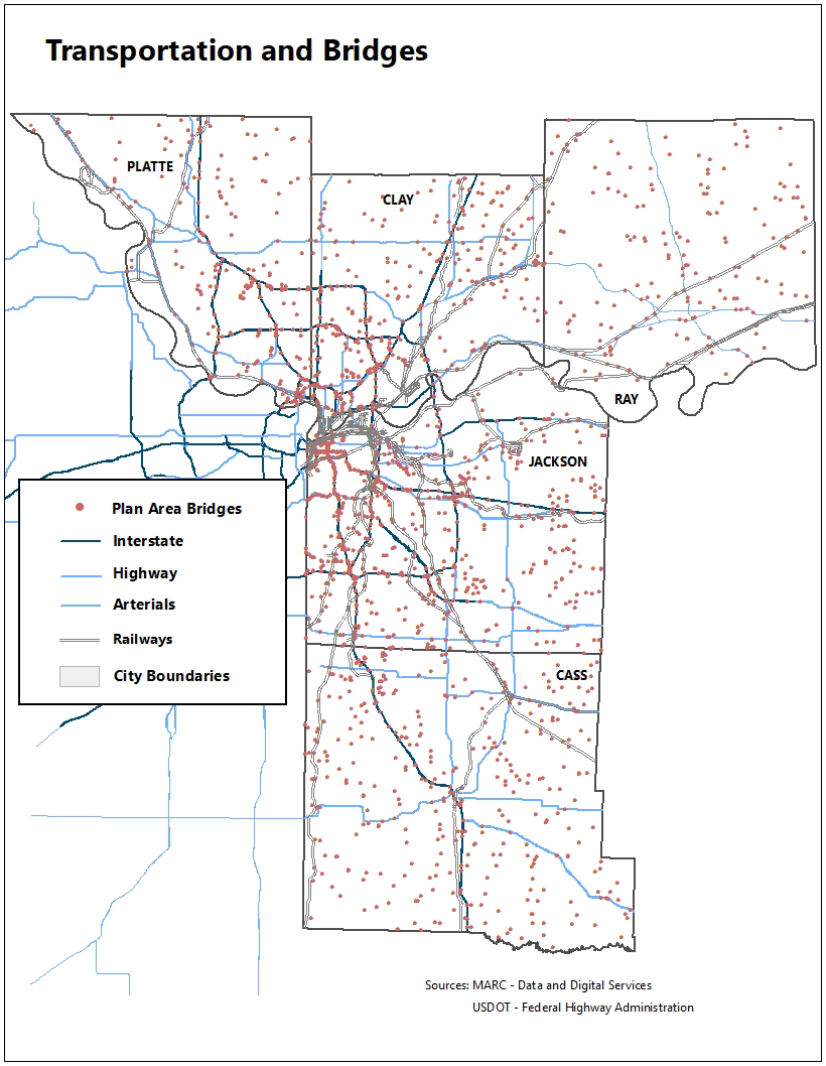


Figure 2.57: Regional Transportation System

2.7.3 Roadway System Condition

According to The Road Information Program's (TRIP) report *Missouri Transportation by the Numbers: meeting the State's Need for Safe, Smooth, and Efficient Mobility*, one-third of the nation's major urban roads are rated in poor condition. In the 2018 report, Kansas City's average pavement conditions showed significant increase in the percentage of roads with "poor" conditions in comparison to the 2013 Bumpy Roads Ahead research report.

In the 2013 report, only 15 percent of Kansas City's roads were classified as "poor" pavement conditions. In 2018, 26 percent of the roads were classified as "poor". The 2018 report found 27 percent of the Kansas City region's roads to be in mediocre condition; 17 percent fair; and 30 percent good. The Bumpy Road Ahead report also breaks down the hidden costs of deficient roads. In Kansas City, drivers should expect to pay $667 in additional vehicle operating cost, $334 in traffic crashes, and $988 in lost time and wasted fuel due to congestion. TRIP's report uses FHWA data for its analysis.

2.7.4 Bicycle/Pedestrian Trails

Bicycle and pedestrian trails in the Kansas City metropolitan area are being developed at an increasing rate as local communities hear from their residents about desires for safe facilities to walk and bicycle. Many of the local trail facilities are part of MetroGreen®, a plan for a 1,100-mile, area-wide, interconnected system of public and private open spaces, greenways and trails that will link seven counties in the Kansas City metropolitan area. Error! Reference source not found. MARC's Long-Range Transportation Plan shows Bicycle and Pedestrian Trails and on-road facilities in the MARC area (Cass, Clay, Jackson, Johnson, Leavenworth, Miami, Platte, Ray, Wyandotte) and the Hazard Mitigation planning area (Cass, Clay, Jackson, Platte, Ray). Additionally, many communities in the region have adopted local plans for both on-road and off-road facilities.

Table 2.13: Bicycle and Pedestrian Trails (Miles)

Mobility Type	MARC Region	Planning Area
Bike Lanes	104.46	37.48
Cycle Track	0.89	0.89
Mountain Bike Trails	117.76	71.4
Walking/Hiking Trails	241.64	144.86
Bike Routes	220.43	220.43
Share-the-Road Bikeways	506.92	147.93
Paved Trails	755.09	397.24

Source: MARC

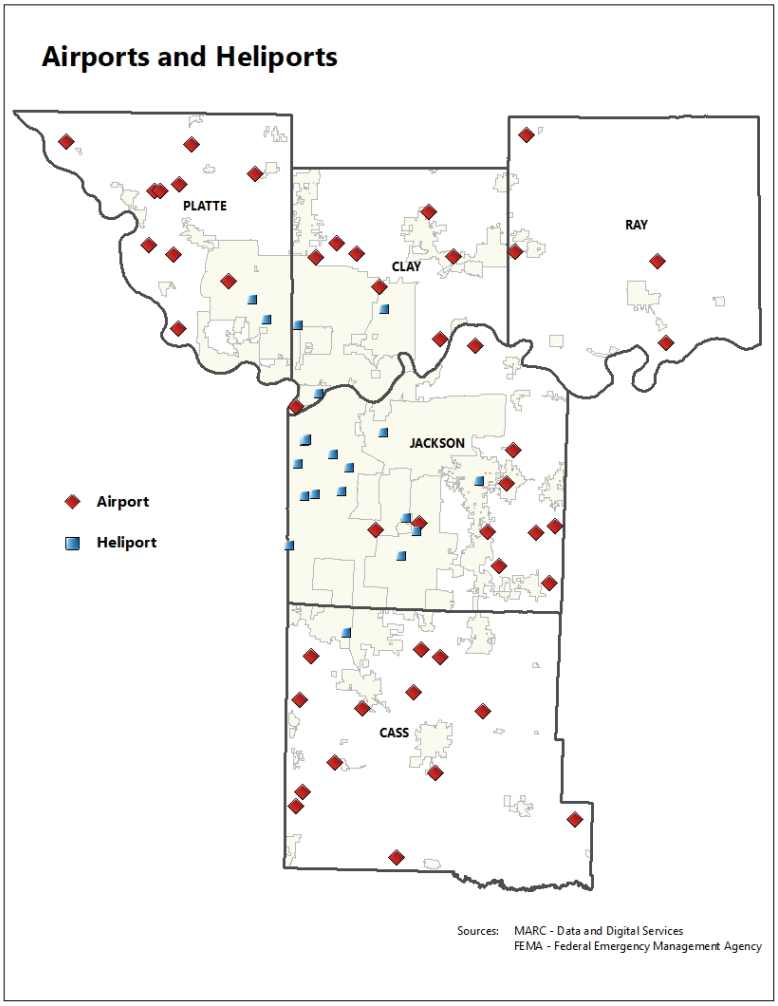
2.7.5 Freight and Goods Movement Facilities

Kansas City's rail system consists of five Class I railroads and several regional or short line carriers. The extensive rail network throughout the region serves local industry with major intermodal yards and provides connection to international markets. BNSF Railway's Transcontinental Route runs diagonally through the region from the southwest to the northeast. The "Transcon" connects the Ports of Los Angeles and Long Beach to Chicago via Kansas City with 80 to 90 trains per day. The Union Pacific (UP) Railroad's major coal route runs east-west through the region from Topeka into Missouri where it parallels the Missouri River. This route carries upwards of 80 trains per day of loaded unit coal trains. (A unit train is typically one mile long.) Other significant routes in the region include Kansas City Southern

(KCS) north-south route that connects to Mexico at Laredo, Texas and Norfolk Southern (NS) east-west route that ends in Kansas City. Canadian Pacific now serves Kansas City over the ICE route.

There are currently five intermodal yards in Kansas City. BNSF, KCS and NS each have one facility and UP has two facilities in the region. Along with intermodal activity there are numerous switching yards, classification yards, transload facilities and other rail operations that occur in the region. Kansas City Southern recently moved its intermodal operations to the former Richards Gebaur Airport site, which allows for more opportunities for complimentary development at the CenterPoint Intermodal Center – Kansas City. BNSF is moving its intermodal operations to Logistics Park KC in southern Johnson County, Kan., where significant warehouse space is also under development.

Kansas City International Airport (KCI) is home to the region's air cargo terminal, one of the highest-volume air freight hubs in the six-state region. KCI has plans to expand service capabilities and enhance the attractiveness of aviation facilities associated with manufacturing and industrial operations. An initial phase includes a 800-acre master planned site, the KCI Intermodal Business Centre, which could include more than 5 million square feet of distribution, air cargo and on-ramp, airport-related logistics buildings.



Source: FEMA and MARC Data and Digital Services.

Figure 2.58: Airports and Heliports

Other airports in the region with runways of sufficient length to support large aircraft for air cargo operations include Kansas City's Charles B. Wheeler downtown airport, and New Century Air Center in Johnson County (Source: MARC).

The Kansas City Port Authority operates the area's only public port, located along the Missouri River near the confluence of the Kansas and Missouri Rivers. The port is an intermodal facility, transferring freight between barge, truck, and rail. In addition, the Kansas City region benefits from numerous private ports, which are used by companies shipping commodities that include grains, sand and gravel, fertilizer, chemicals, coal and coke. Currently, river flows are managed by the U.S. Corps of Engineers' Missouri River Master Manual which limits the navigation season to approximately six months each year.

The Kansas City area is also one of the nation's top five trucking centers. Truck volumes in the region are heavily concentrated on interstates and U.S. highways. I-70 in Missouri is the most heavily traveled truck route in the region with some segments exceeding 12,000 trucks per day. The region's national freight corridors are estimated to carry approximately 70 percent of truck vehicle miles traveled **(**Center for Transportation Analysis), with historic trends indicating a high rate of growth which is likely to continue. In 2019, the regional system handled an estimated 214 million tons of freight with an estimated value of $298 billion. It is estimated that by 2045, the region will move over 295 million tons valued over $447 billion.

Table 2.14 Domestic and International Freight in Tons Through the KC Region

	Domestic and International Freight (Thousands)		% Change in Tons
Transportation Mode	**2019**	**2045 forecast**	
Truck	149,814	217,184	45%
Rail	34,237	38,089	11.3%
Water	101.8	124.865	22%
Air (include truck-air)	100	231	131%
Multiple Modes and Mail	6,418	11,219	74.8%
Pipeline	23,265	28,832	23.9%
TOTAL	**213,940**	**295,680**	**38.2%**

Source:

2.7.6 Transit Service

The five transit agencies in the Kansas City region — KCATA, Johnson County Transit, Unified Government Transit, IndeBus and the KC Streetcar — are working together to coordinate services, creating a seamless system from the rider's perspective. In October 2015, the agencies adopted the RideKC brand and create a single transit website for the entire region: RideKC.org. Ridership among these 2five systems totaled 16 million riders in 2018. Since their 2015 system coordination, the agencies have coordinated in other ways as well:

- Created one regional fare ($1.50) and standard monthly fare pass.
- Made the system free to ride for all qualified paratransit users.
- Expanded the U-Pass program from serving only University of Missouri–Kansas City students to include Metropolitan Community College and Kansas City Art Institute students.

- Made the RideKC system free for veterans.
- Began branding buses and bus stops with the RideKC colors and logo.
- Created a new RideKC system map.
- Initiated a route renumbering plan to make route numbers correspond geographically.

In 2019, the five systems served the public with 553 vehicles. Fixed-route transit is made up of buses, streetcars and other vehicles that follow prescribed routes and stop at regular, scheduled intervals. There are currently 87 bus routes and one streetcar route in the RideKC system. Each fixed-route bus belongs to one of four network categories: Fast and Frequent, 30-Minute, Express, or Other Local.

Currently, there are six existing bus routes and a streetcar line that can be considered Fast and Frequent service. These are the two bus rapid transit (BRT) routes, Main and Troost MAX, the KC Streetcar and the following bus routes:

- 71 (which runs on Prospect and will be partially replaced by the Prospect MAX BRT route that started operating in 2019)
- 39 (which runs on 39th Street)
- 31 (which runs on 31st Street)
- 24 (which runs on Independence Avenue)

(Source: MARC Smart Moves 3.0 Plan)

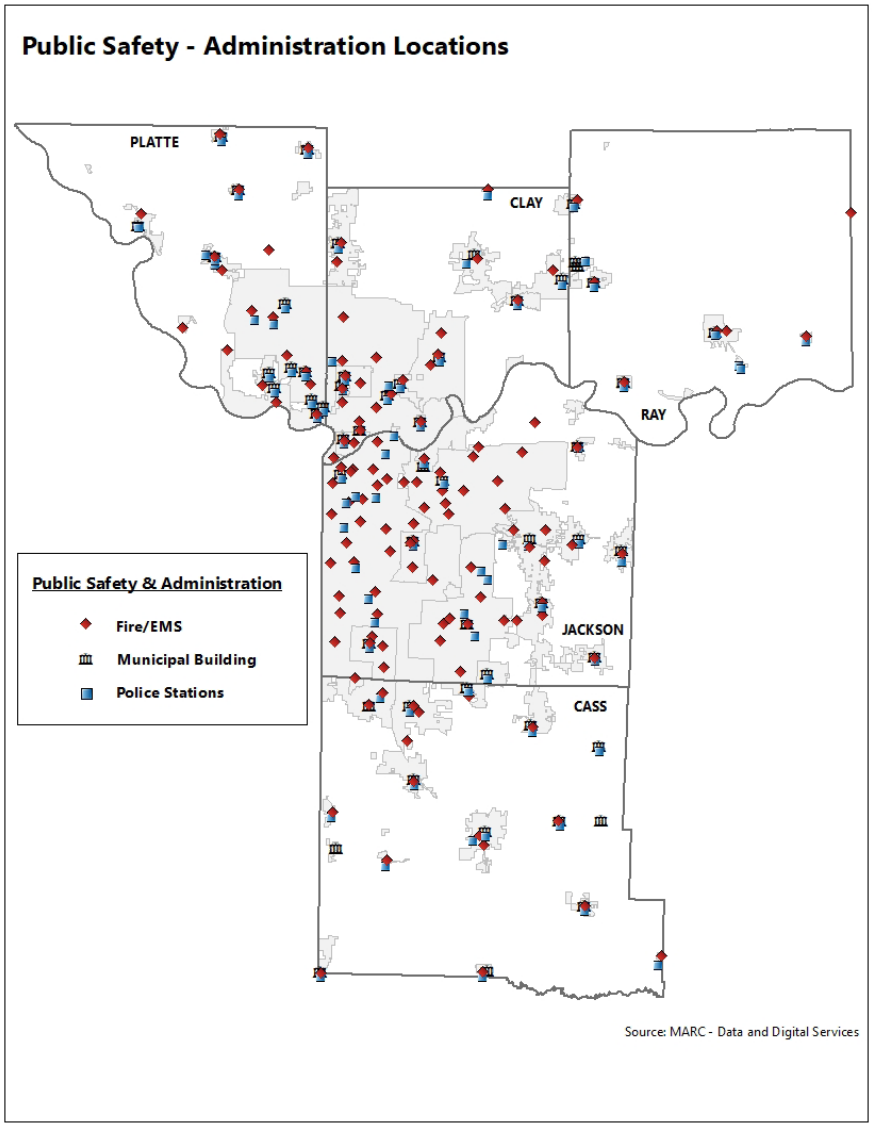
Two new extensions of the KC Streetcar to be completed in 2025 and 2026 will run from the downtown north to the Missouri River area where the new KC Current Soccer stadium opened along with major new development and south from Union Station to the Country Club Plaza and UMKC. Additional routes are being planned for an east-west corridor in Kansas City, Missouri, and a route north across the Missouri River. A recent federal transportation grant is allowing MARC to work with the Unified Government of Wyandotte County, Kansas, Kansas City, Missouri and Independence, Missouri, to plan for a connected high speed transit corridor from western Wyandotte County through Kansas City's downtown to the center of Independence.

2.7.7 Other Critical Infrastructure

Table 2.15: Critical Facility Types							
Asset (critical facility)	**Cass**	**Clay**	**Jackson**	**Platte**	**Ray**	**Planning Area**	**Kansas City**
Child Care	49	92	331	29	6	**507**	231
Nursing Home	10	21	85	12	0	**128**	72
Public Housing	0	145	574	31	84	**834**	587
School	47	84	276	37	12	**456**	193
College & University	1	6	53	7	0	**67**	48
Hospital	2	6	17	1	1	**27**	15
Other Health Facility	23	41	153	14	7	**238**	98
Police	15	16	25	17	9	**82**	13
Fire	17	26	67	17	7	**134**	37
PSAP	5	6	15	2	1	**29**	5
Local (city, county, other) Government	13	12	13	13	6	**57**	1
Shopping Center	38	117	303	36	8	**502**	186
Grocery (large, small, farmers)	13	42	142	12	1	**210**	110
Airport	13	8	10	10	4	**45**	3
Amtrak	0	0	2	0	0	**2**	1
Heliport	1	3	15	2	0	**21**	14
Hotels	8	40	133	39	0	**220**	136
Apartments	51	192	1727	101	9	**2080**	1524
Trailer Parks	5	6	10	2	0	**23**	8
Major League Sports Stadiums	0	0	3	0	0	**3**	3
Arena or Convention Center	0	0	3	0	0	**3**	2
Tier II	110	213	584	116	41	**1064**	451
RMP	6	3	9	4	4	**26**	8
Waste Water Treatment	16	13	19	16	9	**73**	7
Total	**443**	**1092**	**4569**	**518**	**209**	**6831**	**3753**

Source: MARC from city and county governments data.

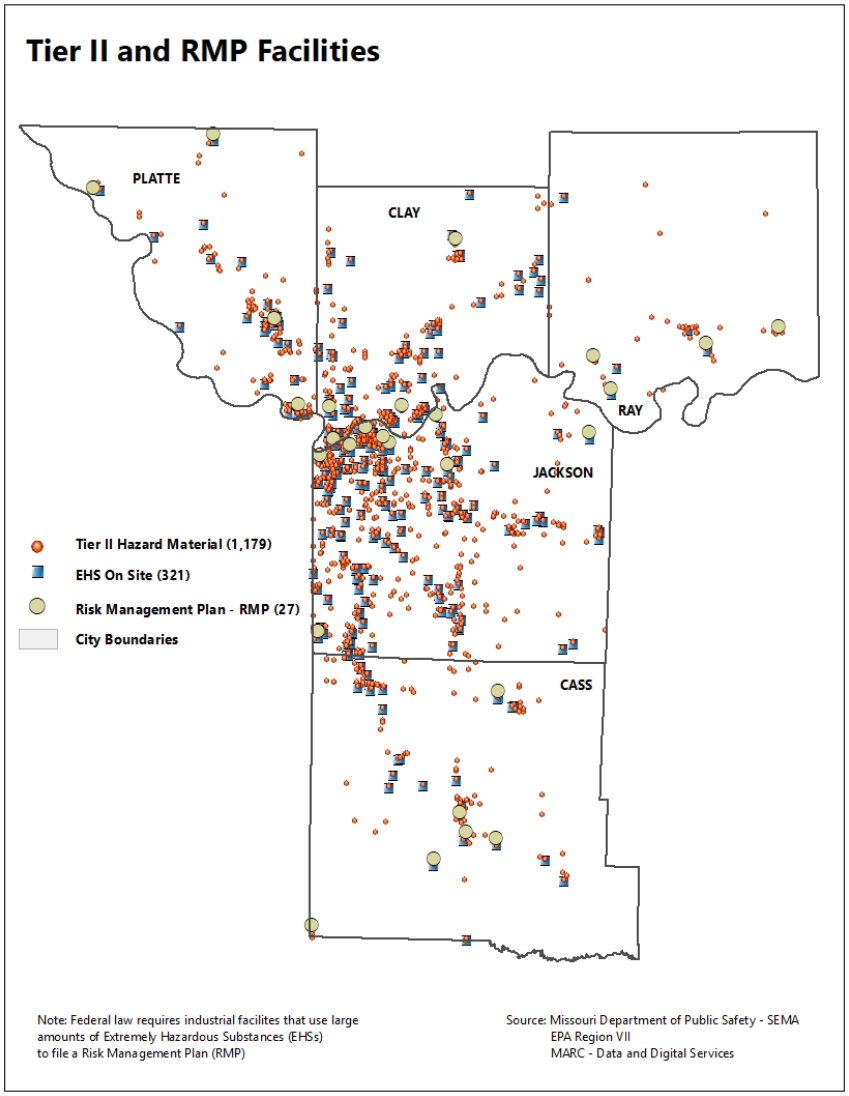
Table 2.15 demonstrates the significance of major facilities by category and county in the planning area that could be impacted by natural hazards.



Source: MARC compiled from local governments and agencies

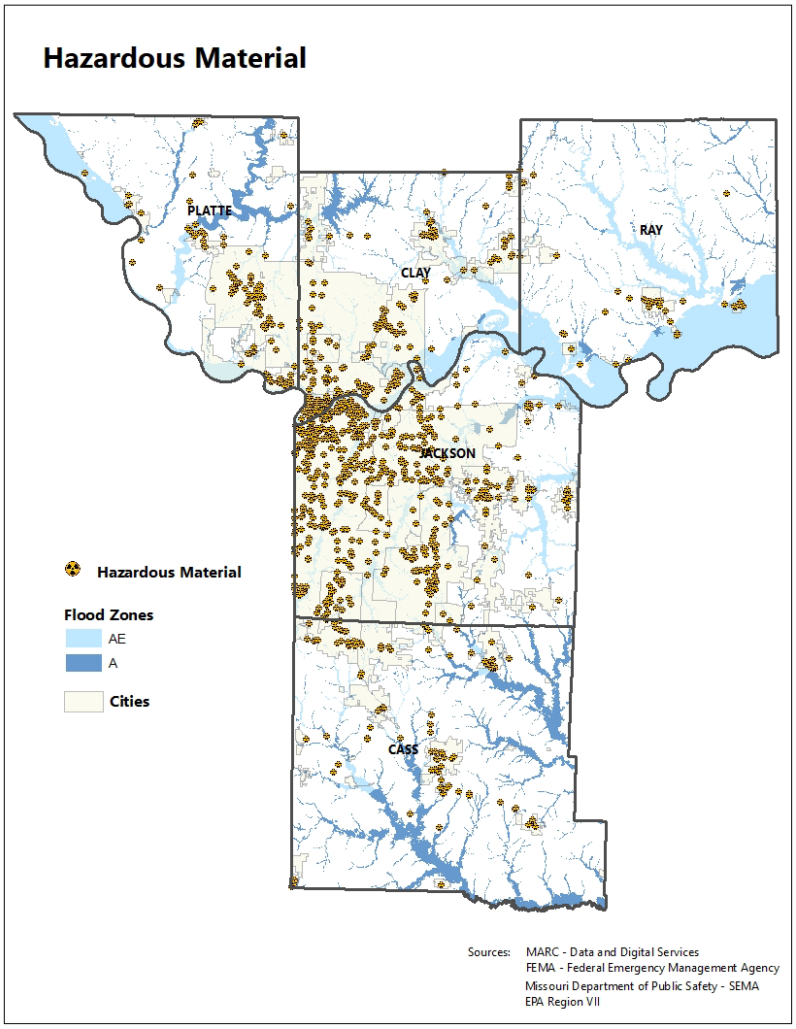
Figure 2.59: Public Safety and Administrative Facilities

The planning area has an extensive network of public safety and governmental facilities.



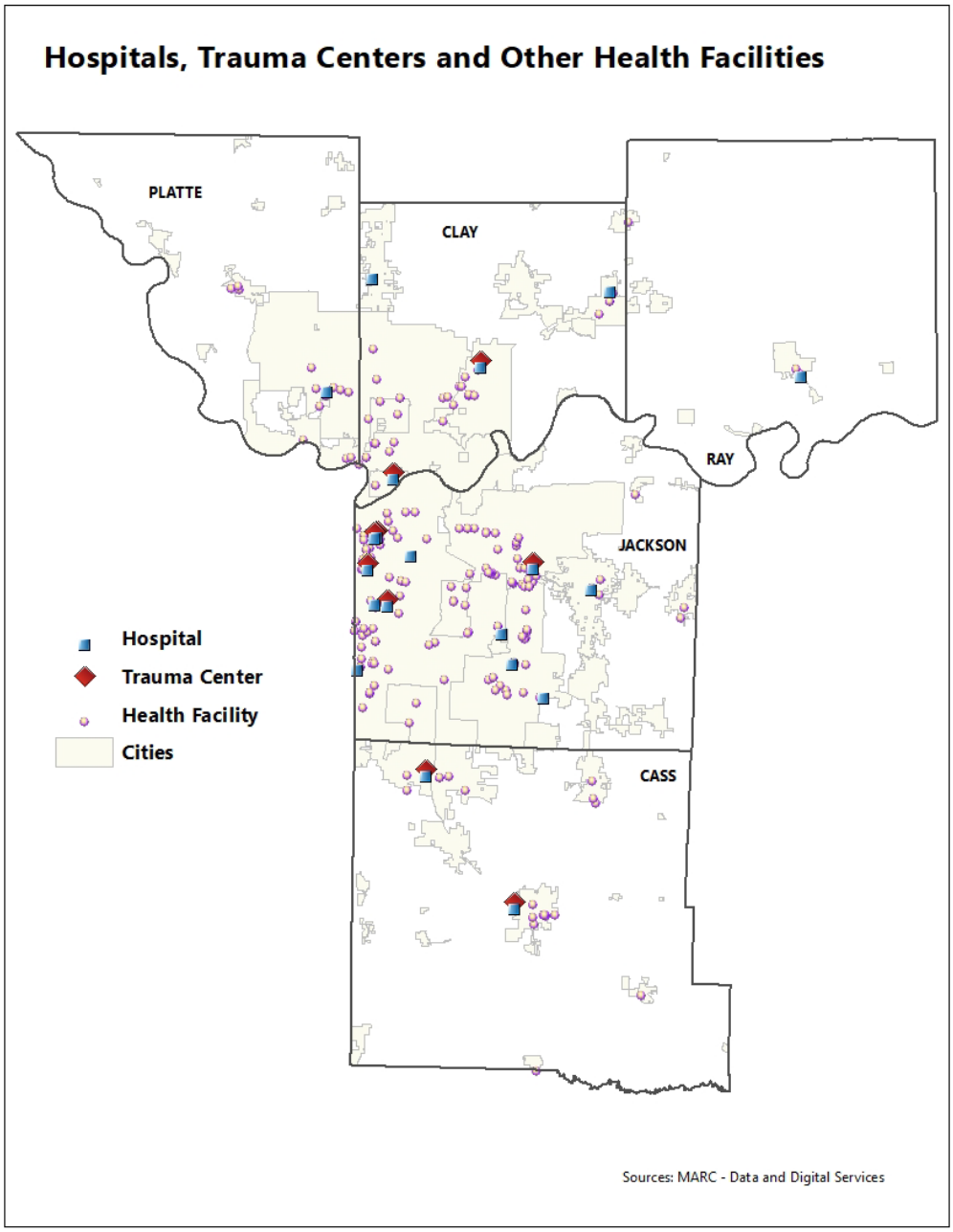
Sources: MO DPS/SEMA, EPA Region VII, MARC

Figure 2.60: Tier II and RMP Facilities



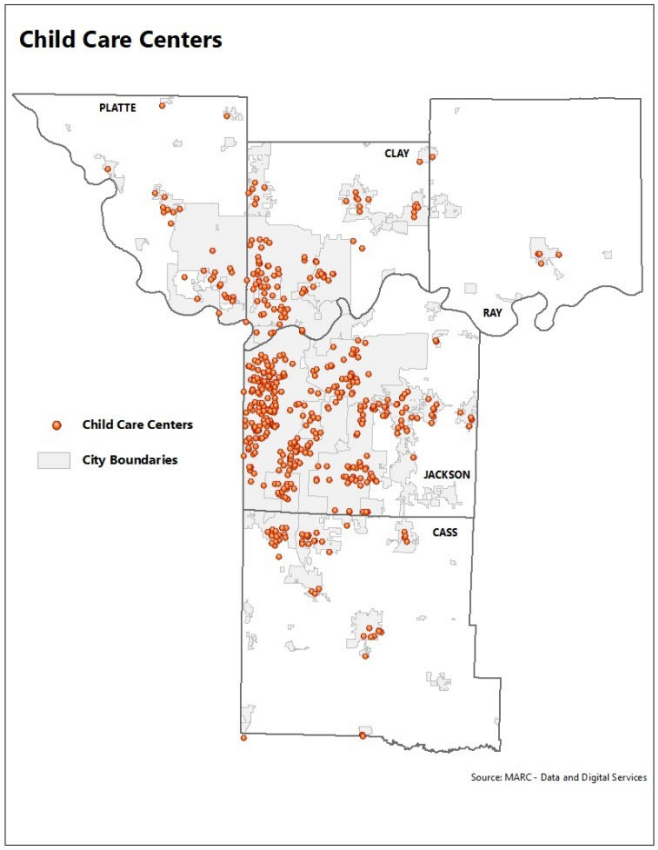
Source: MARC, FEMA, MO DPS/SEMA

Figure 2.61: Chemical and Hazardous Materials



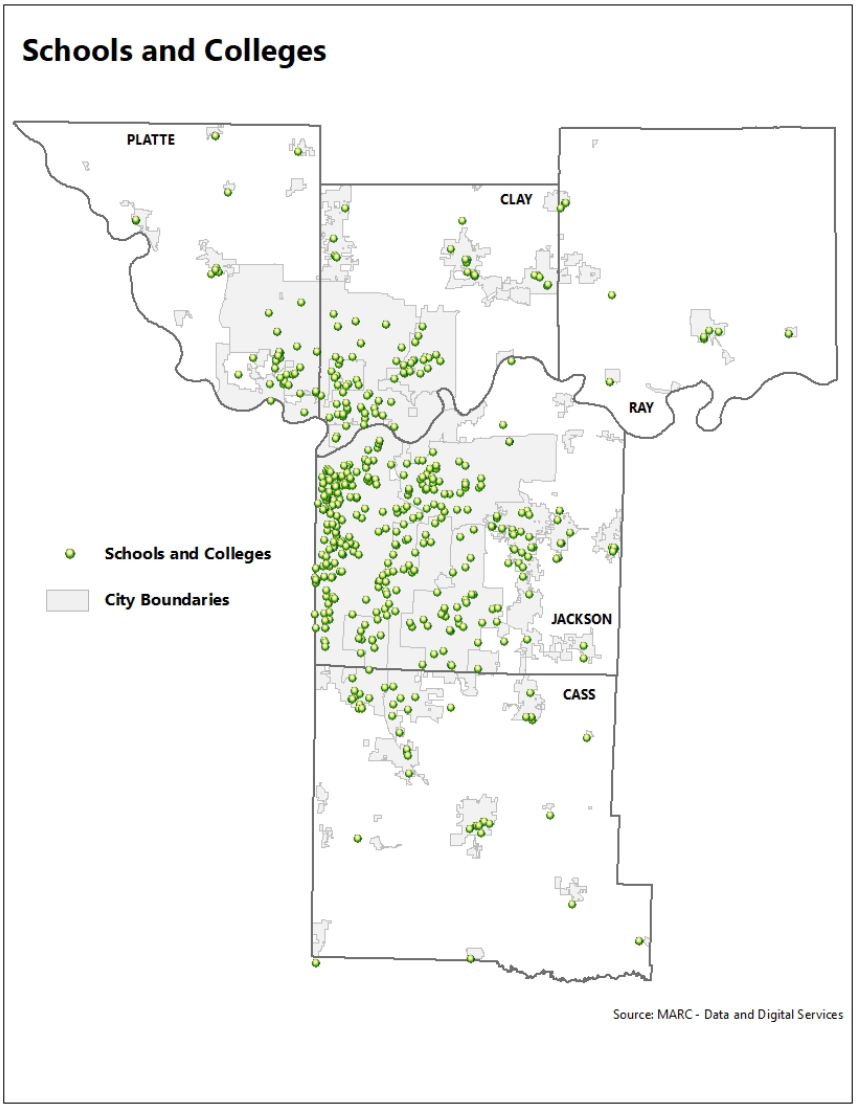
Source: MARC

Figure 2.62: Hospitals, Trauma Centers, and Other Health Facilities



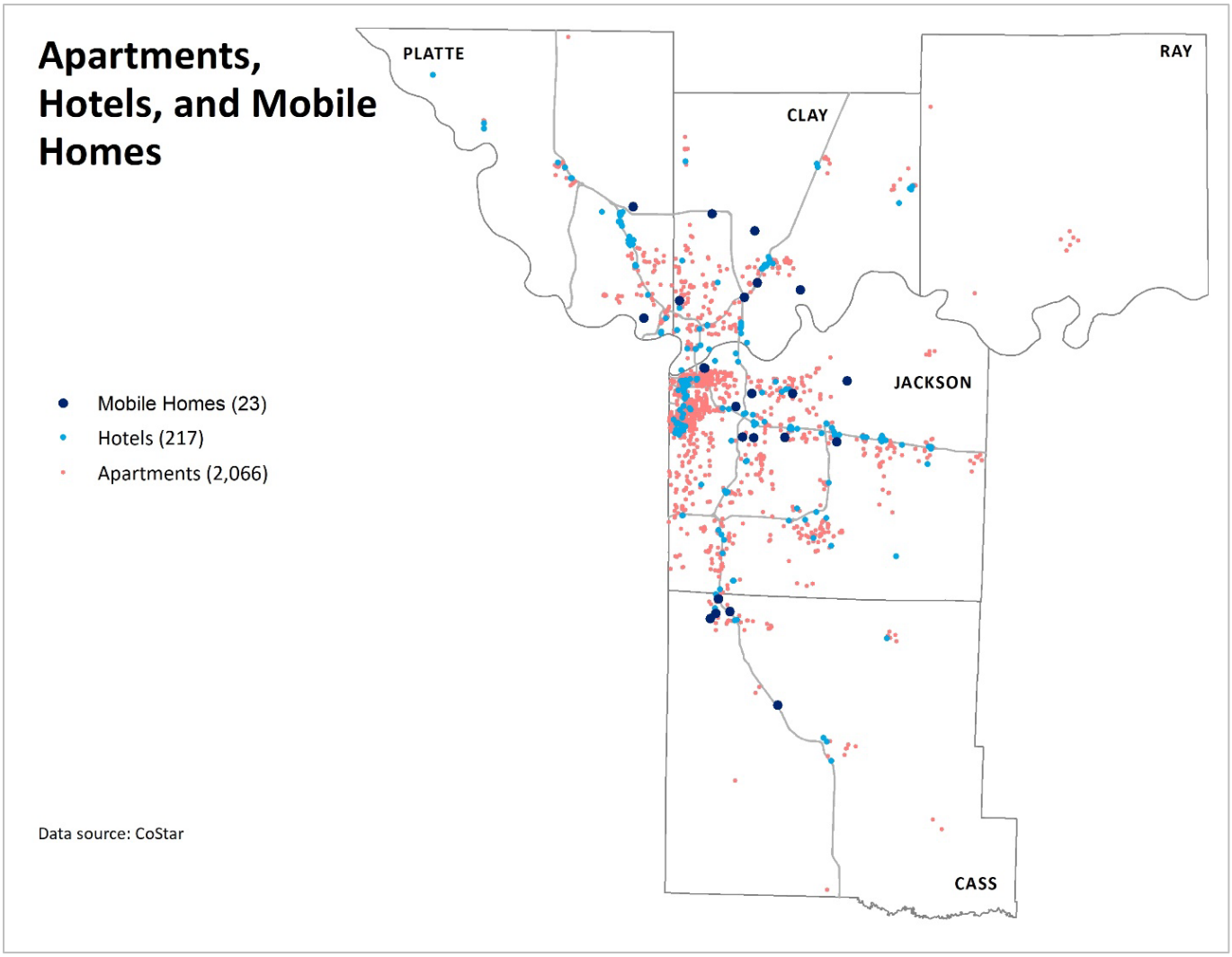
Source: MARC

Figure 2.63: Child Care Centers



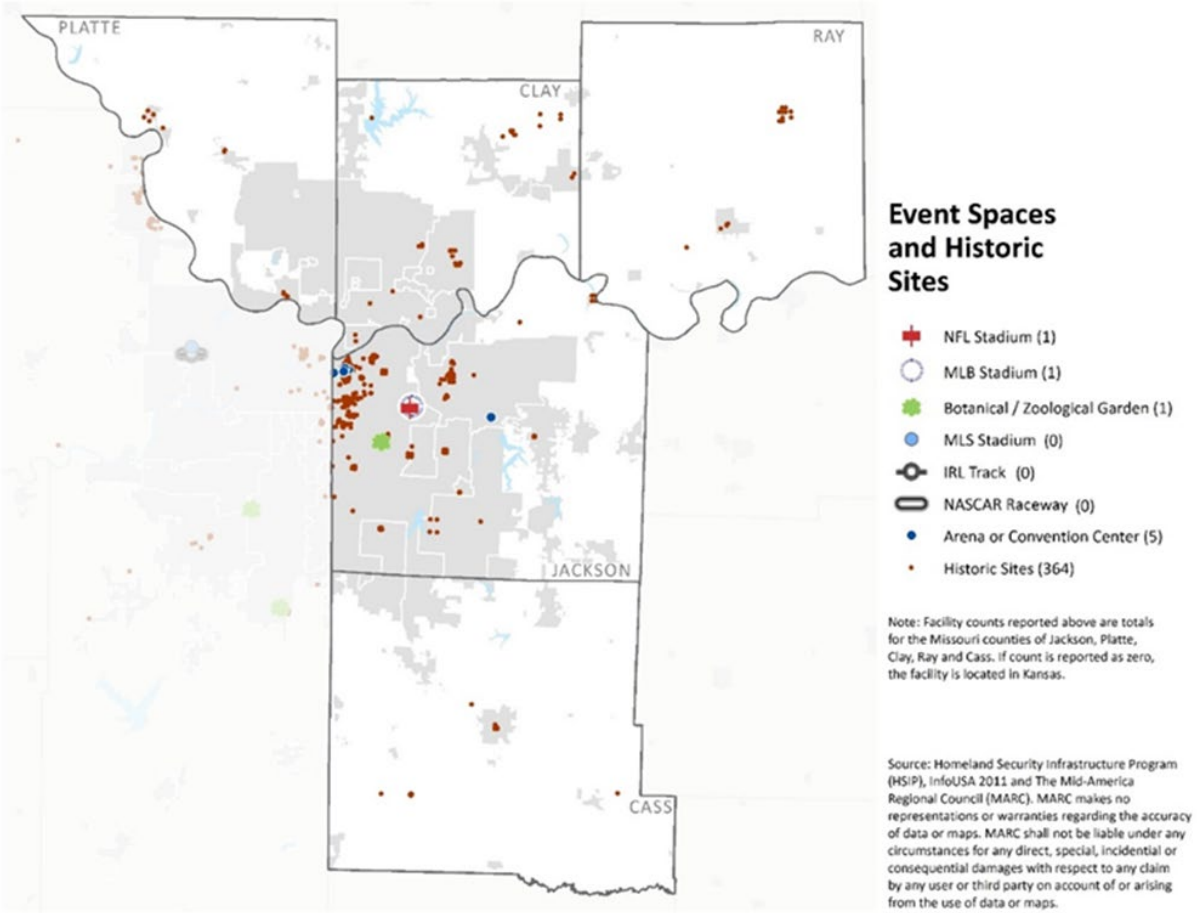
Source: MARC

Figure 2.64: Schools and Colleges/Universities



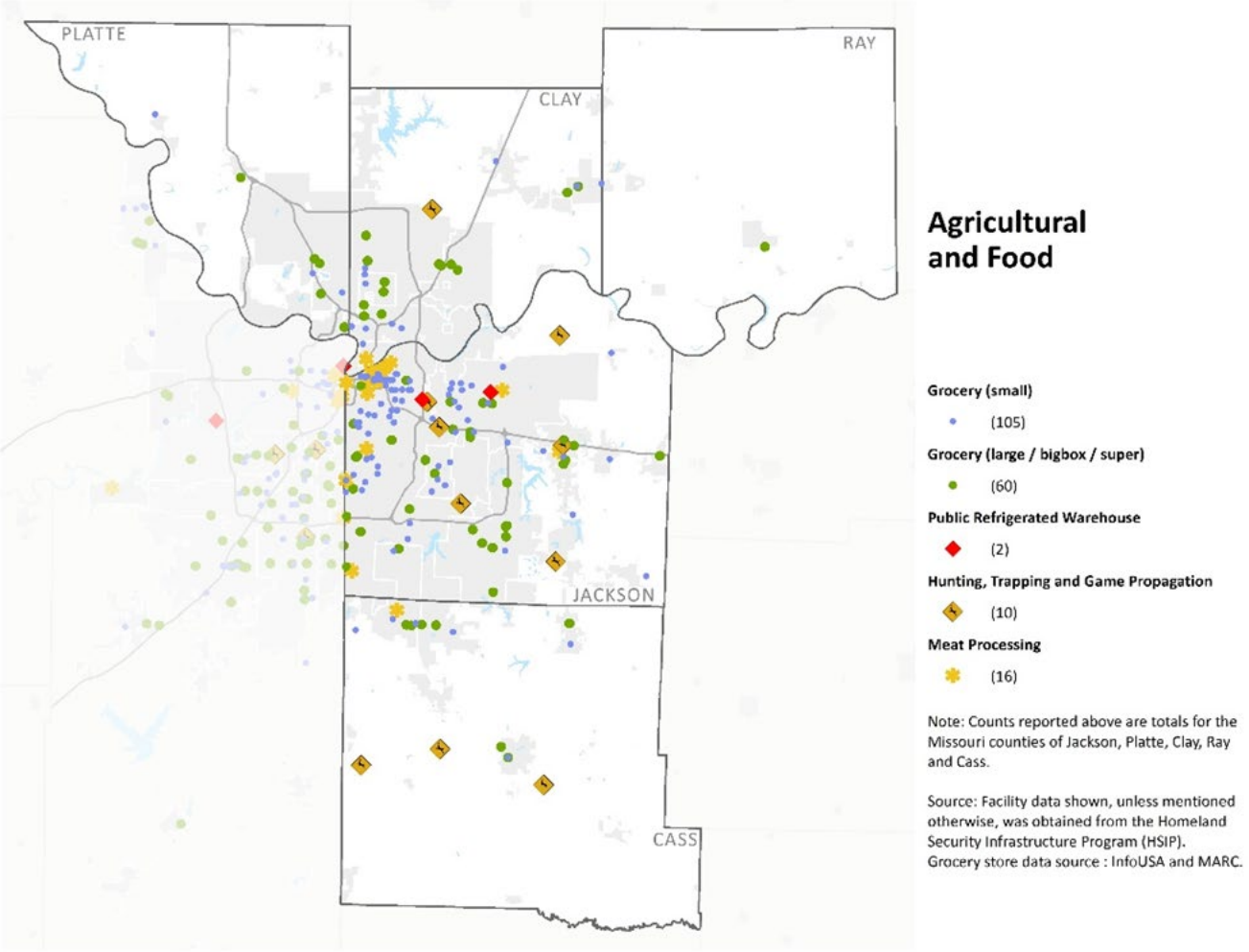
Source: Co-Star, local governments

Figure 2.65: Apartments, Hotels, and Mobile Homes



Source: City and county governments

Figure 2.66: Event Spaces and Historic Sites



Source: City and county governments

Figure 2.67: Agricultural and Food Facilities

Vulnerable Populations

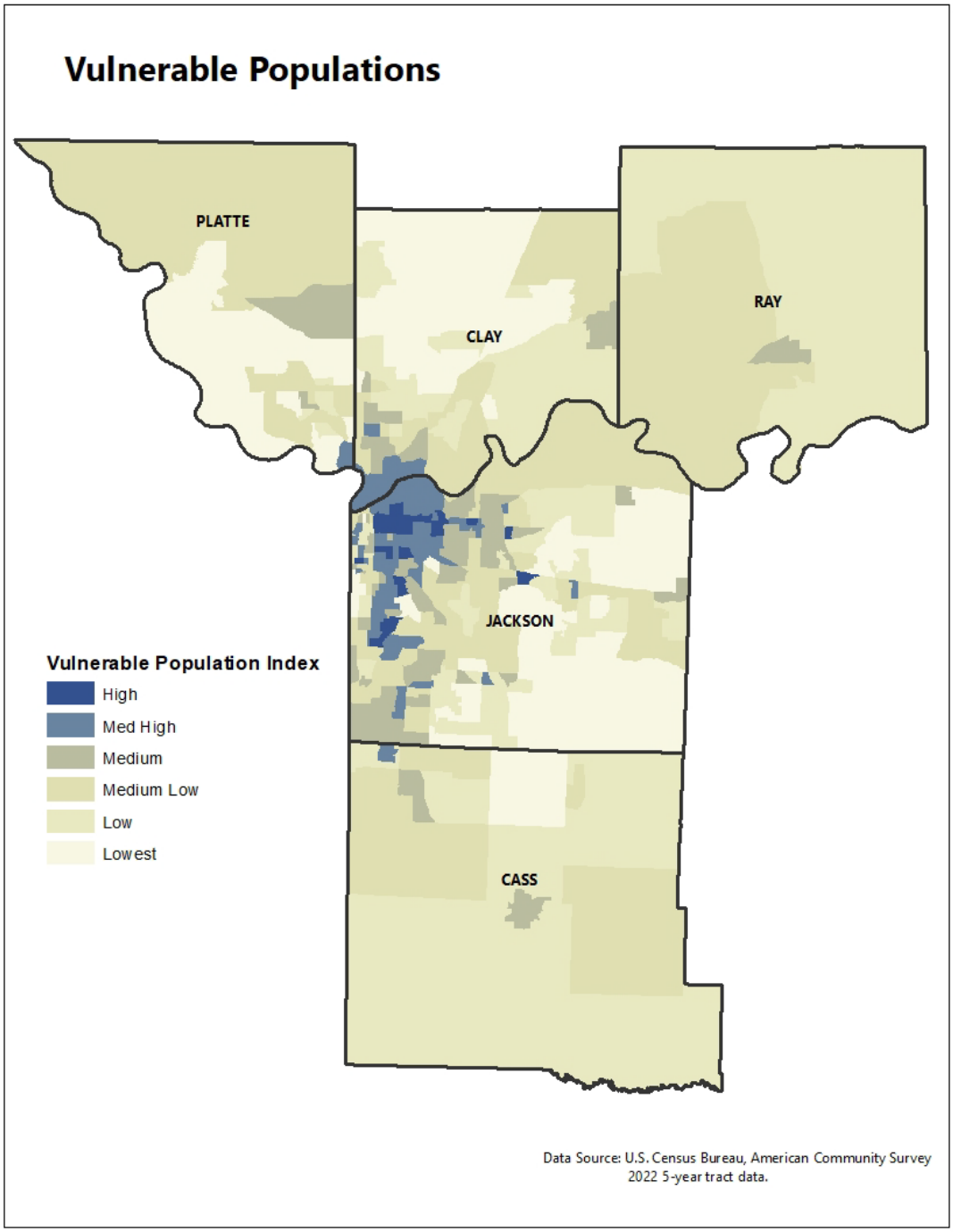
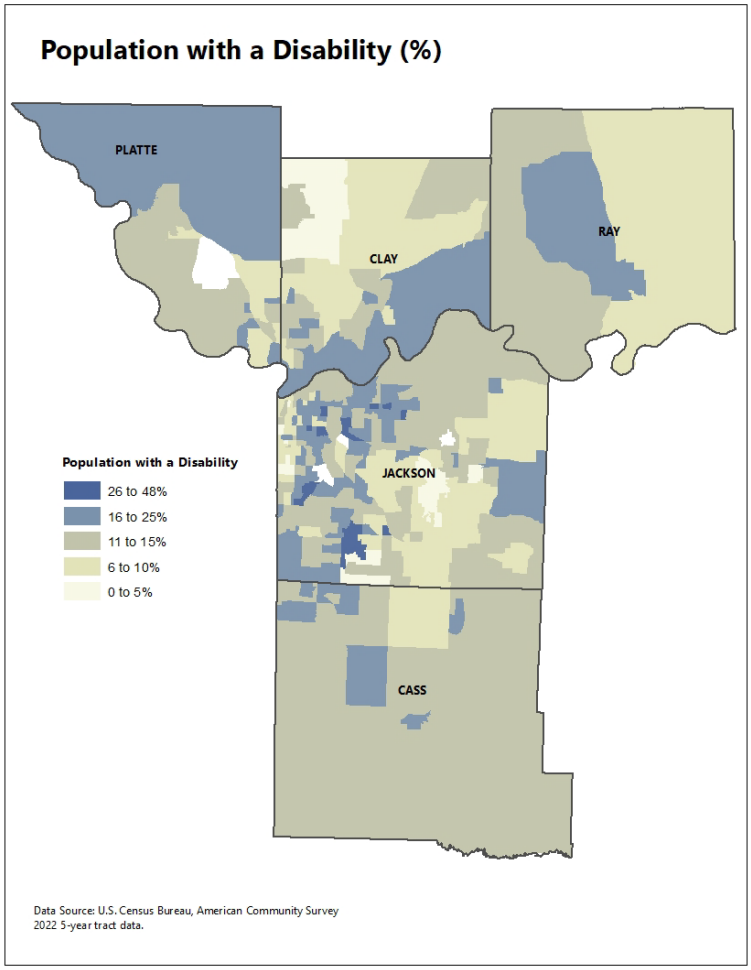


Figure 2.68: Vulnerable Populations in Planning Area by Census Tract Prepared by MARC

Vulnerable populations are those at-risk due to low income, lack of health insurance, minority status, social determinants of health such as housing instability and food insecurity, and those very young children and older adults.



Source: US Census Bureau, ACS 2022 5-year data

Figure 2.69: Map of Population with a Disability (%) of Persons in Census Tracts

The Census Bureau's 2017-2021 American Community Survey found 150,000 disabled residents in the 5-county planning area, representing about 12 percent of all persons. Disabled persons have sight, hearing, physical mobility or cognitive challenge abilities. Jackson County had the largest disabled population at over 90,000 persons representing 12.7 percent of that county's population. Cass and Ray counties had the largest proportion of disabled population at 13.7 and 13 percent, respectively.

Source: Kansas City Regional Digital Equity Plan, May 2023
https://www.marc.org/document/kansas-city-regional-digital-equity-plan

Adults with less than a high school education are often unemployed or hold a low-paying job. Of those adults 25 years and older in the 5-county planning area, 59,202 did not have a high school education. This ranged from 9.8 percent of the Ray County adult population to a low of 3.3 percent in Platte County.

Figure 2.70 Map of Adults with Less than a High School Education

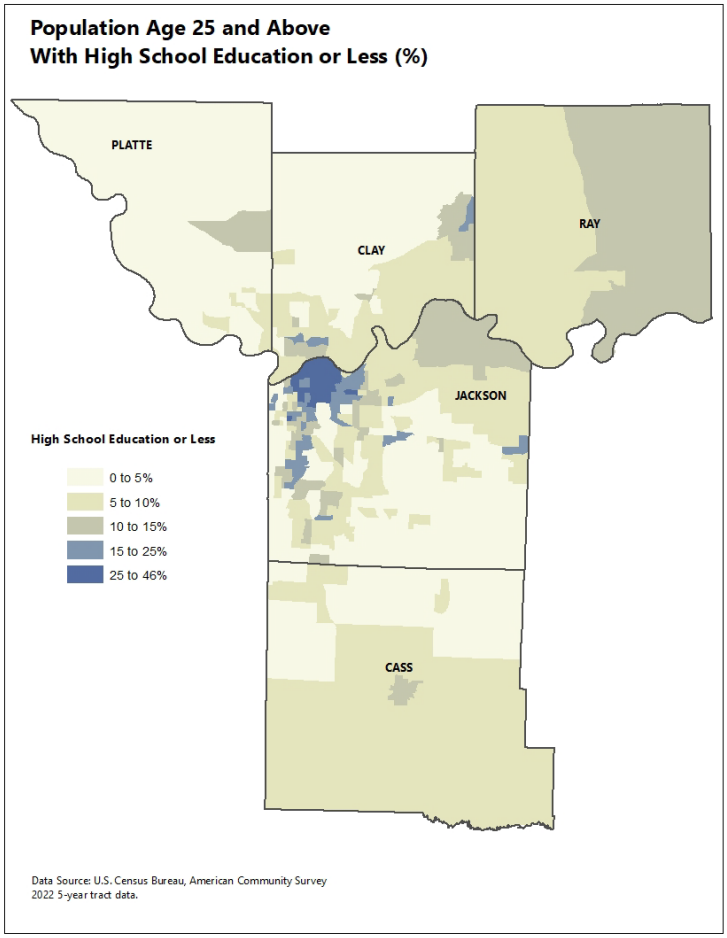
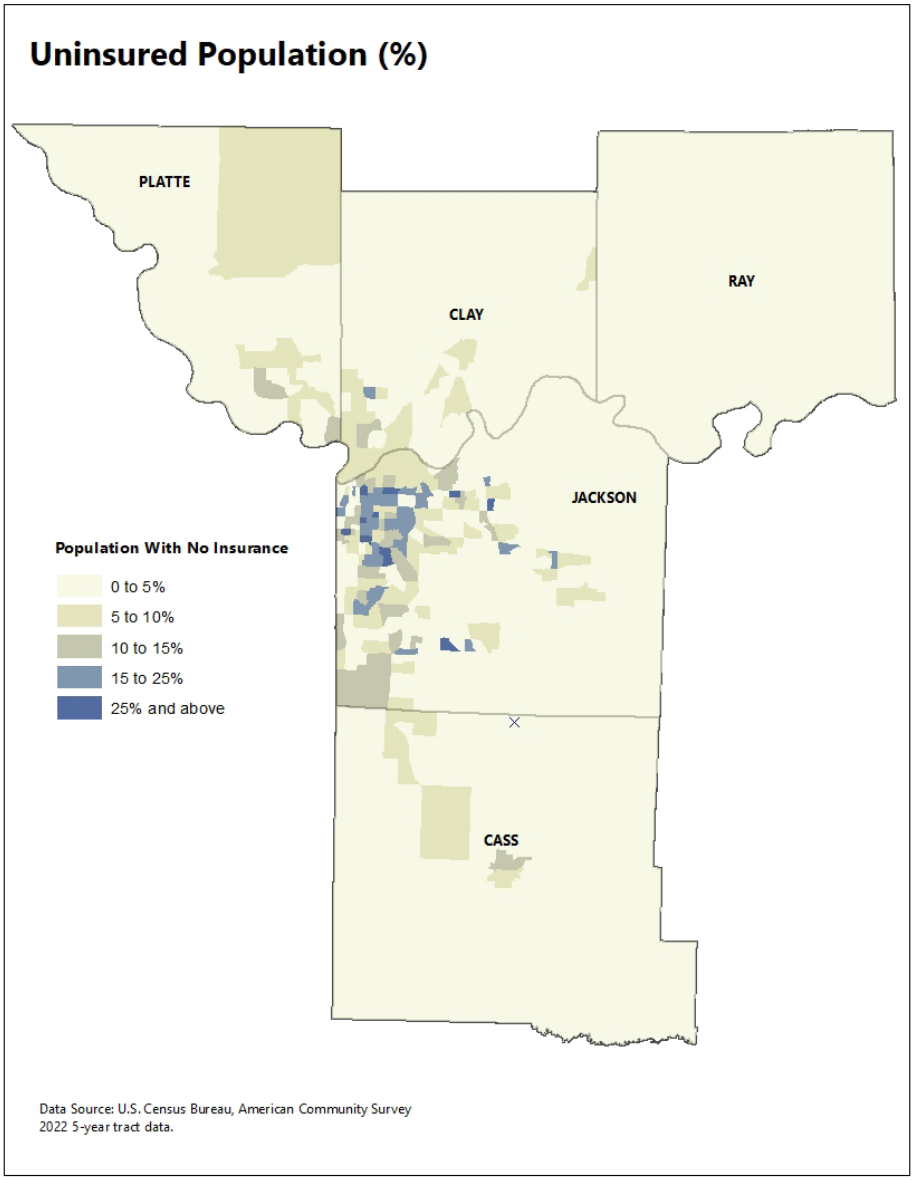


Figure 2.71: Persons without Health Insurance (Percentage of those in Census Tracts)



There were 116,230 persons in the 5-county planning area without health insurance in 2023. Jackson County had both the largest number and greatest proportion of its population without coverage, 80,615 people and 11.3 percent of all persons.

Chapter 3: Capabilities Assessment

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Chapter 3: Capabilities Assessment

The purpose of the capabilities' assessment is to identify and consider each community's unique set of capabilities that currently reduce disaster losses or could be used to reduce losses in the future. For the purposes of this plan "community/jurisdiction" is used interchangeably and refers to all plan participants – cities, counties, special districts, school districts, colleges and universities. Capabilities include policies, plans, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability.

3.1 Data Gathering Methods

To facilitate data gathering from the participating jurisdictions, online profile surveys were developed for communities and school districts based on the FEMA Capabilities Worksheets 4.1-4.3.[i] The survey instruments were created as online tools. Community and school profile survey instruments are included in **Appendix F**.

The survey tools collected information on the hazards communities face, their capabilities to support development and implementation of Mitigation Strategies, (**See Section 5: Mitigation Strategy**), existing planning mechanisms that were incorporated in the hazard mitigation planning process, information on how their jurisdiction might carry out safe growth and plans and policies and actions to demonstrate continued compliance with the requirements of the National Flood Insurance Program (NFIP).

The following subsections provide highlights from both community and school profile surveys completed by the 2025 Plan update participants. Sections 3.3.1 through 3.3.6 apply only to cities and counties; Section 3.3.7 applies only to school districts, colleges and universities.

3.3.1. Planning and Regulatory Capabilities
3.3.2. Administrative and Technical Capabilities
3.3.3. Financial Capabilities
3.3.4. Education and Outreach Capabilities
3.3.5. Safe Growth Audit
3.3.6. Floodplain Management and NFIP Participation
3.3.7. School District Capabilities

Key observations:

The profile represents a snapshot of a community's mitigation capabilities and provides the foundation for inclusive mitigation planning. The 2025 profile survey used the 2020 plan survey tools as a foundation and was more comprehensive than prior assessments. As a result in some cases, the tools allowed for increased overall awareness of the variety of community plans that intersect with mitigation intent.

Planning and Regulatory: An added benefit of compiling this information into a regional plan is it allows a jurisdiction to compare their responses to other jurisdictions. This can be especially valuable for those jurisdictions who may not previously have considered developing or adopting the referenced plans for their own community or school district. It may offer opportunities in the future to expand mitigation planning efforts and reinforce successful implementation. The survey results also illustrate the complexity of planning within and across jurisdictions.

Administrative and Technical: Many jurisdictions possess a number of technical and administrative tools to support ongoing mitigation efforts. Codes, policies and ordinances can be extremely effective tools available to local government to control, to the extent possible, negative impacts from a variety of hazards. This is especially true for floodplain management, where most jurisdictions indicate they have effective measures in place. Smaller jurisdictions have more limited access to these tools, but generally also have more limited exposure to hazard risks. While nearly every jurisdiction has emergency management staff, 35 percent of these personnel are part-time. Small communities rely on their county emergency manager for guidance and support.

Financial: Most jurisdictions are leveraging existing capabilities in order to be able to fund mitigation projects. A strong motivating factor for most jurisdictions is the opportunity to apply for FEMA or other grants to help support the implementation of specific investments to mitigate future risks.

Education and Outreach: Over the last several decades, the region has built and continues to build a robust alert and warning system. With the advent of social media and opportunities for broad text messages, alert systems have been able to be customized for individual user experience. The increased use of systems to enable mobile devices and computers to receive alerts increases public awareness, but too many messages may reduce effectiveness as some members of the public may ignore alerts altogether. The increased alert options have also created new avenues for residents to participate in and take more responsibility for their own preparedness. Local officials suggested that by working together, jurisdictions could review available tools and cooperatively procure systems to save money and standardize operations.

Regional collaboration continues to expand and can be an effective tool for leveraging limited resources, and most of the planning area's local governments participate in a variety of regional committees and community partnerships. There may be opportunities to increase participation by schools in regional work.

Data limitations: Survey responses are the best available information reported by the jurisdiction or school at the time of the survey. Completion of the survey should not be interpreted to mean the information itself is complete or accurately reflects the current status of the capability. Limitations of the survey tool include the inability to accurately interpret false statements; therefore, data marked as false is depicted as blank or as not reported in the following summary tables. In some cases, the lead contact person completing the surveys may not have full knowledge of plans and policies adopted through other departments or offices.

Weather Adaptation: Many jurisdictions are focusing more attention on the increased impacts from more extreme weather conditions; however, many smaller jurisdictions are challenged in considering increased risks along with their ongoing needs to maintain infrastructure and serve their constituents.

Table 3.1: Adopted or Updated Plans and Policies

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Cass County	Belton		Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore
Comprehensive/Master Plan	2010	1992		2022		2014	2015	2022	**2014**
Capital Improvement Plan		2014		2024		2014	2019	2024	**2014**
Local Emergency Operations Plan	2023	2014		2022		2014	2019	2016	**2018**
Continuity of Operations Plan	2010	2014		2014		2019	2019		
Public Health Emergency Plan	2023								**2014**
Storm Water Management Plan	2007	2011		2023		2014	2018	2013	**2002**
Community Wildfire Protection Plan or Burn Ordinance	No	No		No	No	No	Burn	Burn	Burn
Brownfields Redevelopment	No	No		No	No	No	No	No	No
Climate Change Adaption	No	No		No	No	No	No	No	No
RELATED PLANNING ACTIVITIES:									
Building Codes adequately enforced	Yes	Yes		Yes	No	Yes	Yes	Yes	Yes
Land Use Planning utilized by community	Existing & Future	Existing & Future		Existing & Future	No	Existing & Future	Existing & Future	Existing & Future	Existing & Future
Zoning Ordinance	Yes	yes		Yes	Yes	Yes	Yes	Yes	Yes
Subdivision Ordinance	Yes	Yes		Yes	No	Yes	Yes	Yes	Yes
Natural Hazard-related Ordinance(s) adopted	Stream setback Soil & erosion Floodplain mgmt. Stormwater runoff	Stream setback Soil & erosion Floodplain mgmt. Stormwater runoff; open space dedication		Soil & erosion Floodplain mgmt. Stormwater runoff; open space dedication	Floodplain mgmt.; open space dedication	Soil & erosion Floodplain mgmt. Stormwater runoff	Soil & erosion Floodplain mgmt Stormwater runoff; open space dedication	Floodplain mgmt. Stormwater runoff; open space dedication	Stream setback Soil & erosion Floodplain mgmt. Stormwater runoff; open space dedication

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	North Kansas City	Smithville	Pleasant Valley
Comprehensive/Master Plan	2008	2024	2024	2016	2017	1999	2022	2020	
Capital Improvement Plan		2019	2024				2024	2024	
Local Emergency Operations Plan	2023	2022	2024	2009	2016	2012	2024	2022	Yes
Continuity of Operations Plan	2024	2022	2024	2009		2012			
Public Health Emergency Preparedness Plan	2020	2022	2024				2024		
Storm Water Management Plan		2013	2024		2003		2023	2023	
Community Wildfire Protection Plan or Burn Ordinance	No	Yes	Yes	Yes		Yes	No	Yes	
Brownfields Redevelopment	No	No	No	No		No	No	No	
Climate Change Adaption	No	No	yes	No		No	No	No	
RELATED PLANNING ACTIVITIES:									
Building Codes adequately enforced	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Land Use Planning utilized by community	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing	Existing & Future	Existing & Future	Existing & Future	
Zoning Ordinance	Yes	yes	Yes	Yes	Yes	Yes	Yes	Yes	
Subdivision Ordinance	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Natural Hazard-related Ordinance(s) adopted	Stream setback Soil & erosion Floodplain mgmt Stormwater runoff	Water mgmt. Stream setback Soil & erosion Floodplain mgmt Stormwater runoff	Floodplain mgmt Stormwater runoff	Floodplain mgmt Stormwater runoff	Stormwater mgmt floodplain management	Stream setback Soil & erosion Floodplain mgmt	Soil & erosion Floodplain mgmt Stormwater runoff	Soil & erosion Floodplain mgmt Stormwater runoff	Soil & erosion Floodplain mgmt

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Jackson County	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lees Summit	Oak Grove	Raytown	Central Jackson County FPD	Sni Valley FPD
Comprehensive/Master Plan	2014	2015	2020		2018	2022	2021	2021	2025	NA	2023
Capital Improvement Plan	2010	2024	2024		2015	2024	2024	2024	2006		
Local Emergency Operations Plan	2014	2014	2013	2007	2015	2020	2021	2024	2014		2007
Continuity of Operations Plan	2012				2015	2019					
Public Health Emergency Preparedness Plan	2013				2024	2019					
Storm Water Management Plan	2013	2018	2018			2019	2024	2004	2023		
Community Wildfire Protection Plan or Burn Ordinance	Yes	Yes	No	Burn	Yes	No	Yes	Yes	No	Yes	Yes
Brownfields Redevelopment	No	No	No	No	No	2015	No	No	No	No	No
Climate Change Adaption	No	No	No	No	No	Yes	No	No	No	No	No
RELATED PLANNING ACTIVITIES:											
Building Codes adequately enforced	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	NA	NA
Land Use Planning utilized by community	Existing Future	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing & Future		Existing & Future
Zoning Ordinance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	NA
Subdivision Ordinance	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	NA	NA
Natural Hazard-related Ordinance(s) adopted		Stream setback Floodplain mgmt. Stormwater runoff Soil & erosion	Stream setback floodplain mgmt. stormwater runoff soil & erosion	Floodplain mgmt.; open space dedication	Stream setback floodplain mgmt. stormwater runoff soil & erosion	Stream setback Floodplain mgmt. stormwater runoff soil & erosion	Stream setback floodplain mgmt. stormwater runoff soil & erosion	Stream setback floodplain mgmt. stormwater runoff soil & erosion	Floodplain Mgmt Soil & Erosion; stormwater runoff, open space dedication	NA	NA

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Platte County		Farley	Ferrelview		Lake Waukomis	Northmoor	Parkville
Comprehensive/Master Plan	2010			2013			2010	2019
Capital Improvement Plan	2015					2024		2019
Local Emergency Operations Plan	2023			2013		2024	2010	2015
Continuity of Operations Plan	2023					2020		2015
Public Health Emergency Preparedness Plan	2019					2019		2015
Storm Water Management Plan	2000					2024		2019
Community Wildfire Protection Plan or Burn Ordinance	No		No	No		Burn	No	No
Brownfields Redevelopment	No		No	No		No	No	No
Climate Change Adaption	No		No	No		No	No	No
RELATED PLANNING ACTIVITIES:								
Building Codes adequately enforced	Yes		Yes			Yes	Yes	Yes
Land Use Planning utilized by community	Existing and Future		Existing				Existing	Existing & Future
Zoning Ordinance utilized by community	Yes		Yes	Yes		Yes		Yes
Subdivision Ordinance utilized by community	Yes							Yes
Natural Hazard-related Ordinance(s) adopted	Stormwater runoff Floodplain mgmt. Stream setback soil & erosion		Floodplain mgmt	Floodplain mgmt		Floodplain mgmt.	Stormwater runoff; Floodplain mgmt.	Stormwater runoff Floodplain mgmt Stream setback Soil & erosion

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD
Comprehensive/Master Plan	2020		2024		2020	2003	NA	NA
Capital Improvement Plan	2015		2024		2014	2014		
Local Emergency Operations Plan	2020	2024	2009		2009	2010		
Continuity of Operations Plan	2019	2024			2009			
Public Health Emergency Preparedness Plan	2020	2024						
Storm Water Management Plan	2012	2024	2018		2020			
Community Wildfire Protection Plan or Burn Ordinance	Yes	Yes	Yes	Yes	Yes			
Brownfields Redevelopment	No	No	No	No	No		No	No
Climate Change Adaption	No	No	No	No	No		No	No
RELATED PLANNING ACTIVITIES:								
Building Codes adequately enforced	Yes	Yes	Yes	Yes	Yes	Yes	NA	NA
Land Use Planning utilized by community	Existing & Future	Existing	Existing & future		Existing & future	Existing & future		
Zoning Ordinance utilized by community	Yes		Yes			Yes		
Subdivision Ordinance utilized by community	Yes		Yes			Yes		
Natural Hazard-related Ordinance(s) adopted	Stormwater runoff Floodplain mgmt. Stream setback Soil & erosion	Stormwater runoff	Stormwater runoff, floodplain Mgmt. soil & erosion	Stormwater runoff, floodplain Mgmt. soil & erosion	Stormwater runoff, floodplain Mgmt. soil & erosion water conservation			

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN:	Ray County	Richmond
Comprehensive/Master Plan	1998	2022
Capital Improvement Plan		2019
Local Emergency Operations Plan	2017	2024
Continuity of Operations Plan		
Public Health Emergency Preparedness Plan		
Storm Water Management Plan	2005	2023
Community Wildfire Protection Plan	No	Yes
Brownfields Redevelopment	No	No
Climate Change Adaption	No	No
RELATED PLANNING ACTIVITIES:		
Building Codes adequately enforced	Yes	Yes
Land Use Planning utilized by community	Existing & Future	Existing & Future
Zoning Ordinance utilized by community	Yes	Yes
Subdivision Ordinance utilized by community	Yes	Yes
Natural Hazard-related Ordinance(s) adopted	Floodplain mgmt Stormwater runoff Soil & erosion Stream setback	Floodplain mgmt. Stormwater runoff Soil & erosion Stream setback

3.2 Review and Incorporation of Existing Plans

In accordance with statutory requirements, the plan must describe each jurisdiction's existing authorities, policies, programs, and resources available to accomplish hazard mitigation. **Table 3.2** highlights how specific plans are being utilized by jurisdictions throughout the planning area to support and enhance mitigation activities.

Table 3.2: Local Plans and Regulations Adopted by Local Jurisdictions

Plan or Regulation	Significance to Hazard Mitigation
Emergency Management Plans (EOP)	Assists local jurisdictions in clarifying roles and responsibilities prior to, during and following a disaster. EOPs include or reference the policies and procedures and authorities to support emergency response and initial recovery that are in place. EOP helps identify resources prior to and during an emergency, including natural hazard events. A jurisdiction's EOP is a document that assigns responsibility for carrying out specific actions that exceed routine responsibility at projected times and places during an emergency. The EOP identifies the lines of authority, organizational relationships and outlines steps for coordination strategy. The EOP describes how people and property are protected and identifies resources available within the jurisdiction or by agreement with other jurisdictions. The EOP facilitates prevention, protection, response, and short-term recovery, which sets the stage for successful long-term recovery. These plans help local jurisdictions assess locations of vulnerable populations and areas within their communities and how to address these areas during an emergency. This plan is a good source of information for local risk assessment activities. Some of the recommendations considered for the Goals and Strategies section of the Hazard Mitigation Plan could be incorporated as actions in the EOP.
Floodplain Management Regulations/Ordinance	Assists jurisdictions in effectively managing floodplain areas. These regulations are usually part of a jurisdiction's land use regulations. Depending on the jurisdiction, regulations may take the form of a stand-alone municipal or county ordinance. Regulations may require specific minimum design, construction, or development elements; compliance required for health and safety reasons. These regulations are important to communities to comply with participation in the Federal Flood Insurance Program, limiting development in 100-year floodplain areas.
Land Use Regulations (e.g., zoning regulations, subdivision regulations, storm water regulations stream setback)	Primary tools for jurisdictions to shaping the character and development of a community. Land use regulations may restrict certain land use or structures from being located in hazard vulnerable areas. These regulations may also require specific minimum design, construction, or development elements; compliance required for health and safety reasons. Stream setback ordinances require development to be located at farther distances from streams or rivers and the 100-year floodplain in order to increase area for stormwater runoff to be absorbed before entering waterways.
Plan or Regulation	**Significance to Hazard Mitigation**
Wetland Regulations	Helps jurisdictions maintain and protect the integrity of wetland resources. Local wetland areas often coincide with FEMA-delineated floodplain areas. These areas often include important natural resources or habitat for wildlife.
Local Building Codes	Critical tools to maintain adequate safety and building integrity factors in construction. These codes may limit structure size, type, and place additional requirements in the construction of structures located in an identified hazard area (i.e., high wind, floodplain, wildland/urban interface area, etc.). Energy codes provide standards for construction to improve comfort during cold or heat weather and to conserve energy costs.

To demonstrate compliance, the following represents how jurisdictions reviewed and integrated the following topics into the 2025 Plan review process. Responses displayed in Table 3.3 were gathered from the community profile survey relative to plans and regulations.

- Types of natural hazards that affect or concern local governments
- Plans related to natural hazard mitigation, land use or development
- Local ordinances related to natural hazard mitigation
- Building, fire and related codes
- Participation in federal hazard mitigation programs, e.g., NFIP, FMA, PDM
- Existing mitigation practices
- Use of technical documents

Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)	
CAPABILITY	**CASS COUNTY**
Capital Improvements Plan	Pleasant Hill: Includes plan for community shelter (tornado mitigation) Raymore: Inflow and infiltration system improvements (drought mitigation) Cass County: identifies bridge projects and allocates funding for culvert and pipe replacement.
Emergency Operations Plan	Harrisonville: Updated every year (all hazards mitigation) Pleasant Hill: Looking to update their LEOP
Continuity of Operations Plan	Belton: Included in Emergency Operations Plan (all hazards mitigation)
Public Health Emergency Preparedness Plan	Most public health emergency preparedness and response plans are prepared and maintained by county and city public health departments Raymore: Revisions ongoing at County Health Department
Storm Water Management Plan	Lake Winnebago: Submitted under MS4 Management Plan (flood mitigation) Cass County: Soil and Sediment Ordinance integrated into this plan
Burn Ordinance	Cass County: Responsibility of fire districts
CAPABILITY	**CLAY COUNTY**
Comprehensive Plan	Kearney: Recommends floodplains for open space and park land
Emergency Operations Plan	Kearney: Draft emergency operations plan is headed by Kearney Fire (all hazards mitigation) Kearney also has the Emergency Operations Plan for public works supplies (2015) for the city's water plant. Pleasant Valley has adopted the county's LEOP
Continuity of Operations Plan	Kearney: Part of our local Emergency Operations Plan
Public Health Emergency Preparedness Plan	Most public health emergency preparedness and response plans are prepared and maintained by county and city public health departments (Clay County Public Health Center, Kansas City Health Department). Clay County Health Department plan undergoing update
Storm Water Management Plan	Excelsior Springs, Gladstone, Liberty and North Kansas City have contributed to a regional effort to produce new APWA Stormwater Management Design Standards in 2025.

Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)	
CAPABILITY	**JACKSON COUNTY**
Comprehensive Plan	Blue Springs plan update underway Kansas City: The city prepared a new comprehensive plan in 2022 Lee's Summit: Development and impact on infrastructure (all hazards mitigation) Raytown: Completing update of the plan in 2025
Capital Improvements Plan	Lee's Summit: Storm water management and transportation (flood management) Oak Grove: Annually reviewed with budget (all hazards mitigation) Sni Valley FPD: Updated as part of annual budget (all hazards mitigation)
Emergency Operations Plan	Oak Grove: Continuous updates to Annexes since adoption (all hazards mitigation) Sni Valley: Basic Plan 2007; Annexes in continual update process (all hazards mitigation) Greenwood is working on an update
Continuity of Operations Plan	Independence: Available in Community Development (all hazards mitigation) Kansas City, Mo: Utilize MARC's products (all hazards mitigation) Lee's Summit: FEMA floodplain maps (flood mitigation/management) Oak Grove: Ongoing GIS data project (identification of hazard areas)
Public Health Emergency Preparedness Plan	Most public health emergency preparedness plans are prepared and maintained by county and city public health agencies Lee's Summit: Jackson County Health Department (emerging infectious disease mitigation)
Storm Water Management Plan	Kansas City: addresses buyouts, retrofitting, flood risk infrastructure Lee's Summit: Management of storm water (supports flood mitigation) Kansas City, Independence and Lee's Summit have contributed to a regional effort to produce new APWA Stormwater Management design standards in 2025
CAPABILITY	**PLATTE COUNTY**
Comprehensive Plan	Platte County: Supports ongoing mitigation projects. Parkville: Supports ongoing mitigation projects through resource preservation; setbacks; access strategies Riverside: Address sustainability and natural resource management Weatherby Lake: Roads and sewers mitigation work to support flood mitigation efforts
Capital Improvements Plan	Platte County: Supports ongoing mitigation projects Parkville: Supports infrastructure; flood mitigation projects Platte City: Currently adopted this year, will support ongoing mitigation projects.
Emergency Operations Plan	Platte County: Ongoing yearly by Emergency Management (all hazards mitigation) Updating to ESF format in 2019/2020 Parkville: Follow county Plan (all hazards mitigation) Platte City: Adopted on County Plan (all hazards mitigation) Riverside: Updated to meet ESFs Weatherby Lake: Follow and participate through Platte Co EM (all hazards mitigation)
Continuity of Operations Plan	Platte County: Updated and practiced in planning by Emergency Management (all hazards mitigation) Parkville: Follow county plan

Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)	
	Platte City: Currently under development (all hazards mitigation) Weatherby Lake: County and city have this capability (all hazards mitigation)
Public Health Emergency Preparedness Plan	Platte County: Platte County Health Department (emerging infectious disease mitigation) develops and maintains public health emergency plans for the county; Kansas City Health Department prepares and maintains emergency plans for the portion of the city in Platte County Platte City, Weatherby Lake: Platte County Health Department (emerging infectious disease mitigation)
Storm Water Management Plan	Parkville: Supports flood Mitigation/Prevention Platte City: Supports Comprehensive Plan and ongoing mitigation projects Parkville and Riverside have contributed to a regional effort to produce new APWA Stormwater Management design standards in 2025
Brownfields Redevelopment	Platte City: Community Center
CAPABILITY	**RAY COUNTY**
Emergency Operations Plan	Ray County: Reviewed to address threats and hazards
Stormwater Management Plan	Ray County: Planning and Zoning regulations
Public Health Emergency Preparedness Plan	Ray County Health Department prepares and maintains public health emergency preparedness plans

3.3 Community Profile Survey Results

3.3.1 Planning and Regulatory Capabilities

The Community Profile survey collected information about the planning and regulatory capabilities of cities and counties including special districts. Jurisdictions were asked to identify all adopted building and fire codes and any measures complementary to local mitigation actions. Table 3.4 represents an overview of building-related codes. Most of the participating jurisdictions have adopted building, fire, plumbing and mechanical codes. The versions vary with many having adopted 2012 and 2018 as the most current versions. Over half of the jurisdictions have adopted Dangerous Building Codes, some using national codes and some adopting local ordinances.

Table 3.5 indicates if the code is adequately enforced and whether the code was related to or reviewed as part of the HMP update. Most jurisdictions indicated that they adequately enforce their building and related code. ManyPublic Health Agency Template - 2025.docx

of the smaller jurisdictions have greater challenges with implementation due to staffing limitations.

Table 3.6 describes how codes and other relevant measures were incorporated into the HMP by each jurisdiction. Table 3.8 describes how land use-related ordinances and policies are relevant to the HMP.

Building Codes (Community Profile, Part 2D, Question 2)

Ordinances and Policies (Community Profile, Part 2D, Question 3)

Table 3.4: Building Codes Adopted by Local Jurisdictions																		
Jurisdiction	**Building Code**	**Year**	**Class**	**Fire Code**	**Year**	**Class**	**Mechanical Code**	**Year**	**Class**	**Plumbing Code**	**Year**	**Class**	**Dangerous Buildings**	**Year**	**Class**	**Other Codes**	**Year**	**Class**
Cass County	IC	2006		IFC	2006		IMC	2006		IPC	2006			2019		NEC	2005	
Belton	IBC	2018	4	IFC	2018	2	IMC	2018		UPC	2018		UCADB	2018		NEC	2018	
Harrisonville	IBC	2012	3	IFC	2012	4	IMC	2012	3	IPC	2012	3	IBC	2012	3			
Lake Annette	IBC																	
Lake Winnebago	IRC	2018		IFC	2018		IMC	2018		IPC	2018		IBC	2018		NEC	2017	
Peculiar	IBC	2003		IFC	2006		IMC	2003		IPC	2003		IBC	2003		NEC	1999	
Pleasant Hill	IBC	2012	5	IFC	2012	4	IMC	2012	5	IPC	2012	5	Local					
Raymore	IBC	2012		IFC	2012		UMC	2012		UPC	2012			2006				
Clay County	IBC	2012	6	IFC	2012		IMC	2012	7	IPC	2012	7	Local	1996		NEC	2011	
Excelsior Springs	IBC	2012	5	IFC	2012	5	IMC	2012	5	IPC	2012	5		1992				
Gladstone	IBC	2020	2	IFC	2020	2	IMC	2020	2	IPC	2020	2	IBC	2020		NEC	2020	
Kearney	IBC	2018	9	IFC	2018	4	IMC	2018	9	IPC	2018	9	IPMC	2018		NEC	2017	9
Lawson	IBC	2006		IFC	2006		IMC	2006		IPC	2006		Local	1995		NEC	2005	
Liberty	IBC	2012		IFC	2012	2	IMC	2012		IPC	2012							
North Kansas City	IBC	2018	1	IFC	2018	1	IMC	2018	1	IPC	2018	1	IPMC	2018	1	NEC	2018	
Smithville	IBC	2018	4	IFC	2018		IBC	2018		IBC	2018		IPMC	2018		NEC	2017	
Pleasant Valley	IBC	2012		IFC	2012		IMC	2012		IPC	2012		UCADB	2012				
Jackson County	IBC	2018	5	IFC	2018	5	IMC	2018	5	IPC	2018	5						
Blue Springs	IBC	2018	4	IFC	2018	3	IMC	2018	4	IPC	2018	4	UBC	2018				
Grandview	IBC	2018		IFC	2018		IMC	2018		IPC	2018					NEC	2018	
Greenwood	IBC	2012	2	IFC	1997	2	IMC	2012		IPC	2012							
Independence	IBC	2012	4	IFC	2012	2	IMC	2012	4	IPC	2012	4		2012				
Kansas City, Mo.	IBC	2018	2	IFC	2018	1	IMC	2012	2	UPC	2012	2	IBC	2014	2			
Lee's Summit	IBC	2018	4	IFC	2018	3	IMC	2018	4	IPC	2018	4	Local					
Oak Grove	IBC	2018	2	IFC	2018	2	IMC	2018	2	IPC	2018	2				NEC	2008	
Raytown	IBC	2018	5	IFC	2018	5	IMC	2018	5	IPC	2018	5	IPMC	2018	5	NEC	2017	5
Grain Valley	IBC	2018		IFC	2018		IMC	2018		IPC	2018							
Sni Valley FPD	IBC	2003		IFC	2003		IMC	2003		IPC	2003			2003			2003	
Central Jax Co FPD	IBC	2018	4	IFC	2018	3	IMC	2018										

Table 3.4: Building Codes Adopted by Local Jurisdictions (Continued)																		
Jurisdiction	**Building Code**	**Year**	**Class**	**Fire Code**	**Year**	**Class**	**Mechanical Code**	**Year**	**Class**	**Plumbing Code**	**Year**	**Class**	**Dangerous Buildings**	**Year**	**Class**	**Other Codes**	**Year**	**Class**
Platte County	IBC	2018		IFC	2003	2	IMC	2018	5	IPC	2018	5		1993		NEC	2017	
Farley	IRC	2009																
Lake Waukomis	IBC	2012	4	IFC	2018	4	IRC	2009		IRC	2009		IBC	2003				
Northmoor	IBC	2012		IFC	2012		IMC	2012		IBC	2012		IBC	2012				
Parkville	IBC	2012	4	IFC	2012	4	IMC	2012	4	IPC	2012	4				NEC	2010	4
Platte City	IBC	2013	5	IBC	2013	5	IBC	2013	5	IBC	2013	5	IBC	2013	5			
Platte Woods	IBC	2007		IBC	2007		IBC	2007		IBC	2007		IBC	2007				
Riverside	IBC	2018	2	IFC	2018	2	IMC	2018	2	IPC	2018	2				NEC	2018	
Tracy	IBC	2006	4	IBC	2006	4	IBC	2006	4	IBC	2006	4	IBC	2006	4	NEC	2011	4
Weatherby Lake	IRC	2015	3	IFC	2015	4	IRC	2015	3	IRC	2015	3	IRC	2015	3			
Weston	IBC	2000		IBC	2000		IBC	2000		IBC	2000		IBC	2000				
Ray County	IBC	2015		IFC	2015		IMC	2015		IPC	2015					NEC	2014	
Richmond	IBC	2021	4	IFC	2021	3	IMC	2021	4	IPC	2021	4	IBC	2021	4	NEC	2020	4

IC – International Code
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IMC – International Mechanical Code
IPC – International Plumbing Code
IPMC – International Property Maintenance Code
IRC – International Residential Code
NEC – National Electric Code
NFC – National Fire Code
UCABD – Uniform Code for Abatement of Dangerous Buildings
UMC – Uniform Mechanical Code
UPC – Uniform Plumbing Code

Table 3.5: Codes Adequately Enforced																		
Jurisdiction	Building			Fire			Mechanical			Plumbing			Dangerous Buildings			Other Codes		
	TYPE	ADEQ	HMP	TYPE	ADEQ	HMP	TYPE	ADEQ	HMP	TYPE	ADEQ	HMP	TYPE	ADEQ	HMP	TYPE	ADEQ	HMP
Cass County	IC	X	X	IFC	X		IMC	X		IPC	X		Local	X		NEC	X	
Belton	IBC	X		IFC	X		IMC	X		IPC	X		IBC	X				
Harrisonville	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X	IBC	X	X			
Lake Annette	IBC	X																
Lake Winnebago	IRC	X		IFC	X		IMC	X		IPC	X					NEC	X	
Peculiar	IBC	X		IFC	X		IMC	X		IPC	X		IBC	X		NEC	X	
Pleasant Hill	IBC	X		IFC	X		IMC	X		IPC	X		Local	X				
Raymore	IBC	X	X	IFC	X	X	UMC	X	X	UPC	X	X		X	X			
Clay County	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X				IRC		
Excelsior Springs	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X		X	X			
Gladstone	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X				NEC		
Kearney	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X	IPMC			NEC	X	X
Lawson	IBC	X		IFC			IMC	X		IPC	X		Local			NEC	X	
Liberty	IBC	X		IFC	X		IMC	X		IPC	X							
North Kansas City	IBC	X		IFC	X		IMC	X		IPC	X					NEC	X	
Smithville	IBC	X					IBC	X		IBC	X		IPMC					
Pleasant Valley	IBC	X																
Jackson County	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X						
Blue Springs	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X	IBC	X	X	IBC	X	X
Grain Valley	IBC	X		IFC	X		IMC	X		IPC	X							
Grandview	IBC	X		IFC	X		IMC	X		IPC	X					NEC	X	
Greenwood	IBC	X		IFC			IMC			IPC								
Independence	IBC	X		IFC	X		.IMC	X		IPC	X		Local	X		Multi		
Kansas City, Mo.	IBC	X		IFC	X		IMC	X		UPC	X		IBC	X				
Lee's Summit	IBC	X		IFC	X		IMC	X		IPC	X		UCADB					
Oak Grove	IBC	X		IFC	X		IMC	X		IPC	X					NEC		
Raytown	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X	IPMC	X	X	NEC	X	X

Table 3.5: Codes Reviewed Adequately Enforced (Continued)																		
Jurisdiction	**Building**			**Fire**			**Mechanical**			**Plumbing**			**Dangerous Buildings**			**Other Codes**		
Platte County	IBC	X	X				IMC	X	X	IPC	X	X			X			
Farley	IRC	X																
Lake Waukomis	IBC	X		IFC			IRC			IRC			IBC					
Northmoor	IBC	X	X	IFC		X	IMC		X	IBC		X	IBC		X			
Parkville	IBC	X	X	IFC	X	X	IMC	X	X	IPC	X	X				NEC	X	X
Platte City	IBC	X	X	IBC	X	X	IBC	X	X	IBC	X	X	IBC	X	X			
Platte Woods	IBC	X	X	IBC	X	X	IBC	X	X	IBC	X	X	IBC	X	X			
Riverside	IC	X	X	IC	X	X	IC	X	X	IC	X	X	IC	X	X	IC	X	X
Tracy	IBC	X		IBC	X		IBC	X		IBC	X		IBC	X		NEC	X	
Weatherby Lake	IRC	X	X	IFC	X	X	IRC	X	X	IRC	X	X	IRC	X	X			
Weston	IBC	X		IBC	X		IBC	X		IBC	X		IBC					
Ray County	IBC	X		IFC	X		IBC/IRC	X		IPC/IRC	X		IPMC	X		NEC	X	
Richmond	IBC	X		IFC	X		IMC	X		IPC	X		IBC	X		NEC	X	

Key: ADEQ = Adequately Enforced HMP = Reviewed for HMP Update

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IMC – International Mechanical Code
IPC – International Plumbing Code
IPMC – International Property Maintenance Code
IRC – International Residential Code
NEC – National Electric Code
NFC – National Fire Code
UCABD – Uniform Code for Abatement of Dangerous Buildings
UMC – Uniform Mechanical Code
UPC – Uniform Plumbing Code

Table 3.6: Relevant Measures Incorporated into HMP (Building Codes)	
CAPABILITY	**CASS COUNTY**
Building Code	Pleasant Hill: Additional safe room standards established
Dangerous Building Code	Cass County: Local code regulations Lake Winnebago: Does not apply to current City R-1 Zoning Raymore: Local code regulations Pleasant Hill: Local code regulations
Other Codes	Lake Winnebago: NEC Peculiar: NEC
CAPABILITY	**CLAY COUNTY**
Building Code	Kearney: 2018 IRC and IBC Clay County: IBC and IRC 2012
Fire Code	Kearney: IFC Class 3 Clay County: IFC 2012
Dangerous Building Code	Excelsior Springs: City has local ordinance; Kearney IPMC 2018 & local ordinance
Other Codes	Excelsior Springs NEC 2011 Kearney NEC 2017 North Kansas City: NEC 2018 Clay County: NEC 2011
CAPABILITY	**JACKSON COUNTY**
Building Code	Grandview: Has updated to 2018 version Kansas City: Has updated incorporating stronger energy conservation provisions in 2024
Fire Code Mechanical Code Plumbing Code	Grandview: Updated to 2018 versions
Dangerous Building Code	Blue Springs: All IBC modules Independence: City has local ordinance Lee's Summit: City has local ordinance Oak Grove: Oak Grove Municipal Ordinance
Other Codes	Jackson County: NEC Grandview: Updated NEC to 2018 Independence: IFGC, IRC, NEC, IEBC Oak Grove: NEC; 2009 IFGC; Int'l Private Property
CAPABILITY	**PLATTE COUNTY**
Building Code	Platte County: Planning and Zoning
Fire Code	Lake Waukomis: Contract with Kansas City, MO Fire Department
Mechanical Code	Platte County: Planning and Zoning
Plumbing Code	Platte County: Planning and Zoning
Dangerous Building Code	Platte County: County-only code
Other Codes	Tracy: NEC
CAPABILITY	**RAY COUNTY**
Other Codes	Richmond: NEC 2018

IBC – International Building Code
IC – International Code
IEBC – International Existing Building Code
IFGC – International Fuel Gas Code
ISPSC – International Swimming Pool and Spa Code
NEC – National Electric Code

Table 3.7: Ordinances and Policies Adopted by Local Jurisdictions																										
ORDINANCES ADOPTED BY JURISDICTION	**Cass County**	Belton		Harrisonville	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Grain Valley	North Kansas City	Smithville	Pleasant Valley	**Jackson County**	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove	Raytown
Stream setback ordinances	✓	✓						✓	✓	✓	✓			✓	✓			✓	✓	✓	✓		✓	✓	✓	✓	
Floodplain management ordinances	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Soil and erosion ordinances	✓	✓		✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
Burn ordinances	✓	✓		✓		✓	✓			✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓
Storm water runoff ordinances	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Water conservation measures	✓	✓		✓				✓		✓				✓					✓	✓				✓		✓	✓
Open space acquisition/dedication		✓		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
Flood buyout		✓		✓		✓				✓				✓					✓				✓	✓	✓		
Site plan review requirements	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓

ORDINANCES ADOPTED BY JURISDICTION	Central Jackson County FPD	Sni Valley FPD	**Platte County**		Farley			Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD		**Ray County**	Richmond
Stream setback ordinances			✓							✓	✓		✓		✓				✓	✓
Floodplain management ordinances			✓		✓			✓	✓	✓	✓	✓	✓	✓		✓			✓	✓
Soil and erosion ordinances			✓					✓		✓	✓		✓	✓	✓				✓	✓
Burn ordinances	✓	✓						✓	✓		✓	✓	✓	✓	✓	✓				✓
Storm water runoff ordinances			✓						✓	✓	✓	✓	✓	✓	✓					✓
Water conservation measures			✓					✓			✓					✓				
Open space acquisition/dedication			✓							✓	✓									✓
Flood buyout			✓											✓						✓
Site plan review requirements			✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓			✓	✓

Table 3.8: Relevant Measures Incorporated into HMP (Ordinances/Policies)	
CAPABILITY	**CASS COUNTY**
Soil and Erosion Ordinance	Cass Co has incorporated provisions into Stormwater requirements
Burn Ordinance (i.e., farmland, prairie)	Cass Co. – Under local fire protection district authority Raymore: As needed through South Metro Fire Protection (wildland fire mitigation) Pleasant Hill has local burn ordinance
Flood Buyout	Raymore: No structures are within the flood hazard area (Supports continued NFIP participation)
CAPABILITY	**CLAY COUNTY**
Floodplain Management Ordinance	Kearney: Development required to meet floodplain ordinance (Supports continued NFIP participation)
Burn Ordinance (i.e., farmland, prairie)	Kearney: burn permits required; issued by fire district Smithville: adopted and enforced by Smithville Area FPD
Storm Water Runoff Ordinance	Kearney: Detention facilities required to minimize flooding (Supports continued NFIP participation)
Flood Buyout	Kearney: No residential structures within floodplain (Supports continued NFIP participation)
CAPABILITY	**JACKSON COUNTY**
Stream Setback Ordinance	Oak Grove: Uniform Development Code (UDC) (Supports continued NFIP participation)
Floodplain Management Ordinance	Lee's Summit: Chapter 6 of the Unified Development Ordinance (Supports continued NFIP participation)
Soil and Erosion Ordinance	Grandview: Land disturbance permit greater than 1 acre Kansas City: MS4 Program Levasy: Challenge to implement Oak Grove: Follow Federal Clean Water Act
Burn Ordinance (i.e., farmland, prairie)	Oak Grove: Permits by Sni-Valley FPD required each day; banned except for designated days. Sni-Valley permit based on fire danger and air quality.
Storm Water Runoff Ordinance	Grandview: Follows KCAPWA design standards Lee's Summit: Chapter 34 of the City Code of Ordinances (Supports continued NFIP participation) Oak Grove: UDC incorporates requirements on developers (Supports continued NFIP participation)
Water Conservation Measures	Grandview: Uses detention areas to hold runoff Lee's Summit: As needed during drought conditions Oak Grove: Emergency Powers under Emergency Management Ordinance

Table 3.8 Relevant Measures Incorporated into HMP (Ordinances/Policies) (Continued)	
Open Space Acquisition/Dedication	Lee's Summit: Being evaluated to acquire stream corridors (Supports continued NFIP participation) Oak Grove: Flood Plain and Uniform Development Code (Supports continued NFIP participation)
Flood Buyout	Lee's Summit: Limited scale (Supports continued NFIP participation) Oak Grove: No developed property eligible to buyout (Supports continued NFIP participation)
Site Plan Review Requirements	Kansas City: floodplain, airport zones, historic preservation Oak Grove: Site plans reviewed according to UDC standards Lee's Summit: Being used to acquire stream corridors
CAPABILITY	**PLATTE COUNTY**
Stream Setback Ordinance	Platte County: Planning and Zoning (Supports continued NFIP participation). New development is required to be setback. Lake Waukomis has adopted Ord. 468
Floodplain Management Ordinance	Platte County: Planning and Zoning and Emergency Management (Supports continued NFIP participation) Parkville: Adopting Update January 2015 (Supports continued NFIP participation) Platte City: Adopting February 2015 (Supports continued NFIP participation)
Soil and Erosion Ordinance	Platte County: Planning and Zoning applies to land under development Lake Waukomis: HOA / silt management Weatherby Lake: City ordinance enforced by Public works
Burn Ordinance (i.e., farmland, prairie)	Houston Lake: Open burning ordinance adopted into city code 2013 Lake Waukomis: Small campfire; grill Weatherby Lake: City ordinance enforced by Public Works
Storm Water Runoff Ordinance	Platte County: Planning and Zoning (Supports continued NFIP participation) applies to land under development Weatherby Lake: City ordinance monitored by MS4 Committee (Supports continued NFIP participation)
Water Conservation Measures	Platte County: Voluntary Green Build
Open Space Acquisition/Dedication	Platte County: Planning and Zoning (Supports continued NFIP participation) required for new development
Flood Buyout	Platte County: last used after 1993 flood
Site Plan Review Requirements	Platte County: Planning and Zoning part of development process Weatherby Lake: This is part of the planning code ordinance

3.3.2 Administrative and Technical Capabilities

The profile survey collected information about administrative functions, staffing, and technical resources to identify whether capabilities were available at the local level to assist with mitigation planning and implementation of mitigation actions. Smaller jurisdictions were asked to indicate any public resources available at the next higher level of government (i.e., technical assistance).

Administrative Resources *(Community Profile, Part 2A, Question 1)*

In Part 2A of the Community Profile Survey, jurisdictions were asked to identify administrative resources available to assist with mitigation activities. **Table 3.9** provides a list of administrative functions fulfilled at the local level by each jurisdiction.

The profiles provide responses on the following items: is assistance available at the next level of government; is coordination between governments effective for mitigation purposes; and were functions reviewed as part of the HMP update.

Staffing Resources *(Community Profile, Part 2A, Question 2)*

Jurisdictions were next asked to describe staffing resources available to assist with mitigation efforts. **Table 3.10** lists all relevant full- and part-time positions. Many communities have limited staff to carry out planning and building responsibilities, including floodplain management.

Technical Resources *(Community Profile, Part 2A, Question 3)*

Jurisdictions were asked to identify all technical resources available to assess and mitigate risk. **Table 3.11** lists the tools that were useful to meet local planning needs.

Table 3.12 describes relevant measures incorporated into the HMP as stated by the jurisdiction.

Refer to the following pages for the Administrative and Technical tables referenced above.

Table 3.9: Local Administrative Resources by Jurisdiction																									
ADMINISTRATIVE FUNCTION AT THE LOCAL LEVEL	**Cass County**	Belton	Harrisonville	Lake Annette	Lake	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior	Gladstone	Kearney	Lawson	Liberty	Pleasant Valley	North Kansas	Smithville	Levasy	**Jackson County**	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove
Planning & Zoning Commission	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Mitigation Planning Committee	✓				✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓					✓	✓	✓
Maintenance program	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓
Mutual aid agreement	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

Table 3.9 Local Administrative Resources by Jurisdiction (Continued)																		
ADMINISTRATIVE FUNCTION AT THE LOCAL LEVEL	Raytown	Grain Valley	Central Jackson County FPD	Sni Valley FPD	**Platte County**	Farley	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	**Ray County**	Richmond
Planning & Zoning Commission	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mitigation Planning Committee		✓			✓				✓		✓	✓				✓	✓	✓
Maintenance program	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓
Mutual aid agreement	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

Table 3.10: Local Staffing Resources by Jurisdiction																								
LOCAL STAFFING (FULL-TIME OR PART-TIME)	**Cass County**	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	North Kansas City	Smithville	Grain Valley	**Jackson County**	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove
Chief Building Official	FT	FT	FT	PT	PT	FT	FT	FT	FT	FT	FT		PT	FT	FT	FT	FT	FT	FT	FT	PT	FT	PT	FT	FT
Floodplain Administrator	FT	FT	PT	PT	PT	PT	PT	FT	FT	PT	FT	FT	PT	FT	FT	FT	FT	FT	FT	PT	PT	FT	PT	FT	PT
Emergency Manager	FT	FT	FT	PT	PT	FT	PT	FT	FT	PT	FT		PT	FT	FT	FT	FT	PT	PT	PT	PT	FT	FT	FT	FT
Community Planner	FT	FT	FT	PT	PT	FT	PT	FT	FT		FT	FT		FT	FT	FT	FT	FT	FT	FT		FT	PT	FT	
Civil Engineer	FT	FT	FT	PT	PT	FT		FT			FT	FT	PT	FT	PT		FT	FT	FT	FT		FT	FT	FT	PT
Public Health Official	FT	PT							FT		FT							FT				FT	FT	FT	PT
IT Support	FT	FT	FT	PT	PT	FT	PT	FT	FT		FT	PT	PT	FT	FT	PT	PT	FT	FT	FT	PT	FT	FT	FT	PT
GIS Coordinator	FT	FT				PT	PT	FT	FT	FT	FT	FT		FT	FT		FT	FT	FT	PT		FT	FT	FT	PT

LOCAL STAFFING (FULL-TIME OR PART-TIME)	Raytown	Central Jackson County FPD	Sni Valley FPD	Grain Valley	Levasy	**Platte County**	Farley	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD		**Ray County**	Richmond
Chief Building Official	FT	FT	PT	FT		FT	PT	PT	PT	PT	FT	PT	FT		FT	PT			PT	FT
Floodplain Administrator	PT	FT		FT	PT	FT	PT	PT	PT	FT	FT	FT	FT	PT		FT			PT	FT
Emergency Manager	PT	FT		FT		FT	PT	PT	PT	FT	FT	FT	FT		FT	FT			PT	FT
Community Planner	FT	FT		FT		FT		PT	PT	FT	FT	PT	FT		FT					FT
Civil Engineer	FT	FT		FT		FT		PT	PT	PT	PT	PT	FT		PT					
Public Health Official	PT	FT				FT				FT	FT	PT							FT	FT
IT Support	FT	FT	PT	PT		FT		PT	PT	PT	PT	PT	FT		PT	PT	PT		PT	PT
GIS Coordinator	PT	FT	PT	FT		FT		PT	PT	PT	PT		FT						PT	FT

FT = FULL TIME PT = PART TIME

Table 3.11: Local Technical Resources by Jurisdiction																								
TECHNICAL RESOURCE USEFUL TO LOCAL PLANNING	**Cass County**	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	North Kansas City	Smithville	Grain Valley	**Jackson County**	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee' s Summit
Warning system/services	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hazard data and information	✓	✓	✓		✓	✓	✓	✓			✓	✓		✓				✓		✓		✓	✓	✓
Critical Facility Map/APRS	✓	✓	✓		✓	✓	✓	✓			✓	✓					✓	✓	✓	✓		✓	✓	✓
HAZUS Analysis	✓		✓			✓												✓				✓	✓	
Existing Land Use Maps	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Future Land Use Maps	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓	✓	✓		✓
State Hazard Mitigation Plan	✓		✓	✓	✓	✓		✓			✓	✓		✓				✓				✓	✓	
Grant Writing	✓		✓			✓		✓	✓		✓					✓		✓	✓	✓		✓	✓	

TECHNICAL RESOURCE USEFUL TO LOCAL PLANNING	Oak Grove	Raytown	Central Jackson County FPD	Sni Valley FPD	Grain Valley	Levasy	**Platte County**	Farley	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	**Ray County**	Richmond
Warning system/services	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Hazard data and information	✓	✓	✓	✓			✓				✓	✓	✓	✓		✓		✓		✓
Critical Facility Map/APRS	✓	✓		✓	✓		✓					✓		✓		✓				
HAZUS Analysis							✓											✓	✓	
Existing Land Use Maps	✓	✓		✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Future Land Use Maps	✓			✓	✓		✓				✓	✓		✓		✓	✓		✓	✓
State Hazard Mitigation Plan	✓	✓		✓	✓					✓	✓	✓	✓			✓	✓	✓	✓	
Grant Writing	✓				✓					✓	✓	✓		✓		✓			✓	✓

Table 3.12: Relevant Measures Incorporated into HMP (Technical Resources)	
CAPABILITY	**CASS COUNTY**
Warning Systems	Cass Co: Everbridge mass notification system, social media Belton: outdoor warning siren, Everbridge text alert Pleasant Hill: multiple options include text alerts, opt in to Everbridge, and storm sirens Peculiar: Uses electronic texting to participating residents
Hazard Data	Belton: City of Belton EOP
Grant Writing	Cass County: interested in exploring HMPG and EMPG grant opportunities Raymore: Continue to explore multiple grant opportunities in addition to EMPG
Existing Land Use Map	Belton: WebGIS and website Raymore: Local GIS specialist continues to assess and analyze land use
Critical Facilities Map	Cass County: Needs more information to collect data Belton: WebGIS Lake Winnebago: Maps are available hard copy and laptop Pleasant Hill: critical facilities identified in emergency management SOP Raymore: Need to collect more information on critical facilities
CAPABILITY	**CLAY COUNTY**
Warning Systems	Gladstone: PM system BVPS, Everbridge Kearney: Used for tornadoes and severe weather. Social media; mass email to registered water customers Liberty: Warning sirens, mass texts to cell phones, email Pleasant Valley: tornado siren and public alert system North Kansas City: warning sirens Smithville: Citywide sirens in place Clay County: Outdoor Warning Sirens
Hazard Data	Gladstone: Critical facilities map, identify and pre-plan for critical infrastructure Clay County: LEOP
Existing Land Use Map	Kearney: Future Land Use Map identified future open space that correlates with floodplain areas (Supports continued participation in the NFIP) Liberty: Used to ensure no structures are built
Future Land Use Map	Liberty: Used to ensure no structures are built
CAPABILITY	**JACKSON COUNTY**
Warning Systems	Independence: SMS Texting System and outdoor siren system Kansas City: Multiple platforms Lee's Summit: Tornado sirens, Everbridge Oak Grove: Outdoor warning sirens, phone app/text/email, social media, indoor warning pager (also for Sni-Valley FPD) Raytown: Outdoor warning sirens, weather radios and communication equipment
Hazard Data	Kansas City, Mo: Information is contained within LEOP; MARC maintains data Oak Grove and Sni-Valley FPD: Lists and GIS maps in LEOP Raytown: Awareness of historical data helps provide hazard analysis
Grant Writing	Sni Valley FPD: have administrative personnel
HAZUS	Sni Valley FPD: Available but insufficient staff time to adequately utilize
Existing Land Use Map	Independence: Available in Community Development Kansas City, Mo: Utilize MARC's products Lee's Summit: FEMA floodplain maps Oak Grove and Sni-Valley FPD: Ongoing GIS data project Raytown: Maps updated

Table 3.12: Relevant Measures Incorporated into HMP (Technical Resources)	
Future Land Use Map	Independence: Available in Community Development Kansas City, Mo: Utilize MARC's products Lee's Summit: FEMA floodplain maps (Supports continued participation in the NFIP) Oak Grove: Ongoing GIS data project Sni Valley FPD: Available for Oak Grove only
State Hazard Mitigation Plan	Kansas City, Mo: Reviewed and incorporated into the LEOP Sni Valley FPD: Reviewed for LEOP
CAPABILITY	**PLATTE COUNTY**
Warning Systems	Platte County: looking at locations for additional sirens with new population growth Parkville: 4 sirens and weather radios in all city buildings Platte City: social media, audible sirens for severe weather Riverside: Use social media sites and Textcaster Weatherby Lake: updated storm sires, use Textcaster
Hazard Data	Platte County: Use of NWS, historical and Tier II data Lake Waukomis: Updating GIS data Northland RAD: Data is kept at county level and through dispatch software Riverside: NWS data
Grant Writing	Platte County: Staff in department help with grants Platte City: In-house person helps with grants Riverside: Grant writing resources available on an as-needed basis
HAZUS	Platte County: Floodplain manager keeps update (Supports continued participation in the NFIP)
Existing Land Use Map	Platte County: County planning team Platte City: Currently used by the city Parkville: in city plan Weatherby Lake: County and city have this capability
Future Land Use Map	Platte County: County planning team Parkville: included in city masterplan Riverside: Limited development in floodplain areas Platte City: Currently used by the city Weatherby Lake: County and city have this capability
SHMP	Platte County: SEMA plans are incorporated in county by reference Platte City: Working knowledge Weatherby Lake: Works along with current plan
Critical Facilities Map	Platte County: Updated in GIS Platte City: In-house use for the city Riverside: Evaluation of Critical infrastructure/facilities for entry into APRS Northland RAD: Data kept at county level and through dispatch software
CAPABILITY	**RAY COUNTY**
Warning Systems	Ray County: NIXLE mass communication systems Richmond: Monthly testing and maintenance contract
Hazard Data	Richmond: Floodplain and Storm water ordinances (Supports continued participation in the NFIP)
Grant Writing	Richmond: Utilize MARC
Existing Land Use Map	Richmond: Comprehensive Plan
Future Land Use Map	Richmond: Comprehensive Plan

3.3.3 Financial Capabilities

The profile survey collected information about financial capabilities to determine whether the jurisdiction has current or potential funding resources to assist with planning and implementation of mitigation actions. **Table 3.13** shows the type of mitigation actions funded in the last five years for the entire planning area.

Table 3.13: Types of Mitigation Activities Funded by Funding Source

Funding Resource	Structure and Infrastructure Projects	Local Plans and Regulations	Natural Systems Protection	Education and Awareness Programs	Total Mitigation Activities Funded
Capital Improvement Project Funding	15	4	1	0	20
Authority to levy taxes for specific purposes	13	1	0	0	14
Fees for water, sewer, gas or electric services	11	1	0	0	12
Impact fees for new development	4	2	0	0	6
Storm water utility fee	5	0	0	0	5
Incur debt through general and/or special tax bonds	3	0	0	0	3
Incur debt through private activities	0	0	0	0	0
Community Development Block Grant	3	2	0	2	7
Flood Mitigation Assistance Program	2	0	0	1	3
Pre-Disaster Mitigation Program	3	2	1	0	6
Hazard Mitigation Grant Program	1	1	0	0	2
Other	0	0	0	0	0
Type of Mitigation Activities Total)	**60**	**13**	**2**	**3**	**78**

Funding Resources *(Community Profile, Part 2B, Question 1)*

In Part 2B of the Community Profile Survey, jurisdictions were asked to describe the types of funding resources a jurisdiction has access to and is eligible to use funds for hazard mitigation.

Table 3.14 on the following page shows access or eligibility to use funding resources for hazard mitigation by jurisdiction.

Table 3.14 Jurisdiction Has Ability to Access These Funding Resources																								
Funding Resources	**Cass County**	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	North Kansas	Smithville	Pleasant Valley	**Jackson County**	Blue Springs	Grandview	Greenwood	**Independence**	**Kansas City, MO**	Lee's Summit
Capital Improvement Project Funding		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Authority to levy taxes for specific purposes	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Fees for water, sewer, gas or electric services	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Impact fees for new development		✓		✓	✓	✓	✓				✓	✓	✓	✓		✓		✓				✓	✓	✓
Storm water utility fee				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	
Incur debt through general and/or special tax bonds	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Incur debt through private activities								✓				✓			✓							✓		
Community Development Block Grant		✓	✓			✓			✓	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
Flood Mitigation Assistance Program		✓	✓	✓	✓	✓			✓			✓		✓		✓		✓		✓		✓	✓	✓
Pre-Disaster Mitigation Program				✓	✓	✓			✓		✓	✓		✓		✓		✓	✓	✓		✓		✓
Hazard Mitigation Grant Program			✓	✓	✓	✓			✓		✓	✓		✓	✓	✓		✓	✓			✓		✓

TABLE 3.14 JURISDICTION HAS ABILITY TO ACCESS THESE FUNDING RESOURCES	Oak Grove	Raytown	Levasy	Grain Valley	**Platte County**	Farley	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	**Ray County**	Richmond
Capital Improvement Project Funding	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Authority to levy taxes for specific purposes	✓	✓	✓	✓	✓		✓		✓	✓		✓		✓	✓		✓
Fees for water, sewer, gas or electric services	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓	✓		✓
Impact fees for new development	✓				✓				✓	✓				✓		✓	✓
Storm water utility fee					✓				✓								
Incur debt through general and/or special tax bonds	✓	✓	✓	✓	✓		✓		✓	✓		✓		✓	✓		✓
Incur debt through private activities															✓		
Community Development Block Grant	✓	✓	✓	✓	✓							✓		✓	✓		✓
Flood Mitigation Assistance Program	✓				✓				✓			✓		✓	✓	✓	
Pre-Disaster Mitigation Program	✓				✓		✓		✓		✓	✓		✓	✓	✓	
Hazard Mitigation Grant Program	✓	✓			✓		✓							✓	✓	✓	

3.3.4 Education and Outreach Capabilities

The profile survey collected information about access to existing education and outreach programs that could be used to implement mitigation activities.

Programs and Organizations *(Community Profile, Part 2C, Question 1)*

In Part 2C of the Community Profile Survey, jurisdictions were asked to state the usefulness of regional and local outreach programs and methods to implement mitigation activities and/or communicate hazard-related information.

Table 3.15 shows which methods were considered useful for implementation.

Table 3.16 describes relevant measures incorporated into the HMP as stated by the jurisdiction.

Table 3.15: Useful Outreach and Awareness Programs for Mitigation Activities by Jurisdiction																	
PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES	**Cass County**	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	**Clay County**	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	North Kansas City	Smithville	Pleasant Valley
Existing Warning Systems																	
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mass notification systems	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			
CMAS																	
MEMC Project Community Alert	✓				✓						✓			✓			
National Weather Service	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kansas City Scout	✓	✓	✓			✓								✓	✓	✓	✓
Community Partnerships																	
Regional Collaboration	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓		✓	✓		✓
SAVE Coalition	✓		✓		✓										✓		
Kansas City Organizations Active in Disaster	✓		✓		✓				✓								
Community Emergency Response Team		✓	✓	✓	✓			✓	✓		✓			✓	✓		
Medical Reserve Corps of Greater Kansas City	✓				✓			✓	✓		✓			✓			
Ongoing public education or information program	✓	✓	✓		✓	✓	✓	✓	✓		✓				✓		
Natural disaster or safety-related school program	✓	✓				✓	✓	✓					✓	✓			
StormReady certification	✓	✓				✓		✓	✓		✓			✓			
Public-private partnership initiatives (disaster-related)			✓		✓		✓	✓						✓			
Media coverage and public awareness	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓		✓

Table 3.15: Useful Outreach and Awareness Programs for Mitigation Activities by Jurisdiction (Continued)														
PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES	**Jackson County**	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove	Raytown	Central Jackson County FPS	Sni Valley FPD	**Platte County**	Farley	Lake Waukomis
Existing Warning Systems														
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mass notification systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
CMAS	✓						✓	✓		✓	✓			
MEMC Project Community Alert	✓				✓		✓	✓	✓	✓	✓	✓		
National Weather Service	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		
Kansas City Scout	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
Community Partnerships														
Regional Collaboration	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		
SAVE Coalition	✓	✓				✓		✓	✓	✓	✓	✓		
Kansas City Organizations Active in Disaster	✓				✓	✓		✓	✓	✓	✓	✓		
Community Emergency Response Team	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		
Medical Reserve Corps of Greater Kansas City	✓				✓			✓	✓			✓		
Ongoing public education or information program	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		
Natural disaster or safety-related school program	✓			✓			✓	✓	✓	✓	✓	✓		
StormReady certification	✓				✓	✓	✓					✓		
Public-private partnership initiatives (disaster-related)	✓			✓										
Media coverage and public awareness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

Table 3.15: Useful Outreach and Awareness Programs for Mitigation Activities by Jurisdiction (Continued)												
PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	Pleasant Valley	**Ray County**	Richmond
Existing Warning Systems												
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Mass notification systems	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
CMAS					✓		✓					
MEMC Project Community Alert		✓	✓		✓		✓					
National Weather Service	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Kansas City Scout	✓		✓		✓		✓					
Community Partnerships												
Regional Collaboration	✓	✓	✓		✓		✓			✓	✓	
SAVE Coalition	✓		✓		✓		✓	✓				
Kansas City Organizations Active in Disaster	✓	✓	✓				✓	✓			✓	
Community Emergency Response Team	✓	✓	✓				✓	✓				
Medical Reserve Corps of Greater Kansas City	✓	✓	✓		✓		✓					
Ongoing public education or information program	✓	✓	✓	✓	✓		✓	✓		✓	✓✓	✓
Natural disaster or safety-related school program			✓				✓	✓				✓
StormReady certification	✓	✓	✓		✓		✓	✓		✓		
Public-private partnership initiatives (disaster-related)	✓	✓			✓			✓				✓
Media coverage and public awareness	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓

Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources)	
Outreach Resource	**Cass County**
Storm Sirens	Cass Co: all sirens in county maintained by either a city or fire protection district Lake Annette: Working to install appropriate early warning system/siren Lake Winnebago: New warning system in place Peculiar: Emergency sirens are maintained by city and fire district Raymore: Uses Everbridge and social media
Mass Notification Systems	Cass Co: Everbridge; social media Harrisonville: CodeRed program Peculiar: Mass email and cell phone notification available Raymore: Internal CodeRed; Mass CodeRed; and Social Media
SAVE Coalition	Raymore: City could request SAVE if needed
National Weather Service	Pleasant Hill: city has personnel in NWS office during emergency events
Water Natural Resources Protection (NRI, WRP3)	Raymore: Part of city's illicit elimination and detection program
Storm Shelter Model Ordinance	Belton: Review with Planning Commission
Natural Disaster or Safety-Related School Program	Peculiar: School Resource Officer Raymore: Full-time community and school outreach officer
StormReady Certification	Harrisonville: Have applied in the past Peculiar: Chief of Police is certified
Public-Private Partnership Initiatives (disaster-related)	Raymore: Local churches and businesses are routine mitigation partners Pleasant Hill: Partnership for disaster shelter
Media Coverage and Public Awareness	Raymore: Local media, social media, and community outreach all used to raise public awareness
Outreach Resource	**Clay County**
Storm Sirens	Kearney: Used to communicate tornado warnings and other severe weather Liberty: utilized for outdoor notification for tornadic activity Clay Co: 7 outdoor storm sirens maintained by the county
Mass Notification Systems	Kearney: Kearney Police Department (KPD) participates in NIXEL and has an active Facebook page. City has the ability to send mass emails to registered water customers. Lawson: text messaging and social media Liberty: Send mass texts and emails Clay County: social media
CMAS	Kearney: KPD participates in NIXEL
National Weather Service	Clay County: Works closely with NWS during weather events Kearney: MERS is received on KPD radios
Kansas City Scout	Kearney: Scout cameras have been installed along I-35, but not message board.

Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources) (Continued)	
Outreach Resource	**Clay County**
Regional Homeland Security Coordinating Committee	Clay County Emergency Management is part of this committee.
KC Organizations Active in Disasters	Clay County: Kansas City VOAD, Kansas City COAD
Storm Ready Certification	Clay County: County Wide StormReady Certification
Community Emergency Response Team	Kearney: No such team in Kearney, though the KFRPD is considering
Ongoing Community Outreach	Clay County: Regular outreach events to engage and educate the public
Storm Shelter Model Ordinance	Kearney: Building Code includes provisions for constructing safe rooms
Natural Disaster or Safety-Related School Program	Kearney: KPD participates in the school districts fire/disaster/intruder safety drills Liberty: Teach fire safety in the schools
Media Coverage and Public Awareness	Kearney: Local channel 2 is made available by Fairport
Outreach Resource	**Jackson County**
Storm Sirens	Jackson County: County addition to Lake Jacomo and Blue Springs Lake Blue Springs: Weather warning Oak Grove: Emergency Management uses Outdoor Warning Sirens with voice public address for numerous other emergency messages and hazards other than weather Independence: Contract with Blue Valley Public Safety to maintain 31 sirens Grandview: some sirens not available Kansas City: goals and actions include adding sirens to increase coverage Sni Valley FPD: Outdoor warning siren in Bates City only; Oak Grove Voice System
Mass Notification Systems	Blue Springs: CodeRed reverse 911 Grandview: NIXLE Kansas City: Alert KC is utilized, goal and action to improve system Independence: EP uses Readytohelp.org for SMS-Currently do not have a comprehensive mass notification system that can be used for contact with the general public. Oak Grove: Emergency Management uses NIXLE.com for emergency messaging Raytown: Nixle is used to broadcast critical information to large audiences Sni Valley FPD: NIXLE.com use for mass notification
CMAS	Oak Grove: WEA will be used through Jackson County for emergency messaging in addition to NIXLE when all end user capability is in place. Sni Valley FPD: Available through Jackson County EMA Kansas City: iPAWS is utilized, action is to increase usage

Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources) (Continued)	
MEMC Project Community Alert	Independence: EP staff participated in Weather Radio programming event in May 2014 Oak Grove: This is not a warning system-public education/community partnership to educate about and sell NOAA radios Sni Valley FPD: This is not a warning system-public education/community partnership to educate about and sell NOAA radios Lee's Summit: recommend use of weather radios for indoor notification
National Weather Service	Jackson County: Annual County level weather training Blue Springs: Weather information sharing Independence: EP staff distributes NWS forecast daily to all city employees. EP uses NWS chat during weather events Oak Grove: NOAA Radio Sni Valley: NOAA Radio
Kansas City Scout	Jackson County: Emergency Services (EOC) Belton: Information sharing Independence: Utilized during EOC activations for increased situational awareness Oak Grove: Used to provide notice of incidents affecting highways; provides weather emergency information on message boards and text messages Sni Valley FPD: Same as Oak Grove
Regional Homeland Security Coordinating Committee	Jackson County: Active member Independence: Attended by EP Staff Oak Grove: Provides overall oversight of emergency programs Sni Valle FPD: Provides overall oversight of MARC emergency programs
SAVE Coalition	Oak Grove: SEMA sponsored damage assessment program using architects, engineers, and building officials Sni Valley: Same as Oak Grove
Kansas City Organizations Active in Disaster	Jackson County: KC VOAD Independence: Attended by EP Staff Oak Grove: Coordinates community and voluntary organizations Sni Valley FPD: Same as Oak Grove Grandview: works with American Red Cross
Community Emergency Response Team	Independence: EP has a team in place-Two classes scheduled each year, one in Spring, one in the fall. Oak Grove: Trains citizens to become basic level emergency responders Sni Valley: Same as Oak Grove

Medical Reserve Corps of Greater Kansas City	Independence: EP currently meeting with MRC to try and house program here Oak Grove: Provides organized group of medical personnel available for disasters Sni Valley: Same as Oak Grove
Ongoing Public Education or Information Program	Independence: EP distributes information at several events throughout the year Oak Grove: Oak Grove EMA Safety Information Program Sni Valley FPD: Same as Oak Grove Greenwood: Beginning work
Natural Disaster or Safety-Related School Program	Oak Grove: 4th Grade Safety Education at Oak Grove R-VI Schools by Sni Valley FPD Sni Valley: Same as Oak Grove Greenwood: Beginning work
StormReady Certification	Jackson County: County level StormReady Certification Independence: EP Staff renewed in November 2014 Oak Grove: Not applicable for Oak Grove-Sni Valley due to program requirements Greenwood: Reviewing information
Media Coverage and Public Awareness	Independence: City recently hired PIO; Public awareness campaign is under development Sni Valley: EMA uses combination for pamphlets, Local Access TV, Websites, print media, and public events
Outreach Resource	**Platte County**
Storm Sirens	Platte County: Monthly tests and statewide testing Platte City: New siren by city hall and recently upgraded and integrated Emmy Lane siren to the county activation Parkville: 4 sirens overlap with the county's system Platte Woods: Siren system activated by KCMO Tracy: Platte County sirens heard throughout city Weatherby Lake: Storm sirens tested every month on the first Wednesday
Mass Notification Systems	Platte County: Numerous forms (Textcaster, Nixle, Nextdoor, facebok, twitter) Lake Waukomis: Nixle, facebook Parkville: TextCaster Platte City: NIXLE Platte Woods: NIXLE Weatherby Lake: TextCaster; NIXLE
CMAS	Weatherby Lake: Available within the city limits and surrounding areas
MEMC Project Community Alert	Platte County: promote every year during storm seasons Platte City: Annual severe weather week at local Price Chopper Weatherby Lake: Done yearly at the local Price Chopper and local events Lake Waukomis, Platte Woods: work with the county

National Weather Service	Platte County: work with local NWS in Pleasant Hill Dearborn: County works with this organization Houston Lake: Member of NWS Weather Ambassador Lake Waukomis: Television; Internet Parkville: use Event service and work closely with their team Tracy: Get Alert Emails through City Hall Internet Weatherby Lake: Have this group in MEMC meetings and online with NWS Chat
Outreach Resource	**Platte County**
Kansas City Scout	Platte County: Platte County uses message boards and cameras to view traffic Dearborn: County works with this service Parkville: monitor for highway traffic incidents Platte City: In the last five year this has incorporated I29 in Platte City Weatherby Lake: In use on the major highways (I29, I635)
Regional Homeland Security Coordinating Committee	Platte County: Emergency Management is part of this organization Dearborn: Through the county Parkville: Through the county Weatherby Lake: Attend meetings on regular basis Platte City: Through the county
SAVE Coalition	Platte County: Emergency Management specialist are members Dearborn: Through the county Platte City: Through the State of Missouri Weatherby Lake: Several CERT members are part of this group
Kansas City Organizations Active in Disaster	Platte County: Emergency Management is a member Dearborn: Through the county Platte City: Through the county Weatherby Lake: Attend meetings on a regular basis
Community Emergency Response Team	Platte County: Platte County has been involved in CERT since 2003 Lake Waukomis: Pay through the county Platte City: Through the county and city classes Weatherby Lake: Several residents have taken the class
Medical Reserve Corps of Greater Kansas City	Platte County: Platte County recognizes this group Platte City: MARC Weatherby Lake: Aware of the group

Ongoing Public Education or Information Program	Platte County: Continued education throughout the year Platte City: Monthly Newsletter; NIXLE Weatherby Lake: With special events
Natural Disaster or Safety-Related School Program	Platte County: Emergency Management reviews fire drills, tornado drills Platte City: Platte County RIII Weatherby Lake: Park Hill School District
StormReady Certification	Platte County: 2019-2022 Parkville: Through the county Weatherby Lake: Through the county Platte City: Through the county
Media Coverage and Public Awareness	Platte County: PIO on a regional effort Platte City: City Administrator and use Platte County PIO Weatherby Lake: Local media works well with the community
Outreach Resource	**Ray County**
Mass Notification Systems	Ray County: Included as local warning capability
National Weather Service	Ray County: Work with routinely for storm information

3.3.5 Safe Growth Audit

Data Limitation: The Safe Growth Audit Tables are presented for Cass, Clay, Jackson, Platte and Ray Counties and their respective jurisdictions. Responses are based on data received from the community profile survey.

See Excel File labeled

Tables 3.17 through 3.21: Safe Growth Audit in Appendices

3.17 Cass County
3.18 Clay County
3.19 Jackson County (including KCMO)
3.20 Platte County
3.21 Ray County

3.3.6 Floodplain Management and NFIP Participation

All of the city and county jurisdictions participating in the 2025 Plan are also participants in the National Flood Program. See **Table 3.22** for a list of participants. According to the information on the SEMA website, there are 12 small communities in the Planning Area that have not entered the NFIP or have not remained current with the FEMA requirements – Camden Point, Camden, Elmira, Fleming, Loch Lloyd, Lone Jack, Ridgely, Sibley, Unity Village, Weatherby Lake, West Line and Wood Heights.

Table 3.22: National Flood Program (NFIP) Participation

Participant	NFIP Participant	Good Standing	Compliance Issues	CAV (last 5 years)	Reason if not an NFIP Participant
Cass County	X	X			
Belton	X	X			
Harrisonville	X	X		X	
Lake Annette	X	X			
Lake Winnebago	X	X		X	
Peculiar	X	X			
Pleasant Hill	X	X			
Raymore	X	X			
Clay County	X	X			
Excelsior Springs	X	X			
Gladstone	X	X			
Kearney	X	X		X	
Lawson	X	X			
Liberty	X	X			
North Kansas City	X	X		X	
Smithville	X	X			
Jackson County	X	X		X	
Blue Springs	X	X		X	
Grandview	X	X		X	
Greenwood	X	X			
Independence	X	X		X	
Kansas City, Mo.	X	X		X	
Lee's Summit	X	X		X	
Oak Grove	X	X		X	
Raytown	X	X			
Platte County	X	X		X	
Farley	X	X			
Lake Waukomis		X			
Northmoor	X	X			
Parkville	X	X			
Platte City	X	X			
Platte Woods	X	X			
Riverside	X	X		X	

Table 3.22: National Flood Program (NFIP) Participation (Continued)					
Participant	**NFIP Participant**	**Good Standing**	**Compliance Issues**	**CAV (last 5 years)**	**Reason if not an NFIP Participant**
Tracy	X	X			
Weatherby Lake			X		
Weston	X	X		X	
Ray County	X	X		X	
Richmond	X	X			

CAV = Community Assistance Visit

Sources: FEMA Community Status Book/Community Profile Survey

Table 3.23: NFIP Floodplain Administrator and Current FIRM			
Participant	**NFIP Entry Date**	**Floodplain Administrator**	**Most Current FIRM**
Cass County	2006	Valerie M. McCubbin, Director Building Codes, Environmental Health, Planning and Zoning https://ecode360.com/29288821	1/2/2013
Belton	2006	Ryan Haupt Public Works Permit Center – City of Belton	1/2/2013
Harrisonville	3/15/74	Ted Martin City of Harrisonville, MO Floodplain Management Regulations	1/2/2013
Lake Annette	3/16/06	Angela Hansen, Mayor	1/2/2013
Lake Winnebago	2/25/77	Steve Beserman	1/2/2013
Peculiar	1992	Bartlet & West	1/2/2013
Pleasant Hill	9/15/72	Missy Gentry Chapter 18 - ENVIRONMENT | Code of Ordinances | Pleasant Hill, MO | Municode Library	1/2/2013
Raymore	12/27/74	Lori Crandell City of Raymore, MO Flood Protection	1/2/2013
Clay County	1974	Kipp Jones Section 151-11.6 (C) of the Land Development Code (PDF)	8/3/2015
Excelsior Springs	4/5/74	Melinda Mehaffy City of Excelsior Springs, MO Floodway and Floodway Fringe Overlay District	8/3/2015
Gladstone	5/17/74	Timothy Nebergall	8/3/2015
Kearney	1978	David Pavlich	8/3/2015
Lawson		Stan Dobbins, City Administrator	8/3/2015

		City of Lawson, MO Floodplain Management	
Liberty	10/18/74	John Findlay ARTICLE XVI. - SITE DEVELOPMENT AND DESIGN STANDARDS | Code of Ordinances | Liberty, MO | Municode Library	8/3/2015
North Kansas City	1976	Anthony Sands Chapter 15.48 - FLOODPLAIN MANAGEMENT | Code of Ordinances | North Kansas City, MO | Municode Library	8/3/2015
Pleasant Valley		Chris Cronk, PW Director	8/3/2015
Smithville	1972	Mayra Toothman	8/3/2015
Jackson County	1979	Randy Diehl	1/20/2017 & 12/7/2023
Blue Springs	1978	Jake Farrell City of Blue Springs, MO Supplemental Standards	1/20/2017 & 12/7/2023
Grain Valley		Mark Trosen	1/20/2017 & 12/7/2023
Grandview	7/19/74	Doug Wesselschmidt Chapter 16 - ENVIRONMENT | Code of Ordinances | Grandview, MO | Municode Library	1/20/2017 & 12/7/2023
Greenwood	6/4/1976	Mitch Armer	1/20/2017 & 12/7/2023
Independence	1978	Brad Phelps Ordinance No. 19502 | Code of Ordinances | Independence, MO | Municode Library Article 7	1/20/2017 & 12/7/2023
Kansas City, Mo.	1978	Bob Lawler Chapter 28 - FLOODPLAIN MANAGEMENT | Code of Ordinances | Kansas City, MO | Municode Library	1/20/2017 & 12/7/2023
Lee's Summit	6/21/74	George Binger III Ordinance No. 10040 | Unified Development Ordinance | Lee's Summit, MO | Municode Library	1/20/2017 & 12/7/2023
Oak Grove	2004	Corey Alford Oak Grove, MO Zoning Ordinance | Zoneomics	1/20/2017 & 12/7/2023
Raytown	12/21/73	Jason Hansen Sec. 50-285. - Statutory authorization, findings of fact, and purposes. | Code of Ordinances | Raytown, MO | Municode Library	1/20/2017 & 12/7/2023
Platte County	1982	Daniel Erickson ZONING OVERLAY DISTRICT	1/20/2017 & 12/7/2023
Farley	2010	Mark Manville	1/20/2017 & 12/7/2023
Lake Waukomis	1976	Rick Zelfer	1/20/2017 & 12/7/2023

Northmoor	1974	Joe Harris	1/20/2017 & 12/7/2023
Parkville	1973	Stephen Lachky City of Parkville, MO Supplemental Standards	1/20/2017 & 12/7/2023
Platte City	1990	Summer Lutz	1/20/2017 & 12/7/2023
Platte Woods	1973	Jim Kerns	1/20/2017 & 12/7/2023
Riverside	9/30/1977	Mike Duffy City of Riverside, MO Floodplain Management Regulations	1/20/2017 & 12/7/2023
Tracy	11/22/74	Mark Manville	1/20/2017 & 12/7/2023
Weatherby Lake			1/20/2017 & 12/7/2023
Weston	1979	Kent Stelljes	1/20/2017 & 12/7/2023
Ray County	01-19-83	Stacy Wolfe	6/9/2012
Richmond	10/22/76	Lisa Hastings	6/9/2012

Question: What has been done to implement and enforce local floodplain regulations?

Each jurisdiction has adopted a floodplain management ordinance, has designated a full or part-time floodplain administrator, has an application or questionnaire for development applications that require information about addressing floodplain management if the property is within in whole or part a 100-year floodplain, and maintains the current FIRM maps for public review.

Question: How are substantial improvements/substantial damage provisions implemented after a flood event?

Each jurisdiction has provisions in their floodplain management ordinance to address this issue.

NFIP Insurance Status: Table 3.24 provides a summary of policies in force for jurisdictions in the five-county planning area. This information was obtained from the FEMA NFIP online database.

Table 3.24: NFIP Policy Statistics as of December 2024 by Jurisdiction			
Community	**Policies In-force**	**Insurance In-force**	**Total Written Premium + Federal Policy Fee**
CASS COUNTY	31	8,772,000	38,223
CLAY COUNTY	18	5,058,000	18,099
JACKSON COUNTY	28	7,764,000	28,640
PLATTE COUNTY	60	1,517,900	52,147
RAY COUNTY	44	7,787,000	53,605
LEE'S SUMMIT, CITY OF	4	1,600,000	61,891
ARCHIE, CITY OF	1	88,000	980
BELTON, CITY OF	5	106,700	2,623
HARRISONVILLE, CITY OF	21	5,669,000	20,681
LAKE ANNETTE, CITY OF	2	260,000	2,130
LAKE WINNEBAGO, CITY OF	6	2,125,000	5,300
PECULIAR, CITY OF	10	1,999,000	11,913
PLEASANT HILL, CITY OF	23	2,491,000	21,786
RAYMORE, CITY OF	17	4,230,000	11,097
EXCELSIOR SPRINGS, CITY OF	8	2,245,000	19,103
GLADSTONE, CITY OF	23	4,723,000	20,898
INDEPENDENCE, CITY OF	111	24,810,000	112,705
KANSAS CITY, CITY OF	419	172,700,000	735,504
KEARNEY, CITY OF	14	4,185,000	18,148
LAWSON, CITY OF	1	109,000	1,702
LIBERTY, CITY OF	35	3,313,000	35,274
PLEASANT VALLEY, CITY OF	5	1,071,000	2,655
MOSBY, CITY OF	6	676,000	5,192
NORTH KANSAS CITY, CITY OF	68	19,688,000	75,714
SMITHVILLE, CITY OF	58	10,515,000	69,187
BLUE SPRINGS, CITY OF	18	5,513,000	17,021
GRAIN VALLEY, CITY OF	14	3,640,000	15,660
GRANDVIEW, CITY OF	16	5,343,000	15,660
GREENWOOD, CITY OF	2	1,000,000	3,894
OAK GROVE, CITY OF	1	350,000	569
RAYTOWN, CITY OF	10	2,017,000	5,173
LEVASY, CITY OF	6	1,155,000	6,523
EDGERTON, CITY OF	2	106,000	1,784
FARLEY, VILLAGE OF	5	1,601,000	6,528
FERRELVIEW, VILLAGE OF	4	2,088,000	2,737
NORTHMOOR, CITY OF	1	500,000	4,464
PARKVILLE, CITY OF	20	6,771,000	14,644
PLATTE CITY, CITY OF	1	304,000	408
RIVERSIDE, CITY OF	24	11,020,000	35,799
WESTON, CITY OF	1	350,000	661
RICHMOND, CITY OF	1	105,000	739

Table 3.25 provides a summary of loss statistics in the five-county planning area. This information was obtained from the FEMA NFIP online database. Data from 2024 Database showing 1998-2023 losses.

Table 3.25 NFIP Loss Statistics as of 9/30/2023 by Jurisdiction					
Community	Total Losses	Single Family	2+ housing	Non-Resid	Total Payments
CASS COUNTY	27	27	0	0	810,437.75
CLAY COUNTY	3	3	0	0	39,642.56
JACKSON COUNTY	11	9	0	2	356,925.09
PLATTE COUNTY	35	33	0	2	1,159,393.08
RAY COUNTY	4	4	0	0	81,222.03
LEE'S SUMMIT, CITY OF	18	6	12	0	374,288.69
BELTON, CITY OF	3	2	0	1	25,212,42
HARRISONVILLE, CITY OF	19	13	3	3	1,001,986
LAKE ANNETTE, CITY OF	10	10	0	0	415,997.86
EAST LYNNE, CITY OF	11	0	0	11	197,562.95
FREEMAN, CITY OF	3	3	0	0	35,950.45
PECULIAR, CITY OF	16	0	0	0	440,669.04
PLEASANT HILL, CITY OF	3	2	0	1	0
RAYMORE, CITY OF	3	3	0	0	5,769.08
AVONDALE, CITY OF	5	5	0	0	44,987.51
CLAYCOMO, CITY OF	28	1	23	4	755,750.44
EXCELSIOR SPRINGS, CITY OF	15	5	0	11	1,356,183.13
GLADSTONE, CITY OF	6	6	0	0	90,266.78
INDEPENDENCE, CITY OF	21	20	0	1	235,310.72
KANSAS CITY, CITY OF	178	99	20	85	10,542,622,50
KEARNEY, CITY OF	1	1	0	0	0
LIBERTY, CITY OF	5	3	0	2	96,393.24
MOSBY, CITY OF	17	17	0	0	193,696.76
NORTH KANSAS CITY, CITY OF	0	0	0	0	0
SMITHVILLE, CITY OF	2	2	2	0	0
BLUE SPRINGS, CITY OF	5	4	1	0	50,441.71
BUCKNER, CITY OF	3	3	0	0	50,866.05
GRAIN VALLEY, CITY OF	1	1	0	0	0
GRANDVIEW, CITY OF	9	6	0	3	428,297.56
GREENWOOD, CITY OF	1	1	0	0	0
LEVASY, CITY OF	13	13	0	0	649,576.51
OAK GROVE, CITY OF	0	0	0	0	0
RAYTOWN, CITY OF	3	2	1	0	15,688.06
SUGAR CREEK, CITY OF	7	0	0	7	104,268.39
LAKE WAUKOMIS, CITY OF	0	0	0	0	0
NORTHMOOR, CITY OF	0	0	0	0	0
PARKVILLE, CITY OF	18	12	0	6	83,003.72
PLATTE CITY, CITY OF	0	0	0	0	0
RIVERSIDE, CITY OF	1	0	0	1	54,413.14
HARDIN, CITY OF	2	2	0	0	6,000
ORRICK, CITY OF	6	6	0	0	45,526.61
TOTAL	2991	2439	2	550	54,943,965.79

Source: Online FEMA LIMITED ACCESS

Repetitive Loss Properties

The Missouri State Hazard Mitigation Plan summarizes repetitive loss properties (RPL) by county. Due to Privacy Act requirements, supplemental information on repetitive loss properties was not provided by SEMA. Therefore, a map depicting mitigated and unmitigated properties was not possible. Table 3.26 depicts the information provided by SEMA for the 2015 plan. Updated information is currently not available from FEMA.

Table 3.26: Number of Repetitive Loss Properties by County and Type

County	Number of Repetitive Loss Properties	Number of Losses	Residential	Commercial	Total Building Loss
Cass County	37	122	32	5	$1,475,049.32
Clay County	181	611	338	243	$8,542,687.58
Jackson County	25	71	25	2	$425,914.22
Platte County	16	43	13	3	$723,992.19
Ray County	6	17	5	1	$173,968.50

Source: http://bsa.nfipstat.fema.gov/reports/1040.htm and SEMA

According to the Missouri State Hazard Mitigation Plan, Missouri has 159 Severe Repetitive Loss (SRL) Properties in the state, of which 25 have been mitigated. However, none of those properties were located in the Kansas City planning area. Thirteen of the state's remaining 134 unmitigated properties are located in Cass, Clay, Jackson and Ray Counties. Platte County has no SRL Properties. See Table 3.27: Number of Unmitigated Severe Repetitive Loss Properties.

Table 3.27: Number of Unmitigated Severe Repetitive Loss Properties

Cass County	Clay County	Jackson County	Platte County	Ray County
3	**8**	**1**	**0**	**1**

Floodplain Management Regulations

Table 3.28 briefly summarizes the status of a jurisdiction's regulatory components to maintain compliance with the NFIP requirements.

All but one jurisdiction, Weatherby Lake, participates in the program. All of those in the NFIP comply with federal insurance requirements to limit redevelopment or new development in the 100-year floodplain.

The latest FIRM maps have been provided to all of the participating jurisdictions. The dates on file with SEMA include (the county maps include all cities):

Cass County	January 2, 2013
Clay County	August 3, 2015
Jackson County	January 20, 2017, and December 7, 2023
Platte County	January 20, 2017, and December 7, 2023
Ray County	June 19, 2012

Source: Wornson, Jacob Jacob.Wornson@sema.dps.mo.gov email dated 3/14/25

Table 3.28: NFIP Regulatory Overview by Jurisdiction					
Jurisdiction	**Floodplain Ordinance Adopted**	**NFIP Entry Date**	**FIRMS Format**	**Floodplain Regulations**	**Permitting Process**
Cass County	X	2006	Paper	Exceeds	Apply for permit. Any work that is proposed to be done within the special Flood Hazard areas and requires engineering documenting prior and post work for the floodplain Development permit. County does pre site inspection. After construction another inspection is done to ensure compliance.
Belton	X	2006	Digital	Meets	Floodplain development permit must be submitted to the City Engineer and reviewed.
Harrisonville	X	3/15/74	Digital	Meets	Apply, review, accept or reject
Lake Annette	X	3/16/06	Paper	Meets	Review 100-year flood plain may prior to issuing building permit
Lake Winnebago	X	2/25/77	Paper	Meets	Floodplain management/development Regulation Forms are part of the Building Permit packet information that must be completed for all construction permits.
Peculiar	X	1992	Digital	Meets	An applicant/developer submits our Floodplain Development Permit Application and application fee. The City Engineer then reviews the proposed improvement as to whether or not the property is within the jurisdiction of the City and numbered zone on the FIRM Map.
Pleasant Hill	X	9/15/72	Digital	Meets	Construction in the floodplain requires permit. Elevation where necessary. Listed as a floodplain ordinance and also as a floodway zoning district overlay.
Raymore	X	12/27/74	Digital	Meets	Floodplain impacts are identified during the development application process. Developers must submit appropriate floodplain impact studies to FEMA for approval before they may proceed with the development.
Clay County	X	1974	Paper	Meets	Review/notify adjacent communities and SEMA prior to FEMA. Assure that maintenance is provided within the altered or relocated portion. Verify and record of the actual elevation of substantially 8mproved structures. When floodproofing is utilized for a non-residential structure, the Director of P&Z shall review. Review all subdivision proposals for flooding. Issue flood development permits.
Excelsior Springs	X	4/5/74		Meets	Development permit must be submitted to the Comm Dev Dept for review
Gladstone	X	5/17/74	Digital	Meets	Development in the floodplain requires submittal of a floodplain development permit, which is forwarded for review by City's Floodplain Administrator. Construction and building plans must meet the city's floodplain ordinance, including certification of compliance from an engineer registered in the State of Missouri.

Table 3.28: NFIP Regulatory Overview by Jurisdiction (Continued)					
Jurisdiction	**Floodplain Ordinance Adopted**	**NFIP Entry Date**	**FIRMS Format**	**Floodplain Regulations**	**Permitting Process**
Kearney	X	1979	Paper	Exceeds	Development in the floodplain requires submittal of a floodplain development permit, which is forwarded for review by the city's Floodplain Administrator. Construction and building plans must meet the city's floodplain ordinance, including certification of compliance from an engineer registered in the State of Missouri.
Lawson	X		Paper	Meets	Use outside resources if have any type of issue. No one on staff is trained.
Liberty	X	1978	Digital	Meets	Must follow UDO Unified Development Ordinance
Mosby	X	10/18/74	Paper	Meets	Review 100-year flood plain may prior to issuing building permit obtained through the ordinance requirements.
North Kansas City	X	1976	Paper	Meets	Permit obtained through the ordinance requirements.
Smithville	X	1972	Paper	Meets	Parcels in a flood zone must have engineered and surveyed drainage and submitted for review.
Jackson County	X	1979	Digital	Meets	During the building permit process the site is reviewed against current NFIP data. Once the review and corrections or adjustments are made then the building permit is either approved and issued or held for corrections.
Blue Springs	X	1978	Digital	Exceeds	Included in building permit process. State floodplain development permit
Grandview	X	7/19/74	Paper	Exceeds	Public works, engineer reviews plans for conformance with city code, forwards comments, public works issues permit after coordination with CD department to ensure no conflicts with other parts of building permit process.
Greenwood	X	6/4/1976	Paper	Meets	Included in building permit process, review plans with NFIP flood plain maps
Independence	X	1978	Digital	Exceeds	When a building permit comes in, the site plan is checked for location and utilities. If it is close to a floodplain it is checked to see if it is located in the SFHA. If it is, applicant is notified they need a Floodplain Development permit and an EC before they get a final inspection approval which is required for a CO.
Kansas City, Mo.	X	1978	Digital	Exceeds	Properties checked at time of project submittal for floodplain location, Floodplain Development Permit/Elevation Certificate required for properties in the 100-year floodplain. Floodplain applications reviewed either independent of the construction document building code review or concurrent, at the discretion of the applicant. Floodplain Development Permit issuance required prior to issuance of construction permits.

Table 3.28: NFIP Regulatory Overview by Jurisdiction (Continued)					
Jurisdiction	**Floodplain Ordinance Adopted**	**NFIP Entry Date**	**FIRMS Format**	**Floodplain Regulations**	**Permitting Process**
Lee's Summit	X	6/21/74	Paper	Meets	A floodplain development permit from the City is required for all work within a floodplain as defined on the Flood Insurance Rate Maps (FIRM) issued by FEMA. If work which places fill within the designated floodplain is hydraulically modeled by a registered Professional Engineer, a City of Lee's Summit "No Rise Certification" may be obtained if and only if the work had no impact to the Base Flood Elevation, in addition to the FEMA-requirements for work or placement of fill within a floodplain.
Oak Grove	X	2004	Paper	Meets	Permit application with plot plan showing location. Permit issued depending on compliance with regulations.
Raytown	X	12/21/73	Paper and Digital	Meets	Permit obtained through the ordinance requirements
Platte County	X	1982	Paper	Exceeds	FIRMs will be adopted by April 2015 and digital available afterwards.
Farley	X.	2010	Digital	Meets	
Lake Waukomis	X	1976	Paper	Meets	
Northmoor	X	1974	Paper	Meets	
Parkville	X	1973	Digital	Meets	Floodplain applications, no-rise certification.
Platte City	X	1990	Paper	Meets	
Platte Woods	X	1973	Paper	Meets	Not an NFIP member; not in a floodplain
Riverside	X	9/30/1977	Digital	Meets	Each project within the floodplain is also required to obtain a floodplain permit recommended by the Planning and Zoning Commission and approved by the Board of Aldermen. The City requires projects in the floodplain to provide an elevation certificate indicating that the lowest finished floor is located at least 1 foot above base flood elevation or that the structure is flood-proofed in accordance with the City's adopted floodplain ordinance which is based on the FEMA model ordinance.
Tracy	X	11/22/74	Paper	Meets	
Weatherby Lake					

Table 3.28: NFIP Regulatory Overview by Jurisdiction (Continued)					
Weston	X	1979	Paper	Meets	No development shall be permitted except through the issuance of a floodplain development permit, granted by the Board of Aldermen or its duly designated representative under such safeguards and restrictions as the Board of Aldermen or the designated representative may reasonably impose for the promotion and maintenance of the general welfare, health of the inhabitants of the community. All floodplain development permits will follow the Weston Code Chapter 415 on Floodplain Management.
Ray County	X	01-19-83	Paper	Meets	
Richmond	X	10/22/76	Digital	Exceeds	Plan review committee reviews all plans. Engineering and storm water studies are required to be submitted.

Floodplain Management Staffing

Most NFIP participants staff, with just under half having full-time staff to NFIP administration.

Table 3.29: Status of Staffing Resources for Effective NFIP Administration

Jurisdiction	Dedicated Staff	Auxiliary Function	Permit Review	GIS	Education Outreach	Inspections	Enforcement	Engineering
Cass County	Part time		E	E	E	E	E	E
Belton	Full time	X	E	E	E	E	E	E
Harrisonville	Part time		E	NI	NI	E	E	E
Lake Annette	Part time	X	NI	E	NI	E	E	
Lake Winnebago	Part time	X	E		E	E	E	E
Peculiar	Part time		NI	NI	NI	NI	NI	NI
Pleasant Hill	Part time	X	E	E	NI	E	E	E
Raymore	Part time	X	E	E	E	E	E	E
Clay County	Full time	X	E	E	NI	E	E	NI
Excelsior Springs	Part-time	X	E	E	NI	E	E	NI
Gladstone	Full-time	X	E	E	E	E	E	E
Kearney	Full time	X	E	NI	E	E	E	E
Lawson	Part-time	X	NI	NI	NI	NI	NI	NI
Liberty	Full time	X	E	E	E	E	E	E
Pleasant Valley	Part time		E	NI	NI	NI	NI	NI
N. Kansas City	Full time	X	E	E	E	E	E	E
Smithville	Full time		E	NI	NI	E	E	E
Jackson County	Full time		E	E	E	E	E	E
Blue Springs	Full time	X	E	E	E	E	E	E
Grain Valley	Part-time							
Grandview	Part time	X	E	E	NI	E	E	E
Greenwood	Part time							
Independence	Full time	X	E	E	NI	E	E	E
Kansas City, Mo.	Part time	X	E	E	NI	E	E	E
Lee's Summit	Part time	X	E	E	NI	NI	E	E
Oak Grove	Part time	X	E	E	NI	E	E	E
Raytown	Part-time	X	E	NI	NI	E	E	E
Platte County	Full time	X	E	E/NI	E	E	E	E
Farley	Part time	X	NI			NI	NI	
Lake Waukomis	Full time	X	NI	NI				
Northmoor	Part time							
Parkville	Full time	X	E	E	E	E	E	E
Platte City	Full time	X	E	E	E/NI	E	E	E
Platte Woods	Part-time							
Riverside	Full time	X	E	E	E	E	E	E
Tracy	Part time	X	NI					
Weatherby Lake	Full time							
Weston	Full time		E	E	E	E	E	E
Ray County	Part time	X	NI	NI	NI	NI	NI	NI
Richmond	Part time	X	E/NI	E/NI	E/NI	E/NI	E/NI	E/NI

E = Effective NI = Needs Improvement E/NI = Effective and Needs Improvement

Community Rating System Participants

Five jurisdictions are currently participants in NFIP's voluntary Community Rating System (CRS) incentive program. This program recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. See **Table 3.31** for details on current activities. X = Included

Table 3.30: Status of Participating Jurisdictions in the CRS Program					
CRS ACTIVITIES	**Independence**	**Kansas City, Mo.**	**Platte Co**	**Blue Springs**	**Lee's Summit**
	Class 8	*Class 8*	*Class 6*	*Class 7*	*Class 9*
	300 Public Information Activities				
Elevation Certificates	X	X	X	X	
Status			*Scheduled*		
Map Information Service	X	X	X		
Status	*Scheduled*	*Improved/Scheduled*	*Scheduled*		
Outreach Projects	X	X	X	X	
Status	*Scheduled*	*Improved/Scheduled*	*Scheduled*		
Hazard Disclosure			X		
Status		*Improved/Scheduled*	*Scheduled*		
Flood Protection Info	X	X	X		
Status	*Scheduled*		*Scheduled*		
Flood Protection Asst.			X		
Status			*Scheduled*		
Flood Insurance Promo		X	X		
Status		*Improved*	*Scheduled*		
	400 Mapping & Regulations				
Floodplain Mapping	X	X	X	X	
Status		*Improved/Scheduled*	*Scheduled*		
Open Space Preservation	X	X	X		
Status		*Improved/Scheduled*	*Scheduled*		
Higher Regulatory Standards	X	X	X	X	
Status		*Improved/Scheduled*	*Scheduled*		
Flood Data Maintenance	X		X	X	
Status			*Scheduled*		
Stormwater Management	X		X		
Status			*Scheduled*		
	500 Flood Damage Reduction Activities				
Floodplain Mgmt Planning	X	X	X		
Status		*Improved/Scheduled*	*Scheduled*		
Acquisition and Relocation	X	X	X		
Status		*Improved/Scheduled*	*Scheduled*		
Flood Protection	X	X	X		
Status		*Improved/Scheduled*	*Scheduled*		
Drainage System Maintenance	X				
Status	*Scheduled*				
	600 Warning and Response				
Flood Warning and Response			X		
Status	*Scheduled*	*Scheduled*	*Scheduled*		
Levees			X		
Status	*Scheduled*		*Scheduled*		
Dams					
Status	*Scheduled*				
Does the HMP effort satisfy CRS requirements?			**Yes**		

3.3.7 School Profile Survey Findings

Table 3.31: School Plans and Policies Inventory					
1. EVACUATION					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District	Yes		Yes		
Harrisonville School District	Yes		Yes		
Pleasant Hill R-III School District	Yes	Yes	Yes		Have identified areas to go in case of emergency
Raymore-Peculiar School District	Yes	Yes	Yes		
Excelsior Springs School District	Yes				
Sherwood-Cass School District	Yes				
Lawson School District	Yes	Yes	Yes		
North Kansas City School District	Yes			Yes	
Smithville R-II School District	Yes	Yes	Yes	Yes	
Blue Springs School District	Yes			Yes	All buildings' evacuation plans are updated, and drills are conducted per RsMO.
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes		Yes	All buildings' evacuation plans updated
Independence School District	Yes		Yes		
Kansas City School District	Yes	Yes	Yes	Yes	Have identified areas to go in case of emergency.
Lee's Summit School District	Yes	Yes	Yes		
Oak Grove R-VI School District	Yes	Yes	Yes	Yes	Included in community, district LEOP
Metropolitan Community College	Yes	Yes	Yes	Yes	All evacuation plans have been updated
Park Hill School District	Yes	Yes	Yes	Yes	Adopted crisis manual/plan
Park University	Yes				
Platte County R-3 School District	Yes			Yes	Relocation sites updated; ID doors & spaces
Richmond School District	Yes	Yes	Yes		Adopted crisis manual/plan
West Platte R-II School District	Yes		Yes	Yes	

Table 3.31: School Plans and Policies Inventory (Continued)					
2. STORM SHELTER					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District	Yes			Yes	
Harrisonville School District	Yes	Yes	Yes	Yes	
Pleasant Hill R-III School District	Yes	Yes	Yes	Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Sherwood-Cass School District	Yes				Regular Tornado Drills conducted
Excelsior Springs School District	Yes	Yes			
Lawson School District	Yes	Yes	Yes		
North Kansas City School District	Yes	Yes	Yes		
Smithville R-II School District	Yes	Yes	Yes		
Blue Springs School District	Yes	Yes	Yes	Yes	All Buildings' Shelter plans are updated, and Drills are conducted per RsMO. Raptor Alert and SRP have been implemented district wide. 16 out of 22 school buildings have high wind shelters. 5 more will be completed by 2026.
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes		
Independence School District	Yes	Yes	Yes		
Kansas City School District	Yes	Yes	Yes	Yes	Tornado drills executed regularly
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes	Yes	Yes		
Metropolitan Community College	Yes	Yes	Yes	Yes	Have constructed storm shelter on every campus
Park Hill School District	Yes	Yes	Yes		
Park University	Yes		Yes		
Platte County R-3 School District	Yes				
West Platte R-II School District	Yes		Yes		Built storm shelter as part of a gym project
Richmond School District	No				

Table 3.31: School Plans and Policies Inventory (Continued)					
3. SHELTER-IN-PLACE					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District	Yes				
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes	Yes	Yes	Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	Updated to address active shooter
Excelsior Springs School District	Yes			Yes	
Sherwood-Cass School District	Yes				Regular shelter in place drills
Lawson School District	Yes				
North Kansas City School District	Yes			Yes	
Smithville R-II School District	Yes		Yes	Yes	
Blue Springs School District	Yes				All Buildings' Shelter Plans are updated & drills are conducted per RsMO, Raptor & SRP have been implemented district-wide.
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes	Yes	
Independence School District	Yes		Yes		
Kansas City School District	Yes	Yes	Yes	Yes	District wide active shooter training annually and training module at Franklin Operations Center
Lee's Summit School District	Yes		Yes	Yes	
Oak Grove R-VI School District	Yes		Yes		
Metropolitan Community College	Yes	Yes	Yes	Yes	Ongoing installation of surveillance equipment across campuses. Upgraded communications systems allowing communications across jurisdictional lines between MCC and other law enforcement agencies and emergency service providers.
Park Hill School District	Yes	Yes	Yes	Yes	Adopted crisis manual/plan
Park University	Yes				

Platte County R-3 School District	Yes		Yes		
West Platte R-II School District	Yes			Yes	
Richmond School District	Yes		Yes		Adopted crisis manual/plan

Table 3.31: School Plans and Policies Inventory (Continued)

4. INFECTIOUS DISEASE					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District	Yes				
Harrisonville School District	Yes	Yes	Yes		
Pleasant Hill R-III School District	Yes		Yes	Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District	Yes			Yes	
Sherwood-Cass School District					
Lawson School District					
North Kansas City School District	Yes				Coordinate with Health Departments
Smithville R-II School District	Yes	Yes	Yes		
Blue Springs School District					Have Partnership with Jackson Co Health Dept. (MOU executed) for POD locations and FOG in-place.
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes		Yes		COVID Plan
Independence School District	Yes				
Kansas City School District	Yes	Yes	Yes	Yes	Procedures are in place using health dept resources
Lee's Summit School District	Yes		Yes		
Oak Grove R-VI School District					
Metropolitan Community College	Yes	Yes	Yes	Yes	COVID plan in place. MCC implemented contact tracing, monitored entry points, online instructional modalities, cleaning/sanitizing stations with policies and phased reopening of its campuses, infection disease policy in place.

Park Hill School District	Yes	Yes	Yes		
Park University					
Platte County R-3 School District					
West Platte R-II School District					
Richmond School District	Yes	Yes	Yes		

Table 3.31: School Plans and Policies Inventory (Continued)					
5. WATER CONSERVATION MEASURES					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District					
Harrisonville School District					
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District					
Sherwood-Cass School District					
Lawson School District					
North Kansas City School District					
Smithville R-II School District					
Blue Springs School District					
Fort Osage R1 School District					
Grain Valley School District	Yes				
Independence School District					
Kansas City School District	Yes	Yes			Maintenance staff does regular checks
Lee's Summit School District					
Oak Grove R-VI School District					
Metropolitan Community College	Yes	Yes	Yes	Yes	Majority of campus faucets and flush valves are on motion sensors and low flow

Park Hill School District	Yes	Yes	Yes	Yes	Some older bldgs. Do not have automatic on/off faucets.
Park University					
Platte County R-3 School District					
West Platte R-II School District					
Richmond School District	Yes				

Table 3.31: School Plans and Policies Inventory (Continued)					
6. SECURITY PLAN (Intruder, Lockdown)					
School Entity	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Archie R-V School District	Yes		Yes	Yes	
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes		Yes	Yes	Adopted crisis manual plan
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Sherwood-Cass School District	Yes				Replaced windows and doors, installed locks and alarms
Excelsior Springs School District	Yes	Yes	Yes	Yes	
Lawson School District	Yes				
North Kansas City School District	Yes	Yes	Yes	Yes	
Smithville R-II School District	Yes	Yes			
Blue Springs School District	Yes				All Buildings Intruder/Lockdown plans are updated, and Drills are conducted per RsMO. Raptor Alert and SRP have been implemented district wide. Intruder training with all district staff conducted annually. Metal Detectors (wands) at all secondary buildings. Protective window film at all ground level entry doors and the majority of windows. Secure perimeter and Access Control in place.
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes	Yes	Intruder drills; trained/certified staff members
Independence School District	Yes	Yes	Yes		Updated all bldgs. With secure entry
Kansas City School District	Yes	Yes	Yes	Yes	Metal detectors at all secondary schools, security plans in place, training for staff/children regarding intruders.
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes	Yes	Yes		

Metropolitan Community College	Yes	Yes	Yes	Yes	Installed intrusion detection systems and security cameras, implemented a mass notification system, as well as the Rave texting emergency response system.
Park Hill School District	Yes	Yes	Yes	Yes	
Park University	Yes				
Platte County R-3 School District	Yes	Yes	Yes	Yes	Adopted crisis manual/plan; trained staff for violent intruder
West Platte R-II School District	Yes			Yes	Yearly practices as part of plan and policies
Richmond School District					

Table 3.31: School Plans and Policies Inventory (Continued)						
7. OTHER PLANS						
School Entity	**Plan Type**	**Plan Adopted**	**Includes Projects Identified for Mitigation Strategy**	**Used to Implement Mitigation Actions**	**Reviewed for HMP Update**	**Measures incorporated into HMP, if applicable**
Blue Springs School District	Security resource					1400+ cameras in place. More cameras as needed with 5mp upgrades. Implemented in the 24-25SY: DataSource used to conduct national background checks on all volunteers (1500 screening in 24-25SY). E911 migration complete.
Excelsior Springs School District	Active Shooter/Schoolwide Crisis Management Plan Guide	Yes	Yes	Yes	Yes	Install cameras as needed; all building lobbies secured to prevent visitors beyond the access point; evaluate and improve security and safety of buildings and access; all visitors must submit to background check; adopted plan at Nov 2019 Board of Education meeting.
Kansas City School District	Bullying and Individual Assaults	Yes				Added curriculum to raise awareness
Kansas City School District	Vandalism	Yes	Yes	Yes	Yes	Implementing integrated security system
Kansas City School District	Active Shooter and/or Intruder	Yes	Yes	Yes	Yes	Implementing integrated security system
Park Hill School District	Active Shooter Training and Crisis Plan	Yes	Yes	Yes	Yes	Security camera and communication
Metropolitan Community College	District-wide EAS	Yes	Yes	Yes	Yes	Creation of Continuity of Business Operations Plan
2025 Independence School District	District Wide EAS	Yes	Yea	Yes		Implemented district wide Emergency Alert System Raptor

Table 3.31: School Plans and Policies Inventory (Continued)					
School Entity	8. Updated Building Codes	9. Provisions to Elevate Construction	10. Strengthen Construction	11. Safe Room Requirements	Profile Survey Completed
Archie R-V School District					Yes
Harrisonville School District					Yes
Pleasant Hill R-III School District	Yes	Yes	Yes		Yes
Raymore-Peculiar School District					Yes
Excelsior Springs School District					Yes
Sherwood-Cass School District			Yes		Yes
Lawson School District					Yes
North Kansas City School District					Yes
Smithville R-II School District					Yes
Blue Springs School District	Yes	Yes	Yes	Yes	Yes
Fort Osage R1 School District	Yes				Yes
Grain Valley School District					Yes
Independence School District	Yes				Yes
Kansas City School District	Yes	Yes	Yes		Yes
Lee's Summit School District	Yes	Yes	Yes	Yes	Yes
Oak Grove R-VI School District	Yes	Yes	Yes	Yes	Yes
Metropolitan Community College	Yes	Yes	Yes	Yes	Yes
Park Hill School District	Yes	Yes	Yes	Yes	Yes
Park University	Yes				Yes
Platte County R-3 School District	Yes	Yes		Yes	Yes
West Platte R-II School District			Yes	Yes	Yes
Richmond School District					

Mitigation Projects Awarded Funding

The state of Missouri reported on Mitigation grants awarded to local jurisdictions since 1993. The following school districts have received grants primarily for safe room projects to mitigate the impacts from tornadoes.

CASS COUNTY

Archie R-V School District
Safe Room Structure – Awarded 4/30/2013; Federal $1,087,661 Non-federal $362,554

Belton School District
Multi-Purpose Safe Room – Awarded (7/28/2015); Federal $1,626,664 Non-federal $542,222

CLAY COUNTY

Smithville School District
Safe Room Structure – Awarded 12/13/2010; Federal $1,191,237 Non-federal $397.079

Metropolitan Community Colleges District
Maple Woods Community Safe Room – Awarded 8/31/2005; Federal $2,398,603 Non-federal $799,534

Excelsior Springs School District
Safe Room Structure – Awarded 3/31/2023 Total Project $1m009,572

JACKSON COUNTY

Oak Grove School District
Community Safe Room – Awarded 12/07/2012; Federal $2,098,627 Non-federal $699,543

Blue Springs School District
James Lewis Elementary School Safe Room – Awarded 5/3/2016; Federal $1,417,317 Non-federal $472,439

Metropolitan Community Colleges District
Mitigation Planning – Awarded 3/30/2004; Federal $100,000 Non-federal $33,334
Blue River Community Safe Room – Awarded 8/31/2005; Federal $1,273,631 Non-federal $419,101
Longview Community Safe Room – Awarded 8/31/2005; Federal $2,553,286 Non-federal $851,095
Pioneer Campus Safe Room – Awarded 7/10/2005; Federal $566,360 Non-federal $188,787
Penn Valley Community Safe Room – Awarded 8/31/2005; Federal $3,000,000 Non-federal $1,384,811
BTC Community Safe Room – Awarded 8/31/2005; Federal $993,853 Non-federal $331,284

PLATTE COUNTY

North Platte R-I School District
Safe Room – Awarded 7/10/2014; Federal $362,293 Non-federal $120,765

RAY COUNTY

Richmond R-XVI School District
Safe Room – Awarded 6/11/2013; Federal $587,322 Non-federal $195,774

3.4 Regional Capabilities

In addition to local capabilities there are regional capabilities that aid in mitigation efforts. These regional capabilities were included in the community profile survey for jurisdictions' consideration as noted above.

Warning Systems

The planning area still utilizes a variety of warning systems discussed in the 2020 Plan update. These include Project Community Alert; Kansas City Scout; NWS advisories, watches, warnings; NOAA weather radio; EMWIN through the National Weather Service; and, as necessary, the Emergency Alert System. River and stream sensors also monitor water level and stream flow in certain flood-prone waterways. Most school districts in the region provide text/voice/email messaging to the parents of their students to convey information regarding school closings or emergencies.

Virtually all of the urban and suburban portions (i.e., major population centers) of the Kansas City metropolitan area have outdoor warning sirens. However, some rural areas and smaller jurisdictions tend to rely on radio and television broadcasts and the Internet. As the use of social media grows, technological advances have created a new layer of complexity in how warnings are received, disseminated and coordinated.

Community Partnerships

As identified in the 2020 Plan update, many community partnerships and organizations enhance the planning area's overall capability to mitigate and recover from disasters. In particular, emergency management committees have matured since the last plan update. Existing efforts strive to preserve these connections and allow for continued coordination and improved community preparedness. For example, the inclusion of faith-based organizations and organizations serving the functionality and accessibility needs of vulnerable populations. Examples of these community partnerships, committees and programs include:

- Metropolitan Emergency Managers Committee (MEMC)
- Mid-America Local Emergency Planning Committee
- Mid-America Regional Council Emergency Rescue Committee
- Metropolitan Official Health Agencies of the Kansas City Area
- Regional Public Information Officers Organization (RAPIO)
- Regional Homeland Security Coordinating Committee
- MEMC Integrated Warning Team
- Regional 9-1-1 System
- Metropolitan Chapter, American Public Works Association
- SAVE Coalition
- Kansas City Organizations Active in Disaster
- Community Emergency Response Teams
- Medical Reserve Corps of Greater Kansas City
- Community Disaster Resiliency Network

Stormwater Management Design Standards: A consortium of over 30 local governments provided funds to MARC to support the update of the resilience-focused stormwater engineering standards known as APWA Section 5600. MARC is facilitating the process to update these standards with consulting support from a team lead by Burns and McDonnell under the auspices of the Kansas City Chapter of the American Public Works Association (APWA).

Reducing the risk of flooding is a shared concern for stormwater management engineers, natural hazard mitigation, and sustainability planners. Given that the Kansas City region has a long history of flooding, and that flood risks are expected to increase in the future, this project has a strong nexus to the hazard mitigation plan. Adoption and implementation of these new standards by participating communities would reduce future risks and vulnerabilities to flooding across the region.

The consultant expects to complete the draft standards in the spring of 2025, and gain feedback from participating local governments. Subsequently, members of the local APWA chapter are anticipated to vote on the adoption of the standards in June 2025. Local governments would then adopt and implement the standards. MARC will continue to provide training and coordination among local governments to support the implementation of the new standards. MARC is encouraging local governments to consider a mitigation action for the new plan to include adoption of the new standards.

The following local governments provided financial support to MARC for this APWA standards' update, demonstrating their interest in new stormwater standards as important mitigation measures.

- Kansas City, MO
- Excelsior Springs, MO
- Riverside, MO
- Independence, MO
- Liberty, MO
- North Kansas City, MO
- Gladstone, MO
- Parkville, MO

The Kansas City Climate Action Coalition formed by local elected officials in 2018 held regular convenings, the largest in September 2019 with over 700 elected and appointed local government officials and members of the public learning about the impacts of a changing climate and steps that could be taken to mitigate impacts. A Climate Action Playbook was released in late fall 2019, a greenhouse gas inventory and reduction plan for the region was completed in 2020 and an update to the Climate Action Playbook was completed in 2024.

Safe Shelter Partnership, advanced by the Eastern Jackson County Emergency Management group (Jackson County/Independence), continues to work in conjunction with the Faith-Based Organization Initiative. Efforts have increased the capability of local faith-based organizations to help congregations, church facilities and surrounding community to be prepared in advance of a crisis or disaster. *Community Disaster Resiliency Network* established by MARC in 2018 brings local emergency managers, representatives of nonprofit organizations serving vulnerable populations together to work toward

increasing the resiliency of the agencies and their clients during and after disaster events. Special groups focusing on older adults, young children and faith-based organizations meet on a regular basis. *Core 4* is a collaborative effort between four of the region's largest jurisdictions: City of Kansas City and Jackson County in Missouri and Johnson and Wyandotte Counties in Kansas. This initiative brings together department directors with city/county managers and department heads on a regular basis to collaborate on specific issues and increase communications. This collaboration was used successfully to increase coordination during winter weather events in the past several years. Eastern Jackson County communities, particularly Lee's Summit, Independence and Blue Springs, are also working together. MARC is pursuing additional opportunities for shared services.

Media Coverage and Public Awareness

A wide variety of broadcast and print media outlets serve the region. A list of the Kansas City area's television stations, radio stations and newspapers were provided in the 2010 Plan. The media coverage remains an important venue for information dissemination. Additionally, local governments and other stakeholders involved in hazard mitigation conduct outreach and awareness through the Internet and social media communication methods. The Metropolitan Emergency Managers Committee and Regional Association of Public Information Officers work together on a website for the public on emergency preparedness, www.preparemetrokc.org and on other promotion regarding preparedness for natural hazards.

[i] FEMA. Worksheets 4.1- 4.3 Capability Assessment Worksheet, Safe Growth Audit, National Flood Insurance Program Worksheet. Local Mitigation Planning Handbook, March 2013.

Cass County	Cass County	Belton	Harrisonville	Lake Winnebago	Pleasant Hill	Raymore
Land Use						
Do the jurisdiction's land use policies define an urban services area?	Yes	No	Yes	No	No	No
Do the land use policies contain provisions for hazard zone identification?	Yes	No	Yes	No	No	No
Do the land use policies discourage development or redevelopment within natural hazard areas?	Yes	No	Yes	No	No	No
Does the future land use map clearly identify natural hazard areas?	No	No	Yes	No	No	No
Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	Yes	No	Yes	No	No	No
Do the land use policies require storm water engineering studies prior to development?	Yes	No	Yes	No	No	No
How does your jurisdiction assess the potential impacts of land use changes on hazard vulnerability and disaster risk?						
We conduct regular assessments of land use patterns and hazards.						
We collaborate with urban planning experts to analyze potential impacts.			X			
Land use changes are not currently a focus in our hazard assessments.				X		
We are exploring methods to integrate land use considerations.	X					
How does your jurisdiction engage with urban planners and land use experts to inform hazard mitigation strategies?						
We regularly collaborate with planners to integrate land use considerations.			X			
We include urban planners in discussions, but improvements are needed.						
Urban planning perspectives are not currently integrated into our strategies.				X		
We are considering ways to involve urban planners in our planning process.	X					
Are there specific areas within your jurisdiction that are identified as vulnerable due to recent or anticipated land use changes?						
Yes, we have identified vulnerable areas due to land use changes.			X			
We consider general vulnerability, but specific areas are not defined.	X					
Vulnerability due to land use changes is not a current focus.				X		
We are in the process of assessing vulnerability related to land use.						
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to coordinate land use changes for hazard mitigation?						
Yes, we have established regional collaborations for this purpose.			X			
We consider regional coordination, but it is not fully integrated.	X					
Land use coordination is not a significant part of our plans.				X		
We are considering the potential for regional coordination.						
How does your jurisdiction plan to communicate land use changes and their potential impact on hazard vulnerability to the public?						
We have comprehensive communication plans for land use changes.						
We include land use information in our general communication efforts.	X		X			
Land use communication is not a significant part of our plans.				X		
We are developing strategies for effective land use communication.						
Is your jurisdiction actively involved in advocating for sustainable land use practices and policies at higher levels of government?						
Yes, we actively advocate for sustainable land use practices.						
We participate in advocacy efforts, but it is not a primary focus.			X			

Sustainable land use advocacy is not a current priority for us.				X		
We are considering engagement in land use advocacy.	X					
Describe any land use measures incorporated into hazard mitigation plan.	Adoption of International Building Codes Flood Protection requirements			none		
Transportation						
Does the transportation plan limit access to hazard areas?	No	No	No	No	No	No
Is transportation policy used to guide growth to safe locations?	No	No	Yes	No	No	No
Are movement systems designed to function under disaster conditions (e.g., evacuation)?	No	No	Yes	No	No	No
Describe any transportation measures incorporated into hazard mitigation plan.	Identification of major road routes within the county and identified resources for movement of people.					
Environmental Management						
Are environmental systems that protect development from hazards identified and mapped?	Yes	No	Yes	No	No	No
Do environmental policies maintain and restore protective ecosystems?	No	No	Yes	No	No	No
Do environmental policies provide incentives to development located outside protective ecosystems?	No	No	No	No	No	No
On a scale of 1 - 5 how concerned is your jurisdiction about climate change?	4		3	2		
What are some of your jurisdiction's biggest concerns about climate change?	Flooding		Fuel Consumption, water supply			
How does your jurisdiction currently assess the potential impacts of climate change on hazards and disaster risks						
We regularly conduct climate vulnerability assessments.						
We consider historical data to estimate future changes.						
We collaborate with climate experts and research institutions.						
Climate change impacts are not yet integrated into our assessments.	X		X	X		
To what extent does your jurisdiction account for the increased frequency and intensity of climate-related hazards?						
Climate-related hazards are not explicitly addressed in our plan.	X					
We consider climate change, but it is not a primary focus.						
We are in the process of developing strategies for climate-related hazards.						
We have specific strategies to address climate-related hazards.			X	X		

What are those strategies?	n/a		Reviewing site development and infrastructure design standards to incentivize the use of green development practices and to ensure compliance with the MARC 2050 Climate Action Plan to mitigate effects of industry on the environment.			
How does your jurisdiction engage with climate science and data to inform hazard mitigation strategies?						
We regularly update our strategies based on the latest climate data.						
We incorporate climate projections into long-term planning.						
Climate science has a minimal impact on our mitigation plans.						
We are still exploring how to incorporate climate data effectively.	X		X	X		
How does your jurisdiction plan to integrate climate adaptation measures into its hazard mitigation strategies?						
We have clear adaptation measures outlined in our plan.						
We are considering adaptation, but it is not fully integrated yet.						
Climate adaptation is not yet addressed in our strategies.						
We are currently exploring options for climate adaptation.	X		X	X		
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to address shared climate-related hazards?						
Yes, we have established regional collaborations for this purpose.	X					
We consider regional collaboration but have limited initiatives.			X			
Climate-related collaboration is not a current focus.				X		
We are considering the potential for regional collaboration.						
How does your jurisdiction plan to communicate climate-related risks and adaptation strategies to the public and stakeholders?						
We have comprehensive communication plans for climate risks.						
We include climate information in our general communication efforts.			X			
Climate communication is not a significant part of our plans.				X		
We are developing strategies for effective climate communication.	X					
Is your jurisdiction actively involved in advocacy for climate change mitigation policies at higher levels of government?						

Yes, we actively advocate for climate mitigation policies.						
We participate in advocacy efforts, but it is not a primary focus.						
Climate advocacy is not a current priority for us.			X			
We are considering engagement in climate advocacy.	X					
Describe any environmental management measures incorporated into hazard mitigation plan.	- Storage of hazardous substances must be set back 150 feet from any active stream channel or water body. -Submit an operational plan describing how products will be stored, processed, manufactured or destroyed. -The storage or processing of materials that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal or plant life is prohibited.					
Public Safety						
Are the goals and policies of the comprehensive plan related to those of the HMP?	No	No	Yes	No	No	No
Is safety explicitly included in the plan's growth and development policies?	No	No	Yes	No	No	No
Does the monitoring and implementation section of the plan cover safe growth objectives?	No	No	Yes	No	No	No

Describe any public safety measures incorporated into hazard mitigation plan.	- Identify low-water crossings - Posted signage for flood areas - Notify the public of severe weather using - Coordinate with Public Works for setting up barricades		Dual-role Certified Emergency Managment Director on staff, Mutual aid agreements with are agencies, Warning systems for general public, update Emergency Operations Plan.	none at present time		
Building Codes						
Does the building code contain provisions to elevate construction to withstand hazard forces?	Yes	Yes	Yes	No	No	No
Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?	Yes	Yes	Yes	No	No	No
Does the building code contain safe room or storm shelter requirements?	No	No	Yes	No	No	No
Describe any building code measures incorporated into hazard mitigation plan.	Adoption of International Codes - National Electrical Code - Post Frame Building Standards for agricultural and residential accessory buildings - Minimum construction standards					
Zoning Ordinances						
Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	Yes	No	Yes	No	No	No
Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?	Yes	No	Yes	No	No	No
Does the zoning ordinance contain mitigation performance standards?	No	No	Yes	No	No	No

Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	Yes	No	Yes	No	No	No
Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	Yes	No	Yes	No	No	No
Describe any zoning ordinance measures incorporated into hazard mitigation plan.	Development Requirements: -Residences must be elevated at least 2 feet above base flood elevation -Must be anchored to prevent flotation/collapse -Requires permit for any development in flood hazard areas -Prohibits development that would increase flood levels			none at present time		
Subdivision Regulations						
Do the subdivision regulations contain an adopted hazard disclosure?	No	No	No	No	No	No
Do subdivision regulations contain a provision for soil report evaluations?	Yes	No	No	No	No	No
Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	No	No	No	No	No	No
Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	No	No	Yes	No	No	No
Do the regulations allow density transfers where hazards exist?	No	No	No	No	No	No

Describe any subdivision regulation measures incorporated into hazard mitigation plan.	Division of one parcel into two parcels by a single dividing line - Cannot split a lot more than once under lot split procedures Large Parcel Subdivisions: - Division of parent parcel into multiple parcels each exceeding 20 acres - Not intended for further development/construction Minor Subdivisions: - Division into 2-5 parcels Regular Subdivisions Division into 2+ parcels requiring infrastructure/im			none at present time		
Capital Improvement Program and Infrastructure Policies						
Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	No	No	No	No	No	No
Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	No	No	No	No	No	No
Does the capital improvement program provide funding for hazard mitigation projects?	No	No	No	No	No	No
Describe any capital improvement program and infrastructure policy measures incorporated into hazard mitigation plan.	Does not currently have a capital improvement program			none		
Underserved Populations						
How does your jurisdiction identify and define underserved populations for the purpose of hazard mitigation planning?						
We rely on census data and demographics.						
We conduct community assessments and consultations.						

We use a combination of data sources and community input.	X		X			
We have not explicitly defined underserved populations.				X		
What steps has your jurisdiction taken to assess the specific vulnerabilities and challenges faced by underserved populations during hazards and disasters?						
We have not yet focused on this aspect of vulnerability assessment.						
We have conducted vulnerability assessments targeting these populations.						
We have analyzed historical disaster impacts on different groups.						
We have engaged with community organizations to gather insights.	X		X			
List community organization(s):	Hospitals, domestic violence shelters, food banks, libraries, senior centers, long term care facilities, mental/behavioral health orgs (Compass), West Central Community Action Agency, coalitions		Community Non-profits, Community Heath organizations, Community Churches, Red Cross, Cass County Health Department, Take it to the Streets Organization, Harrisonville CAP,			
How does your jurisdiction plan to ensure equitable access to hazard information, evacuation plans, and emergency resources for all community members, including underserved populations?						
We use a variety of communication channels and languages.						
We work with community leaders to disseminate information.						
We have plans for accessible formats and resources.						
We are still developing strategies for inclusive communication.	X		X	X		
How does your jurisdiction intend to involve representatives from underserved populations in the hazard mitigation planning process?						
We have established advisory groups with diverse community members.						
We regularly hold public meetings to gather input.						
We collaborate with community-based organizations.	X					
We are exploring ways to improve community engagement.			X	X		
Are there plans to collaborate with local community organizations, NGOs, or advocacy groups that have expertise in working with underserved populations during hazards and disasters?						
Yes, we have established partnerships and collaborations.	X					
We are considering such collaborations for future efforts.			X			
We have not actively explored these partnerships yet.						

No, we do not plan to collaborate with external organizations.				X		
How does your jurisdiction plan to address financial barriers that might prevent underserved populations from accessing essential resources during emergencies?						
We have plans to provide subsidies or financial support.						
We are working on ways to ensure resource equity.	X					
Financial barriers are not a focus of our plans.						
We have not yet considered financial barriers.			X	X		
Does your jurisdiction plan to review and update its plan to reflect changes in the vulnerabilities and needs of underserved populations over time?						
Yes, we have a scheduled review process that includes this aspect.						
We plan to incorporate changes if they are significant.	X		X			
We have not yet considered regular updates for this purpose.						
No, we do not plan to review or update the plan.				X		
Do you have suggestions on how the community can actively engage underserved populations in the planning and decision-making process?	Specifically seeking out their participation in the planning process and ensuring that barriers to that participation are being addressed			this is a small upper class community that does no have an underserved population/		
Are there local organizations or community members who can act as advocates or liaisons to help communicate emergency information and resources to underserved populations?	Yes, community organizations, city/county leaders, libraries, schools		CASCO	no		
Access and Functional Needs						
Does your jurisdiction's Local Emergency Operations Plan address provisions for individuals with access and functional needs?	Yes	No	No	No	No	No
If no, when will the plan be updated to include these community members?			yes			
How does your jurisdiction currently identify individuals with access and functional needs within the community?						
Access and functional needs are not yet a focus in identification.						
We are exploring methods to identify these individuals.			X			
We maintain a registry of individuals with specific needs.						
We collaborate with community organizations to identify such individuals.	X					
List organization(s)	Hospitals, long-term care facilities		CASCO, School Dist			

To what extent are access and functional needs considered in your jurisdiction's plans?						
Access and functional needs are not explicitly addressed in our plan.			X	X		
We are in the process of developing strategies for these needs.						
We consider these needs, but they are not fully integrated.	X					
We have dedicated strategies to address access and functional needs.						
List strategies	The county has compiled information on the availability of local transportation resources including wheelchair-accessible buses.					
How does your jurisdiction engage with organizations that support individuals with access and functional needs in the planning process?						
We have active partnerships with such organizations.	X					
We collaborate occasionally, but it is not a consistent practice.			X			
We have not yet engaged with these organizations.				X		
We are considering ways to involve them in the planning process.						
Are there specific shelters or facilities designated to accommodate individuals with access and functional needs during emergencies?						
Yes, we have designated accessible shelters and facilities.						
We consider accessibility but do not have specific facilities.	X					
Accessibility is not a priority in our shelter planning.				X		
We are exploring options for accessible shelters.			X			
How does your jurisdiction ensure that emergency communication methods are accessible to individuals with various communication needs?						
We have accessible communication methods established.						
We consider diverse communication needs but need improvement.	X					
Accessibility in communication is not yet well addressed.			X	X		
We are developing plans for accessible communication.						
List methods	Radio, print, social media, multiple languages					
How does your jurisdiction plan to provide transportation assistance to individuals with mobility challenges during evacuations?						
We have established transportation assistance plans.						
We consider transportation but need clearer strategies.						
Transportation assistance is not yet part of our plans.				X		
We are discussing options for transportation assistance.	X		X			

Does your jurisdiction actively engage individuals with access and functional needs in your planning processes?						
Yes, we involve them as key stakeholders.						
We involve them to some extent, but improvements are needed.						
We have not yet engaged them in planning discussions.	X			X		
We are considering ways to involve them in the process.			X			
How does your jurisdiction plan to ensure that recovery efforts after a disaster prioritize the unique needs of individuals with access and functional needs?						
We have established strategies for inclusive recovery.						
We consider recovery needs, but more specific plans are needed.	X					
Recovery efforts are not yet focused on these needs.				X		
We are discussing potential recovery strategies.			X			
Other						
Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?	No	No	Yes	No	No	No
Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	No	No	Yes	No	No	No
Do economic development or redevelopment strategies include provisions for mitigation of natural resources?	No	No	Yes	No	No	No

Clay County	Clay County	Excelsior Springs	Gladstone	Lawson	Kearney	Liberty	Pleasant Valley	North Kansas City	Pleasant Valley	Smithville
Land Use										
Do the land use policies define an urban services area?	Yes	No	No	Yes	No	No	No	Yes	No	No
Do the land use policies contain provisions for hazard zone identification?	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Do the land use policies discourage development or redevelopment within natural hazard areas?	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Does the future land use map clearly identify natural hazard areas?	Yes	No	No	No	Yes	Yes	No	No	No	Yes
Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes
Do the land use policies require storm water engineering studies prior to development?	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
How does your jurisdiction assess the potential impacts of land use changes on hazard vulnerability and disaster risk?										
We conduct regular assessments of land use patterns and hazards.	X		X					X		
We collaborate with urban planning experts to analyze potential impacts.					X					
Land use changes are not currently a focus in our hazard assessments.		X		X		X			X	X
We are exploring methods to integrate land use considerations.										
How does your jurisdiction engage with urban planners and land use experts to inform hazard mitigation strategies?										
We regularly collaborate with planners to integrate land use considerations.	X		X			X		X		
We include urban planners in discussions, but improvements are needed.					X					
Urban planning perspectives are not currently integrated into our strategies.		X		X					X	X
We are considering ways to involve urban planners in our planning process.										
Are there specific areas within your jurisdiction that are identified as vulnerable due to recent or anticipated land use changes?										
Yes, we have identified vulnerable areas due to land use changes.			X					X		
We consider general vulnerability, but specific areas are not defined.					X					
Vulnerability due to land use changes is not a current focus.	X	X		X		X			X	X
We are in the process of assessing vulnerability related to land use.										
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to coordinate land use changes for hazard mitigation?										
Yes, we have established regional collaborations for this purpose.	X		X							
We consider regional coordination, but it is not fully integrated.		X				X		X		
Land use coordination is not a significant part of our plans.				X	X				X	X
We are considering the potential for regional coordination.										
How does your jurisdiction plan to communicate land use changes and their potential impact on hazard vulnerability to the public?										
We have comprehensive communication plans for land use changes.	X					X		X		
We include land use information in our general communication efforts.			X		X				X	X
Land use communication is not a significant part of our plans.		X		X						
We are developing strategies for effective land use communication.										
Is your jurisdiction actively involved in advocating for sustainable land use practices and policies at higher levels of government?										
Yes, we actively advocate for sustainable land use practices.			X							
We participate in advocacy efforts, but it is not a primary focus.						X		X		
Sustainable land use advocacy is not a current priority for us.	X			X	X				X	X
We are considering engagement in land use advocacy.		X								
Describe any land use measures incorporated into hazard mitigation plan.			All development plans must be approved through a multilayer review to include Fire/EM approval before being submitted to Planning and Zoning		development in floodplain areas is restricted per the floodplain ordinance					
Transportation										
Does the transportation plan limit access to hazard areas?	Yes	No	No	No	No	No	No	No	No	No
Is transportation policy used to guide growth to safe locations?	Yes	No	No	No	No	No	No	No	No	No
Are movement systems designed to function under disaster conditions (e.g., evacuation)?	Yes	No	No	No	No	No	No	No	No	No
Describe any transportation measures incorporated into hazard mitigation plan.			Utilization of Mass Transit resources for MCI or evacuation needs	No						
Environmental Management										
Are environmental systems that protect development from hazards identified and mapped?	No	No	Yes	No	Yes	Yes	No	No	No	No
Do environmental policies maintain and restore protective ecosystems?	Yes	No	Yes	No	No	Yes	No	Yes	No	No
Do environmental policies provide incentives to development located outside protective ecosystems?	No	No	No	No	No	No	No	No	No	No
On a scale of 1 - 5 how concerned is your jurisdiction about climate change?	3		3	3	4	3	1	4	2	
What are some of your jurisdiction's biggest concerns about climate change?	Changing weather patterns, more severe storms, and changes in weather seasons, affect on crops, serve changes in temperatures		Impacts to infrastructure and at-risk demographic groups such as the elderly and young.	Severe weather	flash flooding during rain events	Drought & Flooding	No concern	Unknown		Cost to mitigate
How does your jurisdiction currently assess the potential impacts of climate change on hazards and disaster risks										
We regularly conduct climate vulnerability assessments.										
We consider historical data to estimate future changes.		X	X					X		X
We collaborate with climate experts and research institutions.										
Climate change impacts are not yet integrated into our assessments.	X			X	X	X	X		X	
To what extent does your jurisdiction account for the increased frequency and intensity of climate-related hazards?										
Climate-related hazards are not explicitly addressed in our plan.				X	X	X	X		X	
We consider climate change, but it is not a primary focus.	X	X	X					X		X
We are in the process of developing strategies for climate-related hazards.										
We have specific strategies to address climate-related hazards.										
What are those strategies?			Built into existing extreme weather incidents			Other than discouraging development in floodplain, stream or riparian corridors, we do not address this issue.	N/A	Done via Community Development.		
How does your jurisdiction engage with climate science and data to inform hazard mitigation strategies?										
We regularly update our strategies based on the latest climate data.			X							
We incorporate climate projections into long-term planning.	X									
Climate science has a minimal impact on our mitigation plans.		X		X	X	X	X	X	X	X
We are still exploring how to incorporate climate data effectively.										
How does your jurisdiction plan to integrate climate adaptation measures into its hazard mitigation strategies?										
We have clear adaptation measures outlined in our plan.										
We are considering adaptation, but it is not fully integrated yet.			X							
Climate adaptation is not yet addressed in our strategies.	X	X		X	X	X	X	X	X	X
We are currently exploring options for climate adaptation.										
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to address shared climate-related hazards?										
Yes, we have established regional collaborations for this purpose.	X		X							
We consider regional collaboration but have limited initiatives.										
Climate-related collaboration is not a current focus.		X		X	X	X	X	X	X	X
We are considering the potential for regional collaboration.										
How does your jurisdiction plan to communicate climate-related risks and adaptation strategies to the public and stakeholders?										
We have comprehensive communication plans for climate risks.										
We include climate information in our general communication efforts.	X		X							
Climate communication is not a significant part of our plans.		X		X	X	X	X	X	X	X
We are developing strategies for effective climate communication.										
Is your jurisdiction actively involved in advocacy for climate change mitigation policies at higher levels of government?										
Yes, we actively advocate for climate mitigation policies.			X							
We participate in advocacy efforts, but it is not a primary focus.								X		
Climate advocacy is not a current priority for us.	X	X			X	X	X		X	X
We are considering engagement in climate advocacy.										
Describe any environmental management measures incorporated into hazard mitigation plan.			Based on historical trends and predicted changes, resources are allocated to at-risk areas of the city.							
Public Safety										
Are the goals and policies of the comprehensive plan related to those of the HMP?	Yes	No	Yes	No	No	No	Yes	Yes	No	No
Is safety explicitly included in the plan's growth and development policies?	Yes	No	Yes	No	No	No	No	Yes	No	Yes
Does the monitoring and implementation section of the plan cover safe growth objectives?	Yes	No	No	No	No	No	No	No	No	No
Describe any public safety measures incorporated into hazard mitigation plan.			current planning is incorporating cyber, severe weather and infrastructure failure into planning and exercise.							
Building Codes										

Does the building code contain provisions to elevate construction to withstand hazard forces?	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No
Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No
Does the building code contain safe room or storm shelter requirements?	No	No	No	No	No	No	Yes	No	Yes	Yes
Describe any building code measures incorporated into hazard mitigation plan.			The City will be transitioning to the latest 2024 code set							
Zoning Ordinances										
Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Does the zoning ordinance contain mitigation performance standards?	Yes	No	Yes	No	No	No	No	Yes	Yes	Yes
Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No
Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes
Describe any zoning ordinance measures incorporated into hazard mitigation plan.										
Subdivision Regulations										
Do the subdivision regulations contain an adopted hazard disclosure?	No	No	Yes	No	No	No	Yes	No	Yes	No
Do subdivision regulations contain a provision for soil report evaluations?	No	No	Yes	No	Yes	No	No	No	Yes	Yes
Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	No	No	Yes	No	Yes	No	No	No	Yes	Yes
Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	Yes	No	Yes	No	Yes	Yes	No	No	Yes	Yes
Do the regulations allow density transfers where hazards exist?	Yes	No	Yes	No	Yes	No	No	No	No	No
Describe any subdivision regulation measures incorporated into hazard mitigation plan.										
Capital Improvement Program and Infrastructure Policies										
Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	Yes	No	Yes	No	No	No	No	No	Yes	Yes
Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	Yes	No	Yes	No	No	No	No	No	Yes	Yes
Does the capital improvement program provide funding for hazard mitigation projects?	Yes	No	Yes	No	No	No	No	No	Yes	Yes
Describe any capital improvement program and infrastructure policy measures incorporated into hazard mitigation plan.	The 5-year Capital Improvement Plan includes bridge projects and funding for culvert replacements.		Emergency notification and crisis communication policy							Stormwater improvements / flooding prevention
Underserved Populations										
How does your jurisdiction identify and define underserved populations for the purpose of hazard mitigation planning?										
We rely on census data and demographics.					X	X				X
We conduct community assessments and consultations.										
We use a combination of data sources and community input.	X		X				X			
We have not explicitly defined underserved populations.		X						X	X	
What steps has your jurisdiction taken to assess the specific vulnerabilities and challenges faced by underserved populations during hazards and disasters?										
We have not yet focused on this aspect of vulnerability assessment.		X			X	X		X	X	X
We have conducted vulnerability assessments targeting these populations.										
We have analyzed historical disaster impacts on different groups.	X									
We have engaged with community organizations to gather insights.							X			
List community organization(s):			Clay County Senior Services, MODHHS, Census, City Data Local NGO's, United Way, A Turning Point.						Pleasant Valley Civic Organization Pleasant Valley Seniors	
How does your jurisdiction plan to ensure equitable access to hazard information, evacuation plans, and emergency resources for all community members, including underserved populations?										
We use a variety of communication channels and languages.			X				X	X		
We work with community leaders to disseminate information.		X								
We have plans for accessible formats and resources.										
We are still developing strategies for inclusive communication.	X				X	X			X	X
How does your jurisdiction intend to involve representatives from underserved populations in the hazard mitigation planning process?										
We have established advisory groups with diverse community members.			X				X			
We regularly hold public meetings to gather input.		X							X	
We collaborate with community-based organizations.	X									
We are exploring ways to improve community engagement.					X	X		X		X
Are there plans to collaborate with local community organizations, NGOs, or advocacy groups that have expertise in working with underserved populations during hazards and disasters?										
Yes, we have established partnerships and collaborations.	X	X	X							
We are considering such collaborations for future efforts.					X					
We have not actively explored these partnerships yet.						X	X	X	X	X
No, we do not plan to collaborate with external organizations.										
How does your jurisdiction plan to address financial barriers that might prevent underserved populations from accessing essential resources during emergencies?										
We have plans to provide subsidies or financial support.							X			
We are working on ways to ensure resource equity.			X							
Financial barriers are not a focus of our plans.	X	X			X	X				X
We have not yet considered financial barriers.				X				X	X	
Does your jurisdiction plan to review and update its plan to reflect changes in the vulnerabilities and needs of underserved populations over time?										
Yes, we have a scheduled review process that includes this aspect.			X							
We plan to incorporate changes if they are significant.	X						X			
We have not yet considered regular updates for this purpose.		X		X	X	X		X		
No, we do not plan to review or update the plan.									X	X
Do you have suggestions on how the community can actively engage underserved populations in the planning and decision-making process?			Was listed as 2025 Goal of the City Council.							
Are there local organizations or community members who can act as advocates or liaisons to help communicate emergency information and resources to underserved populations?	CDRN, Life Unlimited, SPICE, Faith-based organizations, Schools		Yes, discussions have begun with community stakeholders							
Access and Functional Needs										
Does your jurisdiction's Local Emergency Operations Plan address provisions for individuals with access and functional needs?	Yes	No	Yes	No	No		Yes	No	Yes	No
If no, when will the plan be updated to include these community members?				Unknown				2025		
How does your jurisdiction currently identify individuals with access and functional needs within the community?										
Access and functional needs are not yet a focus in identification.									X	X
We are exploring methods to identify these individuals.					X		X	X		
We maintain a registry of individuals with specific needs.										
We collaborate with community organizations to identify such individuals.	X		X							
List organization(s)	CDRN, Life Unlimited, Fire Departments		Variety, united way, red cross, Northland Shepard							
To what extent are access and functional needs considered in your jurisdiction's plans?										
Access and functional needs are not explicitly addressed in our plan.					X			X	X	X
We are in the process of developing strategies for these needs.			X							
We consider these needs, but they are not fully integrated.	X									
We have dedicated strategies to address access and functional needs.							X			
List strategies										
How does your jurisdiction engage with organizations that support individuals with access and functional needs in the planning process?										
We have active partnerships with such organizations.			X				X			
We collaborate occasionally, but it is not a consistent practice.								X		
We have not yet engaged with these organizations.					X				X	X
We are considering ways to involve them in the planning process.	X									
Are there specific shelters or facilities designated to accommodate individuals with access and functional needs during emergencies?										
Yes, we have designated accessible shelters and facilities.		X	X				X	X	X	
We consider accessibility but do not have specific facilities.	X									
Accessibility is not a priority in our shelter planning.										X
We are exploring options for accessible shelters.					X					
How does your jurisdiction ensure that emergency communication methods are accessible to individuals with various communication needs?										
We have accessible communication methods established.			X				X			
We consider diverse communication needs but need improvement.	X								X	
Accessibility in communication is not yet well addressed.		X			X			X		X
We are developing plans for accessible communication.										
List methods			Vision and hearing impaired TTD, online translation services							
How does your jurisdiction plan to provide transportation assistance to individuals with mobility challenges during evacuations?										

We have established transportation assistance plans.		X					X			
We consider transportation but need clearer strategies.	X									
Transportation assistance is not yet part of our plans.					X			X	X	X
We are discussing options for transportation assistance.			X							
Does your jurisdiction actively engage individuals with access and functional needs in your planning processes?										
Yes, we involve them as key stakeholders.			X				X			
We involve them to some extent, but improvements are needed.										
We have not yet engaged them in planning discussions.		X			X			X	X	X
We are considering ways to involve them in the process.	X									
How does your jurisdiction plan to ensure that recovery efforts after a disaster prioritize the unique needs of individuals with access and functional needs?										
We have established strategies for inclusive recovery.			X				X			
We consider recovery needs, but more specific plans are needed.	X									
Recovery efforts are not yet focused on these needs.					X			X	X	
We are discussing potential recovery strategies.										X
Other										
Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?	No	No	Yes	No	No	No	No	No	No	No
Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	Yes	No	Yes	No	No	No	Yes	No	Yes	No
Do economic development or redevelopment strategies include provisions for mitigation of natural resources?	Yes	No	Yes	No	No	No	No	No	No	No

Jackson County		Blue Springs	Central Jackson Co FPD	Grain Valley	Grandview	Greenwood	Independence	Jackson County	Kansas City	Lee's Summit	Levasy	Oak Grove	Raytown	Sni Valley FPD
Land Use														
Do the land use policies define an urban services area?		Yes	No	Yes	No		Yes	No	Yes	No	No	No	No	No
Do the land use policies contain provisions for hazard zone identification?		No	No	Yes	No		Yes	No	Yes	Yes	No	No	Yes	No
Do the land use policies discourage development or redevelopment within natural hazard areas?		Yes	No	Yes	Yes		Yes	No	Yes	Yes	No	Yes	Yes	No
Does the future land use map clearly identify natural hazard areas?		Yes	No	Yes	No		Yes	No	Yes	Yes	No	No	Yes	No
Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?		Yes	No	Yes	Yes		Yes	No	Yes	Yes	No	No	No	No
Do the land use policies require storm water engineering studies prior to development?		Yes	No	Yes	Yes		Yes	No	Yes	No	No	No	Yes	No
How does your jurisdiction assess the potential impacts of land use changes on hazard vulnerability and disaster risk?														
We conduct regular assessments of land use patterns and hazards.									X	X			X	
We collaborate with urban planning experts to analyze potential impacts.			X	X			X							
Land use changes are not currently a focus in our hazard assessments.					X						X			
We are exploring methods to integrate land use considerations.		X										X		X
How does your jurisdiction engage with urban planners and land use experts to inform hazard mitigation strategies?														
We regularly collaborate with planners to integrate land use considerations.			X						X	X				
We include urban planners in discussions, but improvements are needed.				X			X							
Urban planning perspectives are not currently integrated into our strategies.		X									X			
We are considering ways to involve urban planners in our planning process.					X									X
Are there specific areas within your jurisdiction that are identified as vulnerable due to recent or anticipated land use changes?														
Yes, we have identified vulnerable areas due to land use changes.										X				
We consider general vulnerability, but specific areas are not defined.				X			X				X			X
Vulnerability due to land use changes is not a current focus.		X			X				X					
We are in the process of assessing vulnerability related to land use.			X											
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to coordinate land use changes for hazard mitigation?														
Yes, we have established regional collaborations for this purpose.									X				X	
We consider regional coordination, but it is not fully integrated.				X			X			X	X			X
Land use coordination is not a significant part of our plans.		X												
We are considering the potential for regional coordination.			X											
How does your jurisdiction plan to communicate land use changes and their potential impact on hazard vulnerability to the public?														
We have comprehensive communication plans for land use changes.									X				X	
We include land use information in our general communication efforts.					X					X				X
Land use communication is not a significant part of our plans.		X		X							X			
We are developing strategies for effective land use communication.			X				X							
Is your jurisdiction actively involved in advocating for sustainable land use practices and policies at higher levels of government?														
Yes, we actively advocate for sustainable land use practices.		X							X					X
We participate in advocacy efforts, but it is not a primary focus.										X				
Sustainable land use advocacy is not a current priority for us.				X							X			
We are considering engagement in land use advocacy.			X				X						X	
Describe any land use measures incorporated into hazard mitigation plan.							We work closely with our Floodplain manager.		Information used to provide overview and drive goals.	The Citys Comprehensive Plan identifies hazard areas for development including flood plains, abandoned gas wells, etc. The Unified Development Ordinance has regulations for development and redevelopment review including subdivision and land development regulation designed to identify and address hazards.			Sec. 50-288 Outlines the provisions for flood hazard mitigation	
Transportation														
Does the transportation plan limit access to hazard areas?		No	No	No	Yes			No	No	Yes	No	No	No	No
Is transportation policy used to guide growth to safe locations?		Yes	No	No	Yes			No	No	Yes	No	No	No	No
Are movement systems designed to function under disaster conditions (e.g., evacuation)?		Yes	Yes	Yes	No			No	No	No	No	No	No	No
Describe any transportation measures incorporated into hazard mitigation plan.									Kansas City does not have a specific transportation plan.	The city adopted a Transportation Level of Service "C". By having a higher level of service, the design of roads within the City normally exceeds the necessary capability to meet normal traffic demand and peak fluctuations in traffic that may be related to incident management, evacuations, detours, etc.				.N/A Not within district authority
Environmental Management														
Are environmental systems that protect development from hazards identified and mapped?		No	No	No	No			No	Yes	Yes	No	No	No	Yes
Do environmental policies maintain and restore protective ecosystems?		No	No	No	No			No	Yes	Yes	No	No	No	Yes
Do environmental policies provide incentives to development located outside protective ecosystems?		No	No	No	No			No	Yes	No	No	No	No	No
On a scale of 1 - 5 how concerned is your jurisdiction about climate change?		2	3	2					5	3	4			1

What are some of your jurisdiction's biggest concerns about climate change?			Heat and cold waves, drought						Flooding, Extreme Heat, Thunderstorms, Tornado, Winter Weather, Community Resiliency	Programs and requirements incorporated into the development review process are designed to improve down stream water quality and other environmental impacts.	More frequent flooding			The chief concern is the lack of agreement among experts on magnitude and specific effects of climate change.
How does your jurisdiction currently assess the potential impacts of climate change on hazards and disaster risks														
We regularly conduct climate vulnerability assessments.									X					X
We consider historical data to estimate future changes.			X							X				
We collaborate with climate experts and research institutions.														
Climate change impacts are not yet integrated into our assessments.		X		X							X			
To what extent does your jurisdiction account for the increased frequency and intensity of climate-related hazards?														
Climate-related hazards are not explicitly addressed in our plan.		X		X							X			
We consider climate change, but it is not a primary focus.			X											
We are in the process of developing strategies for climate-related hazards.														X
We have specific strategies to address climate-related hazards.									X	X				
What are those strategies?									Outlined in Kansas City, Missouri's, Climate Protection and Resiliency Plan 2022	Specific weather related climate events will be addressed in improved city EOP.				First, to gather reliable information
How does your jurisdiction engage with climate science and data to inform hazard mitigation strategies?														
We regularly update our strategies based on the latest climate data.									X					
We incorporate climate projections into long-term planning.										X				X
Climate science has a minimal impact on our mitigation plans.		X									X			
We are still exploring how to incorporate climate data effectively.			X	X										
How does your jurisdiction plan to integrate climate adaptation measures into its hazard mitigation strategies?														
We have clear adaptation measures outlined in our plan.									X	X				
We are considering adaptation, but it is not fully integrated yet.														
Climate adaptation is not yet addressed in our strategies.		X		X							X			
We are currently exploring options for climate adaptation.			X											X
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to address shared climate-related hazards?														
Yes, we have established regional collaborations for this purpose.									X	X				
We consider regional collaboration but have limited initiatives.			X	X										X
Climate-related collaboration is not a current focus.		X									X			
We are considering the potential for regional collaboration.														
How does your jurisdiction plan to communicate climate-related risks and adaptation strategies to the public and stakeholders?														
We have comprehensive communication plans for climate risks.									X					
We include climate information in our general communication efforts.			X											X
Climate communication is not a significant part of our plans.		X		X							X			
We are developing strategies for effective climate communication.										X				
Is your jurisdiction actively involved in advocacy for climate change mitigation policies at higher levels of government?														
Yes, we actively advocate for climate mitigation policies.														X
We participate in advocacy efforts, but it is not a primary focus.									X					
Climate advocacy is not a current priority for us.		X		X							X			
We are considering engagement in climate advocacy.										X				
Describe any environmental management measures incorporated into hazard mitigation plan.														Relevant components of the Kansas City, MO, Local Emergency Operations Plan and the 2022 Climate Protection and Resiliency Plan are incorporated.
Public Safety														
Are the goals and policies of the comprehensive plan related to those of the HMP?		No	Yes	No	No			No	Yes	Yes	No	No	Yes	No
Is safety explicitly included in the plan's growth and development policies?		No	Yes	No	No			No	Yes	Yes	No	No	No	Yes
Does the monitoring and implementation section of the plan cover safe growth objectives?		No	No	No	No			No	Yes	No	No	No	No	No
Describe any public safety measures incorporated into hazard mitigation plan.									Information used to determine goals.	Public Safety sales tax being utilized to grow public to meet the growth of increased city population. All city development processes look at hazard mitigation through land use, identification of hazards, and to access emergency response and evacuation.				
Building Codes														
Does the building code contain provisions to elevate construction to withstand hazard forces?		Yes	Yes	Yes	Yes			No	Yes	No	Yes	No	Yes	No
Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?		Yes	Yes	Yes	Yes			No	Yes	Yes	No	No	Yes	No
Does the building code contain safe room or storm shelter requirements?		Yes	No	Yes	Yes			No	Yes	Yes	No	No	No	No
Describe any building code measures incorporated into hazard mitigation plan.									Information used to determine goals and projects.	ICC 500 design of storm shelters utilized in conjunction with International Building Codes (IBC) 2018. Will be upgrading to 2024 version of ICC codes.	We only have the Flood Plain Management rules from FEMA as a guide.			Available building codes and the hazard mitigation plan are not yet in synchronization due to ongoing update process of updating building codes.

Zoning Ordinances														
Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?		Yes	No	Yes	Yes			No	Yes	Yes	No	No	Yes	No
Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?		Yes	No	Yes	No			No	Yes	Yes	No	No	No	No
Does the zoning ordinance contain mitigation performance standards?		Yes	No	Yes	No			No	Yes	No	No	No	No	No
Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?		Yes	No	Yes	Yes			No	Yes	Yes	No	No	Yes	No
Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?		Yes	No	Yes	Yes			No	Yes	Yes	No	No	Yes	No
Describe any zoning ordinance measures incorporated into hazard mitigation plan.									Information used to determine goals.	The Unified development Ordinance(UDO) has regulations for development and redevelopment review including subdivision and land development regulations designed to address hazards such as flood plains, storm runoff, erosion control, etc. The City encourages "best practice" techniques including the use of pervious pavement, and bio swales where possible to slow erosion and preserve natural features.				.N/A Not within district authority
Subdivision Regulations														
Do the subdivision regulations contain an adopted hazard disclosure?		Yes	No	Yes	No			No	No	Yes	No	No	No	No
Do subdivision regulations contain a provision for soil report evaluations?		Yes	No	Yes	Yes			No	No	No	No	No	No	No
Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?		Yes	No	Yes	Yes			No	No	Yes	No	No	No	No
Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?		Yes	No	No	Yes			No	No	Yes	No	No	No	No
Do the regulations allow density transfers where hazards exist?		Yes	No	No	No			No	No	Yes	No	No	No	No
Describe any subdivision regulation measures incorporated into hazard mitigation plan.									n/a					.N/A Not within district authority
Capital Improvement Program and Infrastructure Policies														
Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?		No	No	No	No			No	Yes	Yes	No	No	No	No
Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?		No	No	No	Yes			No	Yes	Yes	No	No	No	No
Does the capital improvement program provide funding for hazard mitigation projects?		No	No	No	Yes			No	Yes	Yes	No	No	Yes	Yes
Describe any capital improvement program and infrastructure policy measures incorporated into hazard mitigation plan.									Public Works collaborates closely with the Planning Department and Water Department to discourage development in areas vulnerable to natural hazards, namely flooding. All three departments review development plans from private developers to prevent development within floodways and flood plains. Public Works also actively develops infrastructure projects to mitigate stormwater runoff.	The City's Comprehensive plan identifies certain hazard areas for development including flood plain, steep slopes. In order for permitting to occur within a flood plain no adverse impact has to be proven through engineering analysis.				Not applicable due to differing time scale. Hazard mitigation plan measures are necessarily incorporated into capital improvement plan.
Underserved Populations														
How does your jurisdiction identify and define underserved populations for the purpose of hazard mitigation planning?														
We rely on census data and demographics.					X								X	X
We conduct community assessments and consultations.														
We use a combination of data sources and community input.			X						X	X				
We have not explicitly defined underserved populations.		X		X							X			
What steps has your jurisdiction taken to assess the specific vulnerabilities and challenges faced by underserved populations during hazards and disasters?														
We have not yet focused on this aspect of vulnerability assessment.		X		X							X		X	X
We have conducted vulnerability assessments targeting these populations.														
We have analyzed historical disaster impacts on different groups.										X				
We have engaged with community organizations to gather insights.			X						X					
List community organization(s):														
How does your jurisdiction plan to ensure equitable access to hazard information, evacuation plans, and emergency resources for all community members, including underserved populations?									Hope Faith, Greater Kansas City to End Homelessness, Care Beyond the Boulevard, Heartland Center for Behavioral Change, ShelterKC, Jerusalem Farms, Artist Helping for Homeless, etc.	Faith based organizations within community. Lee's Summit Social Services	Mayor and Board of Aldermen	Ministerial Alliance, Community Services League		
We use a variety of communication channels and languages.										X				
We work with community leaders to disseminate information.														
We have plans for accessible formats and resources.			X									X		
We are still developing strategies for inclusive communication.		X		X					X		X		X	X

How does your jurisdiction intend to involve representatives from underserved populations in the hazard mitigation planning process?														
We have established advisory groups with diverse community members.														
We regularly hold public meetings to gather input.														
We collaborate with community-based organizations.									X					
We are exploring ways to improve community engagement.			X	X						X	X	X		X
Are there plans to collaborate with local community organizations, NGOs, or advocacy groups that have expertise in working with underserved populations during hazards and disasters?														
Yes, we have established partnerships and collaborations.									X	X		X		
We are considering such collaborations for future efforts.			X											X
We have not actively explored these partnerships yet.				X							X		X	
No, we do not plan to collaborate with external organizations.														
How does your jurisdiction plan to address financial barriers that might prevent underserved populations from accessing essential resources during emergencies?														
We have plans to provide subsidies or financial support.														
We are working on ways to ensure resource equity.			X						X	X		X		X
Financial barriers are not a focus of our plans.														
We have not yet considered financial barriers.				X							X		X	
Does your jurisdiction plan to review and update its plan to reflect changes in the vulnerabilities and needs of underserved populations over time?														
Yes, we have a scheduled review process that includes this aspect.									X					
We plan to incorporate changes if they are significant.			X							X		X		X
We have not yet considered regular updates for this purpose.				X							X		X	
No, we do not plan to review or update the plan.														
Do you have suggestions on how the community can actively engage underserved populations in the planning and decision-making process?									Kansas City partners with and supports established organizations adept at providing for underserved populations	External stakeholder engagement on community resouce needs.		No suggestions		
Are there local organizations or community members who can act as advocates or liaisons to help communicate emergency information and resources to underserved populations?									Yes	Faith Based collaboratives in place.		Yes, Ministerial Alliance, Community Services League		Undetermined at this time.
Access and Functional Needs														
Does your jurisdiction's Local Emergency Operations Plan address provisions for individuals with access and functional needs?		No	Yes	Yes	No			No	Yes	No	No	Yes	Yes	Yes
If no, when will the plan be updated to include these community members?										2025	Not in the near future			The LEOP is updated as resources and methods become available
How does your jurisdiction currently identify individuals with access and functional needs within the community?														
Access and functional needs are not yet a focus in identification.											X		X	
We are exploring methods to identify these individuals.			X											X
We maintain a registry of individuals with specific needs.									X			X		
We collaborate with community organizations to identify such individuals.				X						X				
List organization(s)				CJC						Faith based and social organizations	none	Ministerial Alliance, Community Services League,		Minisiterial Alliance, Community Services League,
To what extent are access and functional needs considered in your jurisdiction's plans?														
Access and functional needs are not explicitly addressed in our plan.											X			
We are in the process of developing strategies for these needs.										X		X		
We consider these needs, but they are not fully integrated.			X	X									X	X
We have dedicated strategies to address access and functional needs.									X					
List strategies														
How does your jurisdiction engage with organizations that support individuals with access and functional needs in the planning process?									Fire dispatch maintains a database. Housing utilizes direct assistance, community outreach, and other strategy tools.	Communications in order to make sure important hazard information is being passed to include LSAWARE				
We have active partnerships with such organizations.									X					
We collaborate occasionally, but it is not a consistent practice.			X											
We have not yet engaged with these organizations.				X							X	X	X	
We are considering ways to involve them in the planning process.										X				X
Are there specific shelters or facilities designated to accommodate individuals with access and functional needs during emergencies?														
Yes, we have designated accessible shelters and facilities.			X	X					X	X				X
We consider accessibility but do not have specific facilities.												X	X	
Accessibility is not a priority in our shelter planning.											X			
We are exploring options for accessible shelters.														
How does your jurisdiction ensure that emergency communication methods are accessible to individuals with various communication needs?														
We have accessible communication methods established.														
We consider diverse communication needs but need improvement.			X						X	X		X		X
Accessibility in communication is not yet well addressed.				X										
We are developing plans for accessible communication.											X		X	
List methods									Utilization of interpreters including ASL, encourage signing up for AlertKC to receive messages, collaboration with local media and civic leaders, etc.	LSAWARE, Social Media			Nixle, social media, broadcast media	Mixture of audible signals, text based, tactile, language translations
How does your jurisdiction plan to provide transportation assistance to individuals with mobility challenges during evacuations?														
We have established transportation assistance plans.									X					
We consider transportation but need clearer strategies.			X									X	X	X
Transportation assistance is not yet part of our plans.				X							X			
We are discussing options for transportation assistance.										X				
Does your jurisdiction actively engage individuals with access and functional needs in your planning processes?														

Yes, we involve them as key stakeholders.									X					
We involve them to some extent, but improvements are needed.			X											X
We have not yet engaged them in planning discussions.				X							X		X	
We are considering ways to involve them in the process.										X		X		
How does your jurisdiction plan to ensure that recovery efforts after a disaster prioritize the unique needs of individuals with access and functional needs?														
We have established strategies for inclusive recovery.												X		
We consider recovery needs, but more specific plans are needed.			X	X					X	X			X	X
Recovery efforts are not yet focused on these needs.											X			
We are discussing potential recovery strategies.														
Other														
Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?		Yes	No	No	No			No	Yes	Yes	No	Yes	No	Yes
Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?		Yes	Yes	No	No			No	Yes	No	No	Yes	No	Yes
Do economic development or redevelopment strategies include provisions for mitigation of natural resources?		No	No	No	Yes			No	Yes	Yes	No	Yes	No	Yes

Platte County		Farley	Lake Waukomis	Northland Region Ambul	Northmoor	Parkville	Platte City	Platte County	Weston	Platte Woods	Riverside	Tracy	Weatherby Lake
Land Use													
Do the land use policies define an urban services area?		No	No	No	No	Yes	No	Yes	No	Yes	No		No
Do the land use policies contain provisions for hazard zone identification?		No	Yes	No	No	Yes	No	Yes	No	Yes	No		No
Do the land use policies discourage development or redevelopment within natural hazard areas?		No	Yes	No	No	Yes	No	Yes	Yes	Yes	No		No
Does the future land use map clearly identify natural hazard areas?		No	No	No	No	Yes	No	Yes	No	No	No		No
Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?		No	No	No	No	Yes	Yes	Yes	Yes	No	No		No
Do the land use policies require storm water engineering studies prior to development?		No	No	No	No	Yes	Yes	Yes	No	Yes	No		Yes
How does your jurisdiction assess the potential impacts of land use changes on hazard vulnerability and disaster risk?													
We conduct regular assessments of land use patterns and hazards.													X
We collaborate with urban planning experts to analyze potential impacts.						X		X			X		
Land use changes are not currently a focus in our hazard assessments.			X						X				
We are exploring methods to integrate land use considerations.													
How does your jurisdiction engage with urban planners and land use experts to inform hazard mitigation strategies?													
We regularly collaborate with planners to integrate land use considerations.													
We include urban planners in discussions, but improvements are needed.						X		X					
Urban planning perspectives are not currently integrated into our strategies.			X						X				
We are considering ways to involve urban planners in our planning process.													X
Are there specific areas within your jurisdiction that are identified as vulnerable due to recent or anticipated land use changes?													
Yes, we have identified vulnerable areas due to land use changes.						X							
We consider general vulnerability, but specific areas are not defined.								X					X
Vulnerability due to land use changes is not a current focus.			X						X				
We are in the process of assessing vulnerability related to land use.													
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to coordinate land use changes for hazard mitigation?													
Yes, we have established regional collaborations for this purpose.						X							
We consider regional coordination, but it is not fully integrated.								X					
Land use coordination is not a significant part of our plans.			X						X				X
We are considering the potential for regional coordination.													
How does your jurisdiction plan to communicate land use changes and their potential impact on hazard vulnerability to the public?													
We have comprehensive communication plans for land use changes.						X							
We include land use information in our general communication efforts.								X					X
Land use communication is not a significant part of our plans.			X						X				
We are developing strategies for effective land use communication.													
Is your jurisdiction actively involved in advocating for sustainable land use practices and policies at higher levels of government?													
Yes, we actively advocate for sustainable land use practices.						X							
We participate in advocacy efforts, but it is not a primary focus.								X					
Sustainable land use advocacy is not a current priority for us.			X						X				X
We are considering engagement in land use advocacy.													
Describe any land use measures incorporated into hazard mitigation plan.						Follow Hazard Mitigation guidelines plan review. Regulate what is built in the flood plan.		Future Land Use Maps overlay flood hazard areas.					The city does not have any natural hazard areas within the city limits.
Transportation													
Does the transportation plan limit access to hazard areas?		No	No	No	No	No	Yes	Yes	No	No	No		No
Is transportation policy used to guide growth to safe locations?		No	No	No	No	No	Yes	Yes	No	No	No		No
Are movement systems designed to function under disaster conditions (e.g., evacuation)?		No	No	No	No	No	No	Yes	No	No	No		No
Describe any transportation measures incorporated into hazard mitigation plan.								Roadway planning looks at land use plans. All roadways and stormwater plans meet APWA standards					There are no natural hazards within the city limits.
Environmental Management													
Are environmental systems that protect development from hazards identified and mapped?		No	No	No	No	No	No	No	No	No	No		No
Do environmental policies maintain and restore protective ecosystems?		No	No	No	No	No	No	No	No	No	No		No
Do environmental policies provide incentives to development located outside protective ecosystems?		No	No	No	No	No	Yes	No	No	No	No		No
On a scale of 1 - 5 how concerned is your jurisdiction about climate change?			2			4	1	3	1		2		3
What are some of your jurisdiction's biggest concerns about climate change?			evaporation of city lake			Frequency of severe weather events, need to adopt International Energy Conservation Code		flooding, farming, drought, heatwaves.	Impact of severe storms, flooding, drought		Impact of more severe storm systems		The city leaders have explored and discussed issues pertaining to this subject.
How does your jurisdiction currently assess the potential impacts of climate change on hazards and disaster risks													
We regularly conduct climate vulnerability assessments.													
We consider historical data to estimate future changes.								X					X
We collaborate with climate experts and research institutions.						X							
Climate change impacts are not yet integrated into our assessments.			X						X				
To what extent does your jurisdiction account for the increased frequency and intensity of climate-related hazards?													
Climate-related hazards are not explicitly addressed in our plan.			X						X				X
We consider climate change, but it is not a primary focus.						X		X					
We are in the process of developing strategies for climate-related hazards.													
We have specific strategies to address climate-related hazards.													
What are those strategies?								We follow APWA standards which incoporate changes in runoff.					N/A
How does your jurisdiction engage with climate science and data to inform hazard mitigation strategies?													
We regularly update our strategies based on the latest climate data.													
We regularly update our strategies based on the latest climate data.													
We incorporate climate projections into long-term planning.													
Climate science has a minimal impact on our mitigation plans.			X										X
We are still exploring how to incorporate climate data effectively.						X		X	X				
How does your jurisdiction plan to integrate climate adaptation measures into its hazard mitigation strategies?													
We have clear adaptation measures outlined in our plan.													
We are considering adaptation, but it is not fully integrated yet.													
Climate adaptation is not yet addressed in our strategies.			X										X
We are currently exploring options for climate adaptation.						X		X	X				
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to address shared climate-related hazards?													
Yes, we have established regional collaborations for this purpose.													
We consider regional collaboration but have limited initiatives.						X		X					
Climate-related collaboration is not a current focus.			X						X				X
We are considering the potential for regional collaboration.													
How does your jurisdiction plan to communicate climate-related risks and adaptation strategies to the public and stakeholders?													
We have comprehensive communication plans for climate risks.													
We include climate information in our general communication efforts.						X							X
Climate communication is not a significant part of our plans.			X										
We are developing strategies for effective climate communication.								X	X				
Is your jurisdiction actively involved in advocacy for climate change mitigation policies at hiather levels of government?													
Yes, we actively advocate for climate mitigation policies.													
We participate in advocacy efforts, but it is not a primary focus.								X					
Climate advocacy is not a current priority for us.			X						X				X
We are considering engagement in climate advocacy.						X							
Describe any environmental management measures incorporated into hazard mitigation plan.								We focus on ordinance changes, for example, the energy code and stream setbacks.					N/A
Public Safety													
Are the goals and policies of the comprehensive plan related to those of the HMP?		No	No	No	No	Yes	No	Yes	No	No	Yes		Yes
Is safety explicitly included in the plan's growth and development policies?		No	No	No	Yes	No	No	Yes	No	No	Yes		Yes
Does the monitoring and implementation section of the plan cover safe growth objectives?		No	No	No	Yes	No	No	Yes	No	No	Yes		Yes
Describe any public safety measures incorporated into hazard mitigation plan.								We are Life, Safety, and Property Preservation and assist in evacuations, traffic, and crowd control.					Through education and updates to the general public.
Building Codes													
Does the building code contain provisions to elevate construction to withstand hazard forces?		No	No	No	Yes	No	No	Yes	Yes	No	Yes		Yes
Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?		No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes		Yes
Does the building code contain safe room or storm shelter requirements?		No	No	No	No	Yes	No	No	No	No	No		No
Describe any building code measures incorporated into hazard mitigation plan.						Per 2018 IBC during plan review and inspections.							The city uses building codes and works with contractors to insure compliance. At this time safe rooms are not a requirement for the city.
Zoning Ordinances													
Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?		No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes		No
Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?		No	Yes	No	No	No	No	No	No	No	No		No
Does the zoning ordinance contain mitigation performance standards?		No	Yes	No	No	No	Yes	No	No	No	No		No
Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?		No	No	No	No	Yes	Yes	Yes	No	No	Yes		No
Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?		No	No	No	No	No	Yes	Yes	Yes	No	Yes		No
Describe any zoning ordinance measures incorporated into hazard mitigation plan.						Code incorporates NFIP FEMA regulations pertaining to flood plains.		Flood Ordinance and stream buffer setbacks					The city does not have any high level hazard areas that are affected within the city limits.
Subdivision Regulations													
Do the subdivision regulations contain an adopted hazard disclosure?		No	No	No	No	No	Yes	Yes	Yes	No	No		No
Do subdivision regulations contain a provision for soil report evaluations?		No	No	No	No	Yes	Yes	Yes	No	No	Yes		No
Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?		No	No	No	No	Yes	Yes	Yes	No	No	No		No
Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?		No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes
Do the regulations allow density transfers where hazards exist?		No	No	No	No	No	No	No	No	No	Yes		No
Describe any subdivision regulation measures incorporated into hazard mitigation plan.						Title IV of the City Municipal code							The city has certain area set aside for green space in the areas being developed.
Capital Improvement Program and Infrastructure Policies													
Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?		No	No	No	No	No	Yes	Yes	No	No	No		No
Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?		No	No	No	No	No	Yes	Yes	No	No	No		No
Does the capital improvement program provide funding for hazard mitigation projects?		No	No	No	No	Yes	Yes	Yes	No	No	Yes		No
Describe any capital improvement program and infrastructure policy measures incorporated into hazard mitigation plan.						Flood prevention and control. Stream bank improvements.							N/A
Underserved Populations													
How does your jurisdiction identify and define underserved populations for the purpose of hazard mitigation planning?													
We rely on census data and demographics.								X					
We conduct community assessments and consultations.													
We use a combination of data sources and community input.													
We have not explicitly defined underserved populations.			X			X			X	X			X
What steps has your jurisdiction taken to assess the specific vulnerabilities and challenges faced by underserved populations during hazards and disasters?													
We have not yet focused on this aspect of vulnerability assessment.			X			X			X	X			X
We have conducted vulnerability assessments targeting these populations.													
We have analyzed historical disaster impacts on different groups.													
We have engaged with community organizations to gather insights.								X					

List community organization(s):								Senior Services, CDHN, Senior Fund					City Aldermen City Emerekency Manasement
How does your jurisdiction plan to ensure equitable access to hazard information, evacuation plans, and emergency resources for all community members, including underserved populations?													
We use a variety of communication channels and languages.											X		
We work with community leaders to disseminate information.						X							
We have plans for accessible formats and resources.			X										X
We are still developing strategies for inclusive communication.								X	X				
How does your jurisdiction intend to involve representatives from underserved populations in the hazard mitigation planning process?													
We have established advisory groups with diverse community members.													
We regularly hold public meetings to gather input.													
We collaborate with community-based organizations.								X	X				X
We are exploring ways to improve community engagement.			X			X					X		
Are there plans to collaborate with local community organizations, NGOs, or advocacy groups that have expertise in working with underserved populations during hazards and disasters?													
Yes, we have established partnerships and collaborations.								X					
We are considering such collaborations for future efforts.						X							
We have not actively explored these partnerships yet.			X						X				X
No, we do not plan to collaborate with external organizations.													
How does your jurisdiction plan to address financial barriers that might prevent underserved populations from accessing essential resources during emergencies?													
We have plans to provide subsidies or financial support.													
We are working on ways to ensure resource equity.						X		X					
Financial barriers are not a focus of our plans.													X
We have not yet considered financial barriers.			X						X		X		
Does your jurisdiction plan to review and update its plan to reflect changes in the vulnerabilities and needs of underserved populations over time?													
Yes, we have a scheduled review process that includes this aspect.								X					
We plan to incorporate changes if they are significant.													X
We have not yet considered regular updates for this purpose.						X					X		
No, we do not plan to review or update the plan.			X										
Do you have suggestions on how the community can actively engage underserved populations in the planning and decision-making process?						All of community is included.		Offer Email invites and will work on one-to-one contact to engage these groups to help us review this plan and future plan updates.					N/A
Are there local organizations or community members who can act as advocates or liaisons to help communicate emergency information and resources to underserved populations?						Yes		Senior services fund, Senior Services and KC Regional COAD					This is a small jurisdiction with a minimal underserved population. The city government officials are always open to public discussion.
Access and Functional Needs													
Does your jurisdiction's Local Emergency Operations Plan address provisions for individuals with access and functional needs?		No	Yes	No	No	Yes	No	Yes	No	Yes	No		No
If no, when will the plan be updated to include these community members?			CCLW has adopted Platte County plan				UNK		unknown		this is a work in progress at this time.		This will be an ongoing issue.
How does your jurisdiction currently identify individuals with access and functional needs within the community?													
Access and functional needs are not yet a focus in identification.			X										X
We are exploring methods to identify these individuals.									X		X		
We maintain a registry of individuals with specific needs.													
We collaborate with community organizations to identify such individuals.						X	X	X					
List organization(s)						Health Department, Senior living center	Local Churches	Senior Services, Senior Services Fund, Oates, MARC					
To what extent are access and functional needs considered in your jurisdiction's plans?													
Access and functional needs are not explicitly addressed in our plan.			X				X						X
We are in the process of developing strategies for these needs.											X		
We consider these needs, but they are not fully integrated.						X		X	X				
We have dedicated strategies to address access and functional needs.													
List strategies								Need Further engagement with organizations to address the issues and include them in our plans					
How does your jurisdiction engage with organizations that support individuals with access and functional needs in the planning process?													
We have active partnerships with such organizations.						X		X					
We collaborate occasionally, but it is not a consistent practice.													
We have not yet engaged with these organizations.			X										
We are considering ways to involve them in the planning process.									X		X		X
Are there specific shelters or facilities designated to accommodate individuals with access and functional needs during emergencies?													
Yes, we have designated accessible shelters and facilities.						X		X					
We consider accessibility but do not have specific facilities.													X
Accessibility is not a priority in our shelter planning.			X						X				
We are exploring options for accessible shelters.											X		
How does your jurisdiction ensure that emergency communication methods are accessible to individuals with various communication needs?													
We have accessible communication methods established.								X					X
We consider diverse communication needs but need improvement.						X							
Accessibility in communication is not yet well addressed.			X						X		X		
We are developing plans for accessible communication.													
List methods								News, PIO releases, TextCaster,			Social media at this time.		TextCaster Social Media
How does your jurisdiction plan to provide transportation assistance to individuals with mobility challenges during evacuations?													
We have established transportation assistance plans.						X							
We consider transportation but need clearer strategies.								X					X
Transportation assistance is not yet part of our plans.			X						X		X		
We are discussing options for transportation assistance.													
Does your jurisdiction actively engage individuals with access and functional needs in your planning processes?													
Yes, we involve them as key stakeholders.													
We involve them to some extent, but improvements are needed.								X					
We have not yet engaged them in planning discussions.			X			X			X		X		X
We are considering ways to involve them in the process.													
How does your jurisdiction plan to ensure that recovery efforts after a disaster prioritize the unique needs of individuals with access and functional needs?													
We have established strategies for inclusive recovery.													
We consider recovery needs, but more specific plans are needed.						X					X		
Recovery efforts are not yet focused on these needs.			X										
We are discussing potential recovery strategies.								X	X				X
Other													
Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?		No	No	No	No	Yes	No	Yes	No	No	No		No
Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?		No	Yes	No	No	Yes	No	Yes	No	No	No		No
Do economic development or redevelopment strategies include provisions for mitigation of natural resources?		No	No	No	No	Yes	No	No	No	No	Yes		No

Ray County	Richmond	Ray County
Land Use		
Do the land use policies define an urban services area?	Yes	Yes
Do the land use policies contain provisions for hazard zone identification?	No	Yes
Do the land use policies discourage development or redevelopment within natural hazard areas?	No	No
Does the future land use map clearly identify natural hazard areas?	Yes	Yes
Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	Yes	Yes
Do the land use policies require storm water engineering studies prior to development?	Yes	
How does your jurisdiction assess the potential impacts of land use changes on hazard vulnerability and disaster risk?		
We conduct regular assessments of land use patterns and hazards.		
We collaborate with urban planning experts to analyze potential impacts.		
Land use changes are not currently a focus in our hazard assessments.		
We are exploring methods to integrate land use considerations.		
How does your jurisdiction engage with urban planners and land use experts to inform hazard mitigation strategies?		
We regularly collaborate with planners to integrate land use considerations.		
We include urban planners in discussions, but improvements are needed.		
Urban planning perspectives are not currently integrated into our strategies.		
We are considering ways to involve urban planners in our planning process.		
Are there specific areas within your jurisdiction that are identified as vulnerable due to recent or anticipated land use changes?		
Yes, we have identified vulnerable areas due to land use changes.		
We consider general vulnerability, but specific areas are not defined.		
Vulnerability due to land use changes is not a current focus.		
We are in the process of assessing vulnerability related to land use.		
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to coordinate land use changes for hazard mitigation?		
Yes, we have established regional collaborations for this purpose.		
We consider regional coordination, but it is not fully integrated.		
Land use coordination is not a significant part of our plans.		
We are considering the potential for regional coordination.		
How does your jurisdiction plan to communicate land use changes and their potential impact on hazard vulnerability to the public?		
We have comprehensive communication plans for land use changes.		
We include land use information in our general communication efforts.		
Land use communication is not a significant part of our plans.		
We are developing strategies for effective land use communication.		
Is your jurisdiction actively involved in advocating for sustainable land use practices and policies at higher levels of government?		
Yes, we actively advocate for sustainable land use practices.		
We participate in advocacy efforts, but it is not a primary focus.		
Sustainable land use advocacy is not a current priority for us.		
We are considering engagement in land use advocacy.		
Describe any land use measures incorporated into hazard mitigation plan.		
Transportation		
Does the transportation plan limit access to hazard areas?	No	
Is transportation policy used to guide growth to safe locations?	No	
Are movement systems designed to function under disaster conditions (e.g., evacuation)?	No	
Describe any transportation measures incorporated into hazard mitigation plan.		
Environmental Management		

Are environmental systems that protect development from hazards identified and mapped?	No	No
Do environmental policies maintain and restore protective ecosystems?	No	No
Do environmental policies provide incentives to development located outside protective ecosystems?	No	No
On a scale of 1 - 5 how concerned is your jurisdiction about climate change?	1	
What are some of your jurisdiction's biggest concerns about climate change?		
How does your jurisdiction currently assess the potential impacts of climate change on hazards and disaster risks		
We regularly conduct climate vulnerability assessments.		
We consider historical data to estimate future changes.		
We collaborate with climate experts and research institutions.		
Climate change impacts are not yet integrated into our assessments.	X	
To what extent does your jurisdiction account for the increased frequency and intensity of climate-related hazards?		
Climate-related hazards are not explicitly addressed in our plan.		
We consider climate change, but it is not a primary focus.		
We are in the process of developing strategies for climate-related hazards.	X	
We have specific strategies to address climate-related hazards.		
What are those strategies?		
How does your jurisdiction engage with climate science and data to inform hazard mitigation strategies?		
We regularly update our strategies based on the latest climate data.		
We incorporate climate projections into long-term planning.		
Climate science has a minimal impact on our mitigation plans.		
We are still exploring how to incorporate climate data effectively.		
How does your jurisdiction plan to integrate climate adaptation measures into its hazard mitigation strategies?		
We have clear adaptation measures outlined in our plan.		
We are considering adaptation, but it is not fully integrated yet.		
Climate adaptation is not yet addressed in our strategies.		
We are currently exploring options for climate adaptation.		
Does your jurisdiction collaborate with neighboring jurisdictions or regional entities to address shared climate-related hazards?		
Yes, we have established regional collaborations for this purpose.		
We consider regional collaboration but have limited initiatives.		
Climate-related collaboration is not a current focus.		
We are considering the potential for regional collaboration.		
How does your jurisdiction plan to communicate climate-related risks and adaptation strategies to the public and stakeholders?		
We have comprehensive communication plans for climate risks.		
We include climate information in our general communication efforts.		
Climate communication is not a significant part of our plans.		
We are developing strategies for effective climate communication.		
Is your jurisdiction actively involved in advocacy for climate change mitigation policies at higher levels of government?		
Yes, we actively advocate for climate mitigation policies.		
We participate in advocacy efforts, but it is not a primary focus.		
Climate advocacy is not a current priority for us.		
We are considering engagement in climate advocacy.		
Describe any environmental management measures incorporated into hazard mitigation plan.		
Public Safety		
Are the goals and policies of the comprehensive plan related to those of the HMP?	No	
Is safety explicitly included in the plan's growth and development policies?	Yes	

Does the monitoring and implementation section of the plan cover safe growth objectives?	No	
Describe any public safety measures incorporated into hazard mitigation plan.		
Building Codes		
Does the building code contain provisions to elevate construction to withstand hazard forces?	Yes	
Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?	Yes	
Does the building code contain safe room or storm shelter requirements?	Yes	
Describe any building code measures incorporated into hazard mitigation plan.		
Zoning Ordinances		
Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	Yes	
Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?	No	
Does the zoning ordinance contain mitigation performance standards?	No	
Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	Yes	
Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	Yes	
Describe any zoning ordinance measures incorporated into hazard mitigation plan.		
Subdivision Regulations		
Do the subdivision regulations contain an adopted hazard disclosure?	Yes	
Do subdivision regulations contain a provision for soil report evaluations?	Yes	
Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	Yes	
Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	Yes	
Do the regulations allow density transfers where hazards exist?	No	
Describe any subdivision regulation measures incorporated into hazard mitigation plan.		
Capital Improvement Program and Infrastructure Policies		
Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	No	
Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	No	
Does the capital improvement program provide funding for hazard mitigation projects?	No	
Describe any capital improvement program and infrastructure policy measures incorporated into hazard mitigation plan.		
Underserved Populations		
How does your jurisdiction identify and define underserved populations for the purpose of hazard mitigation planning?		
We rely on census data and demographics.	X	
We conduct community assessments and consultations.		
We use a combination of data sources and community input.		
We have not explicitly defined underserved populations.		
What steps has your jurisdiction taken to assess the specific vulnerabilities and challenges faced by underserved populations during hazards and disasters?		
We have not yet focused on this aspect of vulnerability assessment.	X	
We have conducted vulnerability assessments targeting these populations.		
We have analyzed historical disaster impacts on different groups.		
We have engaged with community organizations to gather insights.		
List community organization(s):		

How does your jurisdiction plan to ensure equitable access to hazard information, evacuation plans, and emergency resources for all community members, including underserved populations?		
We use a variety of communication channels and languages.		
We work with community leaders to disseminate information.		
We have plans for accessible formats and resources.		
We are still developing strategies for inclusive communication.	X	
How does your jurisdiction intend to involve representatives from underserved populations in the hazard mitigation planning process?		
We have established advisory groups with diverse community members.		
We regularly hold public meetings to gather input.		
We collaborate with community-based organizations.		
We are exploring ways to improve community engagement.	X	
Are there plans to collaborate with local community organizations, NGOs, or advocacy groups that have expertise in working with underserved populations during hazards and disasters?		
Yes, we have established partnerships and collaborations.		
We are considering such collaborations for future efforts.		
We have not actively explored these partnerships yet.		
No, we do not plan to collaborate with external organizations.	X	
How does your jurisdiction plan to address financial barriers that might prevent underserved populations from accessing essential resources during emergencies?		
We have plans to provide subsidies or financial support.		
We are working on ways to ensure resource equity.		
Financial barriers are not a focus of our plans.	X	
We have not yet considered financial barriers.		
Does your jurisdiction plan to review and update its plan to reflect changes in the vulnerabilities and needs of underserved populations over time?		
Yes, we have a scheduled review process that includes this aspect.		
We plan to incorporate changes if they are significant.	X	
We have not yet considered regular updates for this purpose.		
No, we do not plan to review or update the plan.		
Do you have suggestions on how the community can actively engage underserved populations in the planning and decision-making process?		
Are there local organizations or community members who can act as advocates or liaisons to help communicate emergency information and resources to underserved populations?	Yes	
Access and Functional Needs		
Does your jurisdiction's Local Emergency Operations Plan address provisions for individuals with access and functional needs?	Yes	
If no, when will the plan be updated to include these community members?		
How does your jurisdiction currently identify individuals with access and functional needs within the community?		
Access and functional needs are not yet a focus in identification.		
We are exploring methods to identify these individuals.	X	
We maintain a registry of individuals with specific needs.		
We collaborate with community organizations to identify such individuals.		
List organization(s)		
To what extent are access and functional needs considered in your jurisdiction's plans?		
Access and functional needs are not explicitly addressed in our plan.	X	
We are in the process of developing strategies for these needs.		
We consider these needs, but they are not fully integrated.		
We have dedicated strategies to address access and functional needs.		
List strategies		

How does your jurisdiction engage with organizations that support individuals with access and functional needs in the planning process?		
We have active partnerships with such organizations.	X	
We collaborate occasionally, but it is not a consistent practice.		
We have not yet engaged with these organizations.		
We are considering ways to involve them in the planning process.		
Are there specific shelters or facilities designated to accommodate individuals with access and functional needs during emergencies?		
Yes, we have designated accessible shelters and facilities.	X	
We consider accessibility but do not have specific facilities.		
Accessibility is not a priority in our shelter planning.		
We are exploring options for accessible shelters.		
How does your jurisdiction ensure that emergency communication methods are accessible to individuals with various communication needs?		
We have accessible communication methods established.		
We consider diverse communication needs but need improvement.		
Accessibility in communication is not yet well addressed.	X	
We are developing plans for accessible communication.		
List methods		
How does your jurisdiction plan to provide transportation assistance to individuals with mobility challenges during evacuations?		
We have established transportation assistance plans.	X	
We consider transportation but need clearer strategies.		
Transportation assistance is not yet part of our plans.		
We are discussing options for transportation assistance.		
Does your jurisdiction actively engage individuals with access and functional needs in your planning processes?		
Yes, we involve them as key stakeholders.		
We involve them to some extent, but improvements are needed.		
We have not yet engaged them in planning discussions.	X	
We are considering ways to involve them in the process.		
How does your jurisdiction plan to ensure that recovery efforts after a disaster prioritize the unique needs of individuals with access and functional needs?		
We have established strategies for inclusive recovery.		
We consider recovery needs, but more specific plans are needed.		
Recovery efforts are not yet focused on these needs.	X	
We are discussing potential recovery strategies.		
Other		
Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?	No	
Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	No	
Do economic development or redevelopment strategies include provisions for mitigation of natural resources?	No	

Chapter 4: Hazard Identification and Risk Assessment

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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.*

4.1 Overview and Changes from 2020 Plan

For the 2025 Plan Update, the Planning Team continued to focus on five natural hazards in the region. The selected hazards are consolidated into five main categories: tornadoes, severe thunderstorms, severe winter weather, heat, and flooding. The heat category includes a profile on drought and heat waves. The flooding category includes a profile on flooding, levee failures, and dam failures. Focusing the Plan on natural disasters was done to narrow each jurisdiction's focus and simplify the selection of, and implementation for, mitigation efforts. The identification of these priority natural hazards was made by the project steering committee and was informed by a survey of jurisdiction representatives and the public.

Each hazard profile includes:

- **Description**
- **Historical Occurrences**
- **Probable Location**
    - Magnitude
- **Impact**
- **Probability of Future Occurrence**
- **Extent**
    - Probable Duration
- **Vulnerability Analysis**
- **Problem Statements**

Each profile may differ slightly due to the characteristics of the hazard.

The areas that may be affected by weather-related natural hazards are very difficult to identify. Where possible, the locations or geographic areas that may be affected are mapped. Tornadoes, for example, may affect any part of the Kansas City metropolitan area. Severe thunderstorms, severe winter weather, drought, and heat waves are usually widespread weather events that affect parts of the region or the entire region. In the *Probable Locations* section of each hazard profile, a magnitude rating was given to the five-county area estimating the percent of a county that could be affected during a hazard event. The methodology is explained in ***Section 4.2***.

Certain locations — because of specific characteristics of the built environment, socio-economic conditions or a combination of these elements — may be more susceptible to these natural hazards. The Vulnerability Analysis in **Section 4.5** highlights these areas and populations.

Many sources were researched for data and information relating to hazards in the Kansas City metropolitan area. Principal sources of all-hazard information include FEMA and SEMA. The National Climate Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS) were primary sources of information and statistics on weather and/or climate-related hazards.

Hazard-specific databases were also researched for this Plan. For instance, the National Drought Mitigation Center at University Nebraska Lincoln was used for the drought profile. The primary sources of information on dams and dam safety were the Missouri Department of Natural Resources (MDNR) Dam Safety Division and the U.S. Army Corps of Engineers' (USACE) National Inventory of Dams (NID). The primary source for information on levees was the National Levee Database.

Other sources of information include MARC Research Services Department; city and county Web sites and officials; existing county, regional and state plans, reports and documents; newspaper and news organization Web sites, articles and accounts of natural disasters; other state and federal agencies, such as the U.S. Census Bureau and Missouri Census Data Center (MCDC); and colleges and universities, especially the University of Missouri and University of Missouri Extension. References are noted at the end of each hazard profile with a bibliography of research sources.

Several data deficiencies noted in the 2020 Plan have been corrected or new sources of information identified. These are noted where applicable.

4.1.1 Hazards Not Included and Reasons for Elimination

While the Plan was consolidated to only include natural hazards, there are two natural hazards that were removed from the Plan. Wildland fires and earthquakes are not included in this Plan due to low probabilities. In the 2015 Plan, earthquakes rated 'low' in all modified Mercalli levels for future probable severity. The maximum percentage of any portion of any county affected by wildfires, was 7.5 percent. The majority of every county in the planning area was 0%-1% affected by wildland fires.

All man-made hazards were removed from this Plan to help jurisdictions narrow their mitigation efforts. The following hazards may be of concern to one or more local jurisdictions but were not included in the 2020 plan: emerging infectious disease, transboundary animal disease, hazardous materials incidents, mass transportation accidents, cyber disruption, public mass shooter incidents, civil disorder, and terrorism.

4.2 Community-Driven Risk Assessment

As part of the 2025 Plan Community Profile Survey, each jurisdiction was asked to reassess its risks for the natural hazards identified in the Plan. "Cascading hazards," those hazards resulting from a natural disaster, were listed to be considered when reassessing risk. **Table 4.1** shows the relationship between the region's identified disasters and categories of possible cascading hazards. Any of these cascading hazards alone or in combination with the direct adverse effects of a disaster can potentially impact emergency response operations in affected communities.

Table 4.1: Cascading Hazards Resulting from Disasters

Natural Disaster	Power and Communications Interruption	Water Supply Interruption	Business Interruption	Computer Failure and/or Loss of Records	Transportation Interruption	Health and/or Environmental Hazards
Tornado	X	X	X	X	X	X
Severe Thunderstorms	X		X	X		
Severe Winter Weather	X	X	X	X	X	X
Drought		X	X			X
Heat Wave		X	X			X
Flood	X	X	X	X	X	X
Levee Failure	X	X	X	X	X	X
Dam Failure	X	X	X	X	X	X

X = 50 percent or greater chance of cascading effect resulting from disaster

As each county noted the risk each hazard poses to their governance, hazards were re-prioritized or deleted. If a hazard was not of concern, the jurisdiction was asked to describe why it was eliminated. Risk is "the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets."[i]

4.3 Hazard Identification

Requirement §201.6(c)(2)(i): *[The risk assessment shall include a] description of the type, 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.*

Description of the eight sections describing each hazard:

- **Description** section explains the hazard.
- **Historical Occurrences** section offers a description of all hazard events occurring in the region.
- **Probable Location** section describes the geographic areas that may be affected. Along with the magnitude, or percent, of the county that can be affected during a hazard event.
- **Impact** section describes the effects a hazard can have on property and people.

- **Probability of Future Occurrence** section describes the likelihood of a hazard occurring in the future.
- **Extent** section describes classification methods and advisories commonly used to describe the severity of a hazard.
    - **Probable Duration** subsection describes the hazard duration and the potential speed of onset.
- **Vulnerability Analysis** section describes areas and populations in the region that are most susceptible to the hazard.
- **Problem Statements** section outlines concerns and vulnerabilities identified by jurisdictions in relation to the hazard.

Tables 4.3 through 4.8 contain a summary analysis of the identified priority hazards that could potentially affect Cass, Clay, Jackson, Platte, and Ray counties. The summaries include values for magnitude, impact, and probability of future occurrence. The metrics in the summary tables differ from the previous plan due to the omission of the statistical risk assessment. Now, the values are shown as unique, county percentages instead of 'high, medium, or low' rankings. Each hazard is profiled in detail starting in Section 4.6.

4.4 Hazard Analysis Summary and Calculations

Magnitude is the potential percentage range of the land area of the county that can be affected by a hazard. The ranking was given to the counties based on the characteristics of the hazard. Magnitude is ranked on a scale of four levels:

1. Less than 10 percent
2. 10 to 25 percent
3. 25 to 50 percent
4. More than 50 percent

Impact includes the damage totals (crop and property), injuries, and deaths of historical occurrences, where applicable.

Probability of Future Occurrence is the percent chance that the hazard will occur in a given year. Variables used to calculate the probability are listed in the summary charts. Many hazards have events occurring more than once a year. The total events are noted in the chart, however only the number of years with one or more events were used to find the probability. For example, 40 tornadoes have struck Cass County over the past 73 years. However, in the 73 years there were only 29 years experiencing one or more tornado events. Thus, Cass County has a 40 percent chance of having a tornado event in any given year (29 divided by 73 times 100). **Table 4.2** shows the layout of the hazard summary tables.

Table 4.2: Cass County Hazard Summary						
Hazard (period with data on record)	**Magnitude**	**Impact**	**Probability of Future Occurrence**			
			Total Events	**Years with 1+ Events**	**Years with data on record**	**Probability**
Tornadoes (1950-2024)	>50%	Damages: $31.45M Deaths: 3 Injuries: 26	40	29	73	40%

The data contained in **Tables 4.3-4.7** is aggregated for Cass, Clay, Jackson, Platte and Ray counties because every jurisdiction and unincorporated part of each county did not fully participate in this plan. To compensate for data lost due to lack of response, the information below is summarized at the county level to provide a more concise regional assessment. All information was collected from the National Weather Service's NCDC online database. Each hazard is profiled in detail starting in Section 4.6.

Table 4.3: Cass County Hazard Summary						
Hazard (period with data on record)	**Magnitude**	**Impact**	**Probability of Future Occurrence**			
			Total Events	**Years with 1+ Events**	**Years with data on record**	**Probability**
Tornadoes (1950-2024)	>50%[1]	Damages: $31.45M Deaths: 3 Injuries: 26	40	29	73	40%
Severe Thunderstorms (including lightning and hail events) (1955-2024)	10%-25%	Damages: $4.48M Deaths: 1 Injuries: 7	498	62	65	95%
Severe Winter Weather (1996-2024)	>50%	Damages: $7.3M[2] Deaths: 0 Injuries: 0	61	22	28	79%
Heat Wave* (1998-2024)	>50%	Deaths: 2 Injuries: 0	15	7	26	27%
Drought (2000-2024)	>50%	Total Reports: 118[3] Total Impacts: 36[3]	21	6	24	25%
Flooding (1996-2024)	25%-50%	Damages: $728K Deaths: 0 Injuries: 0	68	24	28	86%
Levee Failures	0	Not in the Hazard Area	Not in the Hazard Area	Not in the Hazard Area	Not in the Hazard Area	0%
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

[1] Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, a magnitude of 4 is assigned here to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.

[2] Damage estimates aggregated for all counties affected by winter storms.
[3] Report and Impact data covers 2009-2024 only
*Heat wave data is aggregated for multiple Missouri NWS Forecast Zones affected by heat wave events, which included Cass, Clay, Jackson, Platte and Cass counties. County-specific data is unavailable.

Table 4.4: Clay County Hazard Summary

Hazard (period with data on record)	Magnitude	Impact	Probability of Future Occurrence			
			Total Events	Years with 1+ Events	Years with data on record	Probability
Tornadoes (1950-2024)	>50%[1]	Damages: $114.21M Deaths: 0 Injuries: 30	34	30	73	41%
Severe Thunderstorms (including lightning and hail events) (1955-2024)	10%-25%	Damages: $7.31M Deaths: 0 Injuries: 4	620	65	69	94%
Severe Winter Weather (1996-2024)	>50%	Damages: $272K[2] Deaths: 0 Injuries: 0	49	24	28	86%
Heat Wave* (1998-2024)	>50%	Deaths: 2 Injuries: 0	18	7	26	27%
Drought (2000-2024)	>50%	Total Reports: 108[3] Total Impacts: 32[3]	18	5	24	21%
Flooding (1996-2024)	25%-50%	Damages: $4.82M Deaths: 0 Injuries: 0	125	22	28	79%
Levee Failures	10%-15%	N/A	N/A	N/A	N/A	N/A
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

[1] Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, a magnitude of 4 is assigned here to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.
[2] Damage estimates aggregated for all counties affected by winter storms.
[3] Report and Impact data covers 2009-2024 only
*Heat wave data is aggregated for multiple Missouri NWS Forecast Zones affected by heat wave events, which included Cass, Clay, Jackson, Platte and Cass counties. County-specific data is unavailable.

Table 4.5: Jackson County Hazard Summary						
Hazard (period with data on record)	**Magnitude**	**Impact**	**Probability of Future Occurrence**			
			Total Events	**Years with 1+ Events**	**Years with data on record**	**Probability**
Tornadoes (1950-2024)	>50%[1]	Damages: $11.58M Deaths: 37 Injuries: 193	48	36	73	49%
Severe Thunderstorms (including lightning and hail events) (1955-2024)	10%-25%	Damages: $28.86M Deaths: 1 Injuries: 13	548	67	69	97%
Severe Winter Weather (1996-2024)	>50%	Damages: $17.02M[2] Deaths: 3 Injuries: 0	77	24	28	86%
Heat Wave* (1998-2024)	>50%	Deaths: 48 Injuries: 0	28	12	26	46%
Drought (2000-2024)	>50%	Total Reports: 113[3] Total Impacts: 70[3]	24	6	24	25%
Flooding (1996-2024)	25%-50%	Damages: $22.68M Deaths: 1 Injuries: 0	206	27	28	96%
Levee Failures	10%-15%	N/A	N/A	N/A	N/A	N/A
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

[1] Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, a magnitude of 4 is assigned here to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.

[2] Damage estimates aggregated for all counties affected by winter storms.

[3] Report and Impact data covers 2009-2024 only

*Heat wave data is aggregated for multiple Missouri NWS Forecast Zones affected by heat wave events, which included Cass, Clay, Jackson, Platte and Cass counties. County-specific data is unavailable.

Table 4.6: Platte County Hazard Summary						
Hazard (period with data on record)	**Magnitude**	**Impact**	**Probability of Future Occurrence**			
			Total Events	**Years with 1+ Events**	**Years with data on record**	**Probability**
Tornadoes (1950-2024)	>50%[1]	Damages: $35.61M Deaths: 0 Injuries: 17	19	16	73	22%
Severe Thunderstorms (including lightning and hail events) (1955-2024)	10%-25%	Damages: $2.05M Deaths: 0 Injuries: 1	425	58	69	84%
Severe Winter Weather (1996-2024)	>50%	Damages: $5.272M[2] Deaths: 0 Injuries: 0	64	26	28	93%
Heat Wave (1998-2024)	>50%	Deaths: 1 Injuries: 0	19	7	26	27%
Drought (2000-2024)	>50%	Total Reports: 143[3] Total Impacts: 40[3]	18	5	24	21%
Flooding (1996-2024)	25%-50%	Damages: $45.4M Deaths: 0 Injuries: 0	107	19	28	68%
Levee Failures	10%-15%	N/A	N/A	N/A	N/A	N/A
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

[1] Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, a magnitude of 4 is assigned here to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.

[2] Damage estimates aggregated for all counties affected by winter storms.

[3] Report and Impact data covers 2009-2024 only

*Heat wave data is aggregated for multiple Missouri NWS Forecast Zones affected by heat wave events, which included Cass, Clay, Jackson, Platte and Cass counties. County-specific data is unavailable.

Table 4.7: Ray County Hazard Summary						
Hazard (period with data on record)	**Magnitude**	**Impact**	**Probability of Future Occurrence**			
			Total Events	**Years with 1+ Events**	**Years with data on record**	**Probability**
Tornadoes (1950-2024)	>50%[1]	Damages: $6.45M Deaths: 2 Injuries: 21	33	28	73	38%
Severe Thunderstorms (including lightning and hail events) (1955-2024)	10%-25%	Damages: $1M Deaths: 0 Injuries: 0	172	49	69	71%
Severe Winter Weather (1996-2024)	>50%	Damages: $300K[2] Deaths: 0 Injuries: 0	47	20	28	71%
Heat Wave* (1998-2024)	>50%	Deaths: 0 Injuries: 0	12	6	26	23%
Drought (2000-2024)	>50%	**Total Reports: 100[3] Total Impacts: 27[3]	19	6	24	25%
Flooding (1996-2024)	25%-50%	Damages: $101K Deaths: 1 Injuries: 0	54	16	28	57%
Levee Failures	10%-15%	N/A	N/A	N/A	N/A	N/A
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

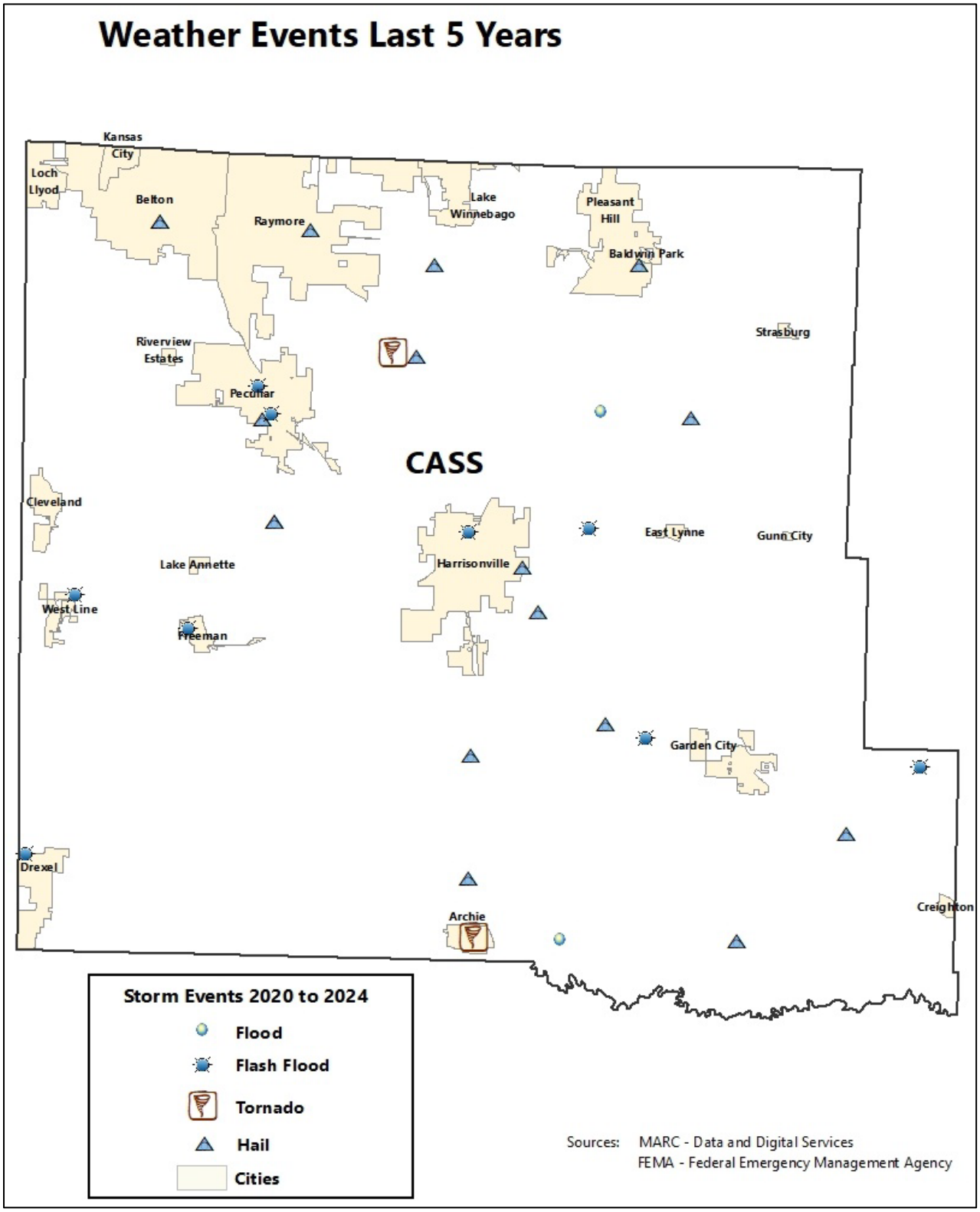
[1] Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, a magnitude of 4 is assigned here to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.

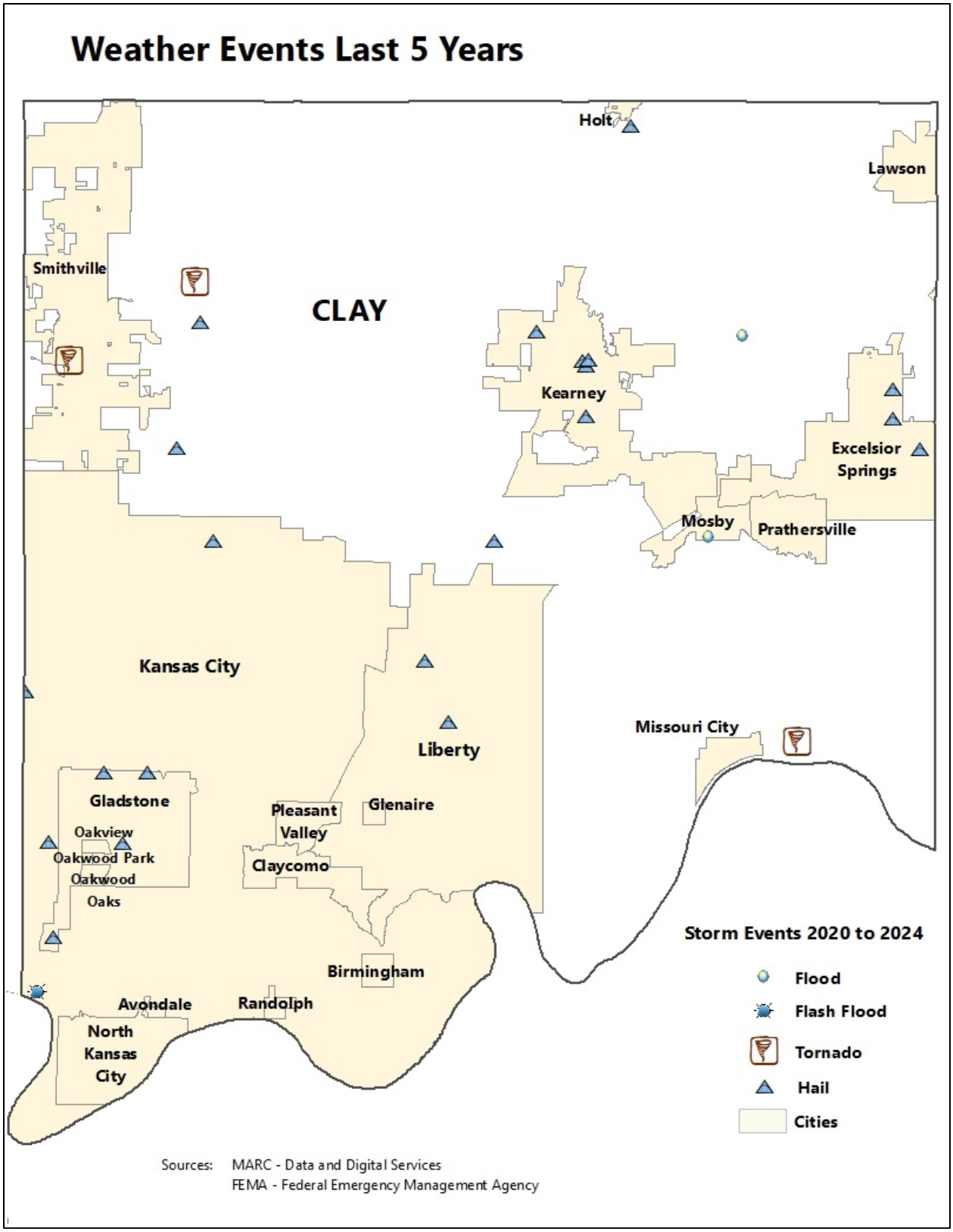
[2] Damage estimates aggregated for all counties affected by winter storms.

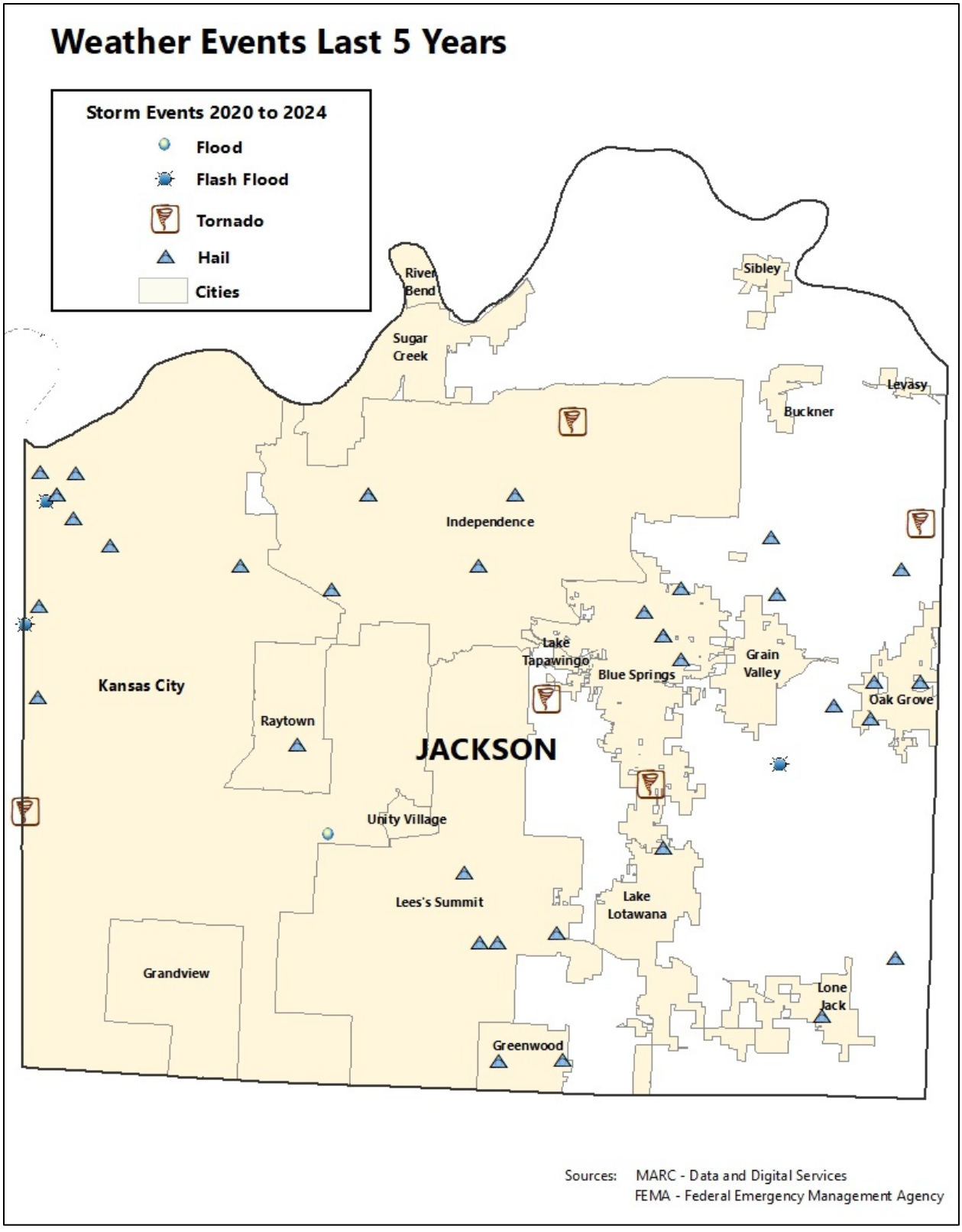
[3] Report and Impact data covers 2009-2024 only

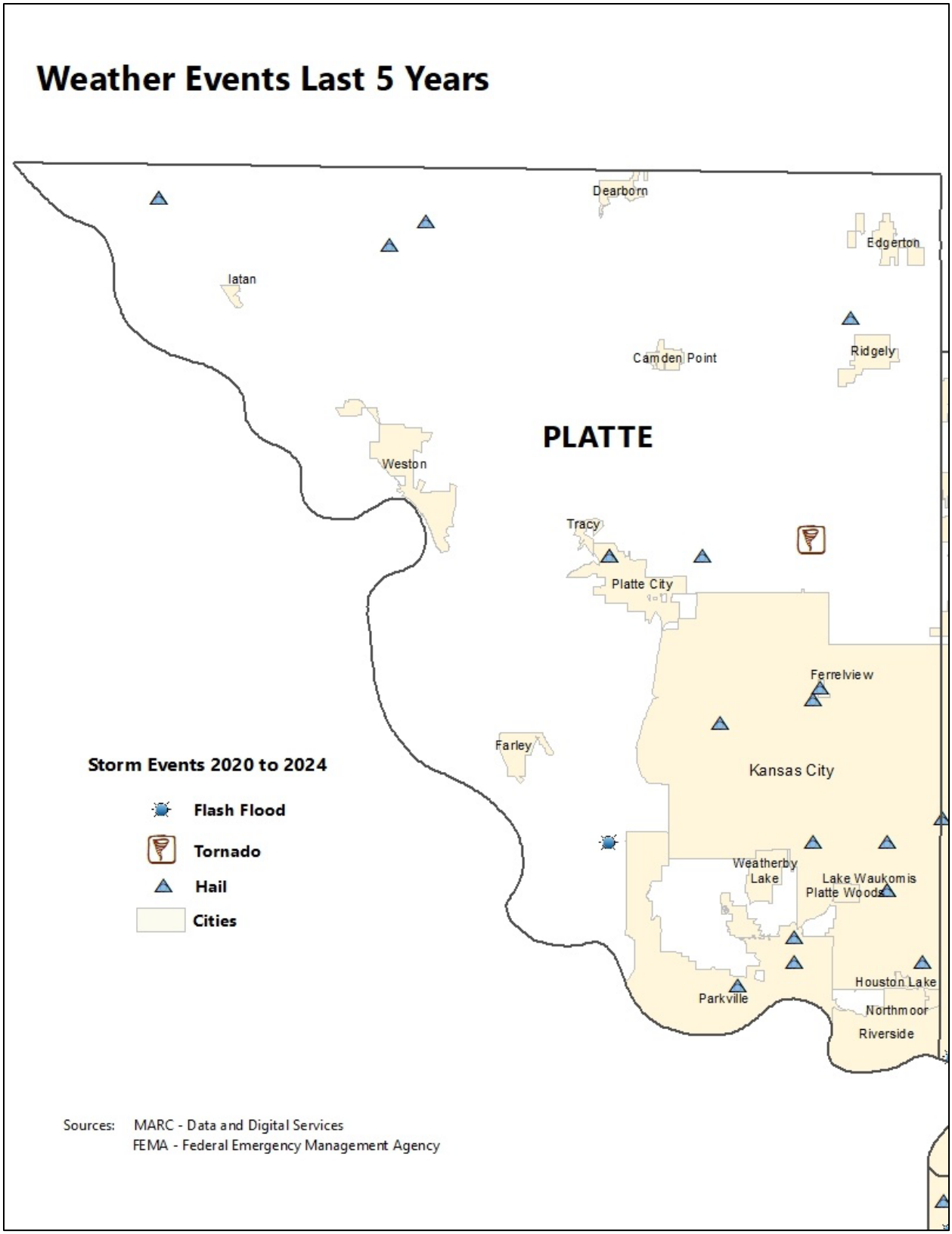
*Heat wave data is aggregated for multiple Missouri NWS Forecast Zones affected by heat wave events, which included Cass, Clay, Jackson, Platte and Cass counties. County-specific data is unavailable.

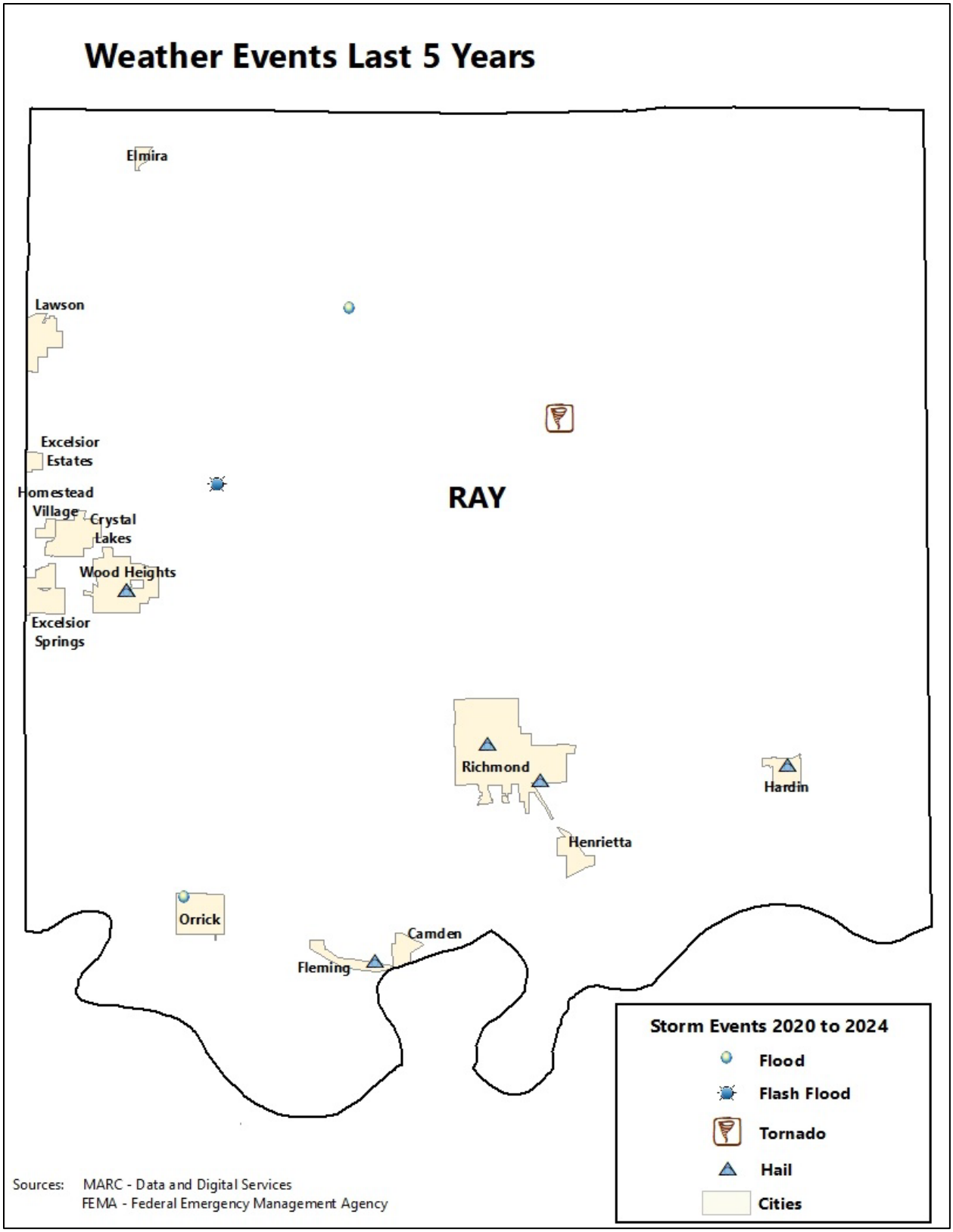
The following maps below illustrate the significant natural hazard events that have occurred over the past 5 years in each of the participating counties.




Weather Events Last 5 Years
Holt
Lawson
Smithville
CLAY
Kearney
Excelsior Springs
Mosby
Prathersville
Kansas City
Liberty
Missouri City
Gladstone
Oakview
Oakwood Park
Oakwood
Oaks
Pleasant Valley
Glenaire
Claycomo
Birmingham
Avondale
Randolph
North Kansas City
Storm Events 2020 to 2024
Flood
Flash Flood
Tornado
Hail
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Weather Events Last 5 Years
Storm Events 2020 to 2024
Flood
Flash Flood
Tornado
Hail
Cities
River Bend
Sugar Creek
Sibley
Levasy
Buckner
Independence
Lake Tapawingo
Blue Springs
Grain Valley
Oak Grove
Kansas City
Raytown
JACKSON
Unity Village
Lees's Summit
Lake Lotawana
Grandview
Lone Jack
Greenwood
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Weather Events Last 5 Years
Dearborn
Edgerton
Iatan
Camden Point
Ridgely
PLATTE
Weston
Tracy
Platte City
Ferrelview
Farley
Kansas City
Storm Events 2020 to 2024
Flash Flood
Tornado
Hail
Cities
Weatherby Lake
Lake Waukomis
Platte Woods
Houston Lake
Parkville
Northmoor
Riverside
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Weather Events Last 5 Years
Elmira
Lawson
Excelsior Estates
Homestead Village
Crystal Lakes
Wood Heights
Excelsior Springs
RAY
Richmond
Hardin
Henrietta
Orrick
Camden
Fleming
Storm Events 2020 to 2024
Flood
Flash Flood
Tornado
Hail
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency

Data limitations:
The NCDC database does not contain information on events prior to 1950, and for some hazards there is no information prior to 1996 or 1998; this relatively short data set lends itself to the possibility of skewed probability of occurrence outcomes. To compensate for this, only the years in which events occurred, and not the total number of events, were factored when determining probability—as demonstrated in the preceding Cass County tornado example. If the total number of events is divided by the years in question, then the possibility exists for achieving a greater than a 100 percent probability of an event occurring. For instance, taking Cass County again, but this time using floods, there have been 54 floods in Cass County since 1996 (the earliest data is available). If these numbers were used to determine probability, then 54 events divided by 28 years equals an over 200 percent probability of a flood event occurring. But, if only the years in which at least one flood occurred are used rather than the total number of floods, then the probability becomes more realistic. In this case, 21 of the 28 years on record had flood events, thus there is a 75 percent probability of at least one flood occurring a year.

Severe winter weather damage estimates are calculated for the total area affected by the storm, which generally includes a group of counties. Therefore, each county's exact loss estimate is unknown. It is likely that damage estimates from each winter storm overlap from county to county. To compensate for this, the total damage costs for all storms that included the selected county are described here to provide a comprehensive understanding of damages from winter storms.

The future probability of occurrence for drought is calculated using historic events but due to the complexity of determining drought conditions the percentage lacks credibility. An additional measure of drought future probability is discussed in ***Section 4.12***.

Where other data limitations exist, they are explained separately in each hazard.

4.5 Vulnerability Assessment

"Vulnerability" describes an asset's level of exposure or susceptibility to damage from natural hazards. The vulnerability of an asset—such as residential and commercial property, critical facilities or infrastructure—depends on a variety of factors, including its construction, contents and/or economic value of its functions. A vulnerability assessment provides policymakers, emergency managers and planners with information on the extent or severity of loss of life, injuries and/or property damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment attempts to combine information related to hazard identification with an inventory of commercial property, residential property, public facilities (including critical facilities) and infrastructure. Information detailed in **Section 2: Regional Profile** was used to approximate value of buildings and infrastructure and identify likely affected populations. Because hazards have different impact areas and characteristics, varying methodologies were used to estimate vulnerability and are described below.

Additionally, the last section of each hazard profile includes a series of *problem statements*, which are statements identified by each county to describe its greatest vulnerabilities to specific hazards and to be addressed in the mitigation strategy. When appropriate, specific jurisdictions are highlighted.

4.5.1 Vulnerability Assessment for "Non-Area Specific" Hazards

Tornadoes, severe thunderstorms, severe winter weather, drought, and heat waves are identified in this Plan and are best characterized as "non-area specific" hazards, meaning the hazard is not confined to a defined geographic area and has an equal chance of occurring (and impacting) any given portion of the planning area versus another. This presents serious challenges when attempting to describe a jurisdiction's vulnerability in realistic terms, as the totality of its assets could be considered vulnerable and offers little definitive guidance as to where jurisdictions should direct limited resources for mitigation efforts.

The vulnerability analysis for non-area specific hazards remain broad estimates when outlining areas and population that could be most affected in a hazard event. Each profile includes different information based on the specific hazard. The Vulnerability Analysis section will include one or more of the following topics:

- **Critical Facility** information in the form of maps or tables.
- **Vulnerable Population** information in the form of maps or graphs.
- **Vulnerable Asset** descriptions including population, structures, and other community assets determined to have value and susceptible to damage and loss from hazard events.

4.5.2 Vulnerability Assessment for "Area Specific" Hazards

The three remaining hazards – flooding, levee failure, and dam failure are considered "area specific" hazards, in that they have generally known geographic boundaries and can impact specific portions of the planning area. Because more is known about these hazards, detailed loss estimates can be conducted for each. For flooding, HAZUS-MH was used to calculate potential losses by jurisdiction (see flooding hazard profile for more information). For levee failures, building parcel data was overlaid on a GIS layer for areas protected by levees to estimate the potential loss of buildings within the protected area by impacted jurisdiction (see levee failure hazard profile). For dam failure, jurisdictions and buildings in wildland/urban interface areas susceptible to fire were identified and mapped. These vulnerability assessments estimate losses to people, buildings and infrastructure potentially at risk from hazards in each county.

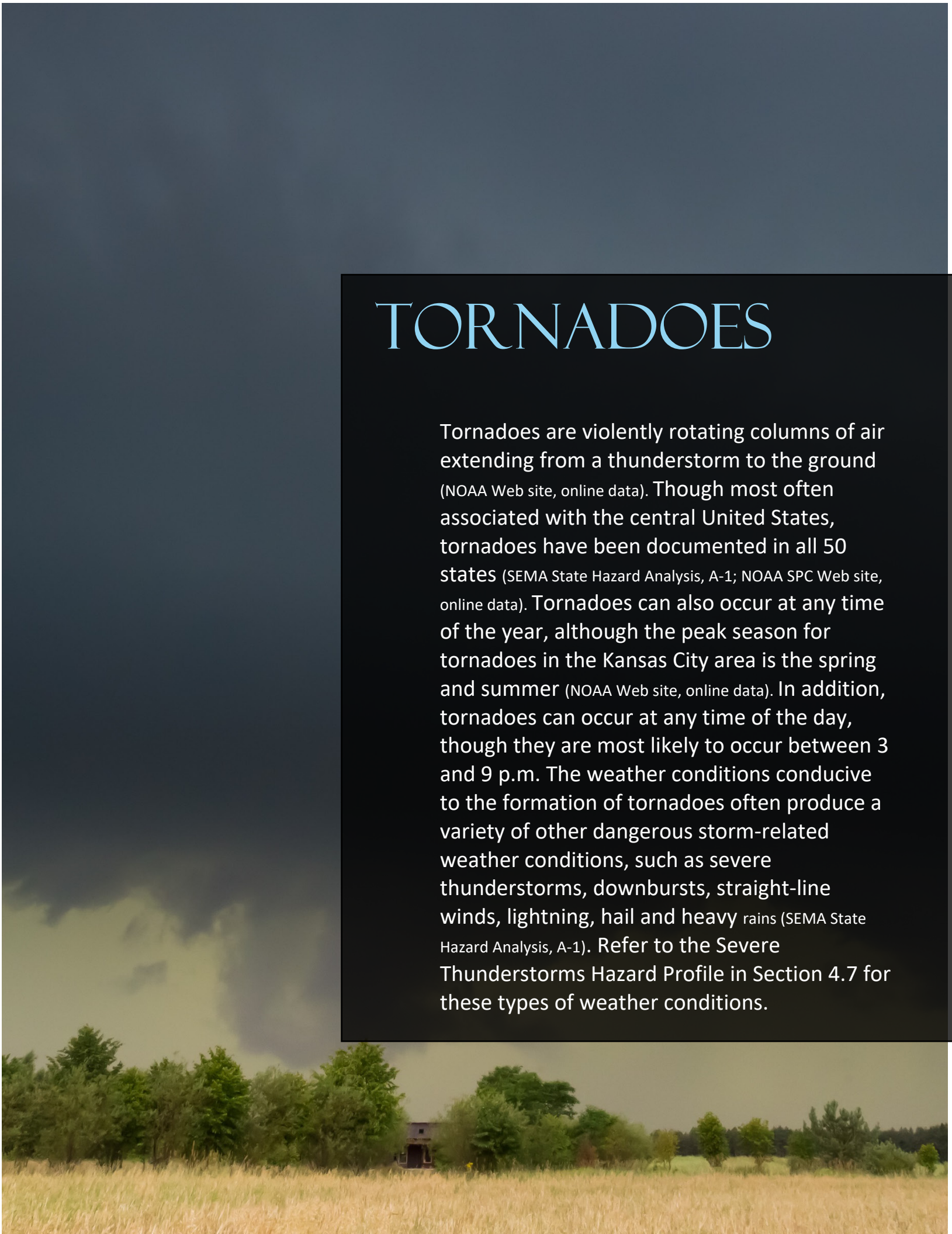
Building and income loss:

- **Potential Impacts** identified as consequences or effects on a community and its vulnerable assets
- **Loss Estimates** based on a jurisdiction's building stock or other hazard-specific disaster impacts

Attachments

Attachment 4-1: Summary Assessment of Risks (Cass, Clay, Jackson, Platte & Ray Counties and Kansas City)

[i] FEMA *Local Mitigation Planning Handbook,* May 2023



TORNADOES

Tornadoes are violently rotating columns of air extending from a thunderstorm to the ground (NOAA Web site, online data). Though most often associated with the central United States, tornadoes have been documented in all 50 states (SEMA State Hazard Analysis, A-1; NOAA SPC Web site, online data). Tornadoes can also occur at any time of the year, although the peak season for tornadoes in the Kansas City area is the spring and summer (NOAA Web site, online data). In addition, tornadoes can occur at any time of the day, though they are most likely to occur between 3 and 9 p.m. The weather conditions conducive to the formation of tornadoes often produce a variety of other dangerous storm-related weather conditions, such as severe thunderstorms, downbursts, straight-line winds, lightning, hail and heavy rains (SEMA State Hazard Analysis, A-1). Refer to the Severe Thunderstorms Hazard Profile in Section 4.7 for these types of weather conditions.

4.6 Tornadoes

Tornadoes are formed from the largest thunderstorms, and the most destructive tornadoes are formed by "supercells," which are, according to NOAA's Storm Prediction Center (SPC), "rotating thunderstorms with a well-defined radar circulation called a mesocyclone."[i] SEMA Hazard Analysis provides a vivid description of the formation of a tornado:

> [The] cumulonimbus clouds [in a thunderstorm] can reach heights of up to 55,000 feet above ground level, and are commonly formed when warm, 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. Adding to all this is the deflection of the earth's surface, and the air masses will 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.[ii]

The average period of a tornado's ground contact is 30 minutes, covering an average distance of 15 miles a review of Missouri tornadoes occurring between 1950 and 1996, the National Weather Service calculated a mean path length of 2.27 miles and a mean path area of 0.14 square miles.[iii]

The damage associated with tornadoes is primarily caused by wind speed; in general, the greater the wind speed, the greater the potential for damage. The violently rotating winds of a tornado can break branches and uproot trees, tear roofs off houses, lift vehicles off the ground, remove walls from houses and topple well-constructed homes and other structures. In addition, a large amount of debris can be generated by a tornado's destructive winds and objects can become "missiles," indirectly damaging structures and injuring or killing people through the force of their impact.

Tornadoes are classified according to the Enhanced Fujita Tornado Damage Scale, commonly referred to as the EF-Scale. The Enhanced Fujita scale, which became standard in 2007, replaced the replaced Fujita scale.[iv] The NWS is the only federal agency with authority to provide 'official' tornado EF Scale ratings. The National Weather Service explains, "the goal is to assign an EF Scale category based on the highest wind speed that occurred within the damage path. First, trained NWS personnel will identify the appropriate damage indicator (DI) [see list below] from more than one of the 28 used in rating the damage. The construction or description of a building should match the DI being considered, and the observed damage should match one of the 8 degrees of damage (DOD) used by the scale. The tornado evaluator will then make a judgment within the range of upper and lower bound wind speeds, as to whether the wind speed to cause the damage is higher or lower than the expected value for the particular DOD. This is done for several structures not just one, before a final EF rating is determined."[v] **(See Table 4.6.1)**

Table 4.6.1 below compares the F-scale to the EF-scale:

Table 4.6.1 Enhanced Fujita Scale			
Derived EF Scale		**Operation EF Scale**	
EF Number	**Three-Second Gust (mph)**	**EF Number**	**Three-Second Gust (mph)**
0	65-85	0	65-85
1	86-109	1	86-110
2	110-137	2	111-135
3	138-167	3	136-165
4	168-199	4	166-200
5	200-234	5	Over 200

Source: NOAA Web site, online data

4.6.1

Historical Occurrences

According to the National Climatic Data Center (NCDC), the Kansas City area has been struck by 160 tornadoes of varying degrees of intensity since January 1, 1950.[vi] These tornadoes in Cass, Clay, Jackson, Platte and Ray counties have caused 42 deaths and 289 injuries. Most notably, the Ruskin Heights Tornado of May 20, 1957, was the deadliest and most destructive tornado to ever strike the Kansas City metro area. The track of this F5 tornado was 71 miles long and averaged 400 yards wide.[vii] This massive tornado was responsible for 44 deaths in the bistate Kansas City area, including 37 people killed in Jackson County alone and 531 injuries.[viii] Damages were estimated at $40 million. When adjusted for inflation (in 1997 dollars), the damage from this tornado was $228 million, making it the14th most damaging tornado in US history.[ix] The current costliest tornado on record, according to NOAA, is the EF5 tornado devastating Joplin, Mo. on May 22, 2011, with estimated $2.8 billion in damage (2011 dollars).[x]

Data Limitation: One limitation to this data is that many tornadoes that might have occurred in uninhabited areas, as well as some inhabited areas, have not been reported. NOAA Storm Data and the Storm Events Database report tornadoes in segments.[xi] Event data may show that a tornado contains multiple segments if it crosses a county or state line. Also, tornadoes that lift off the ground in less than five minutes or 2.5 miles are considered separate tornadoes. The NOAA data for tornadoes is adjusted for inflation and other economic effects.

Table 4.6.2 below lists the number of tornadoes by EF-Scale rating in Cass, Clay, Jackson, Platte and Ray counties. No additional deaths caused by tornadoes have occurred since the last plan update; however, 12 injuries occurred in Tarsney Lakes in Jackson County on March 6, 2017, due to an EF3 tornado.

Table 4.6.2: Kansas City Area Tornadoes by EF-Scale (1950-2018)						
EF-Scale	**Cass**	**Clay**	**Jackson**	**Platte**	**Ray**	**Total**
F0	20	9	17	4	9	**59**
F1	11	12	10	4	11	**48**
F2	2	6	7	2	8	**25**
F3	5	2	4	4	2	**17**
F4	0	3	1	4	2	**10**
F5	0	0	1	0	0	**1**
Total	**38**	**32**	**40**	**18**	**32**	**160**

Source: NOAA Web site, online data

Table 4.6.3 provides the locations, dates, magnitude, number of deaths, number of injuries, property damage and crop damage for tornadoes occurring in Cass, Clay, Jackson, Platte and Ray counties between January 1, 2015, and December 31, 2018. The data for these tables is from the storm event database on the NCDC Web site.[xii] A total of 18 tornado events since the last plan update occurred on eight specific dates in March, May, June, July, September, and October: May 16, 2015; July 1, 2015; September 18, 2015; March 6, 2017; June 26, 2018; July 6, 2017; May 2, 2018; and October 9, 2018.

Table 4.6.3: Kansas City Area Tornadoes (2015-2018)

County	Location	Date	Magnitude	Deaths	Injuries	Property Damage*	Crop Damage*
CASS	GOWDY	7/1/2015	EF0	0	0	$0	$0
CASS	WEST LINE	9/18/2015	EF1	0	0	$0	$0
CASS	HARRISONVILLE ARPT	9/18/2015	EF0	0	0	$0	$0
CASS	BELTON	5/2/2018	EF0	0	0	$0	$0
CLAY	GLENAIRE	7/6/2015	EF0	0	0	$0	$0
CLAY	SMITHVILLE	3/6/2017	EF2	0	0	$0	$0
JACKSON	BUCKNER	5/16/2015	EF1	0	0	$0	$0
JACKSON	UNITY VLG	7/1/2015	EF1	0	0	$0	$0
JACKSON	LAKE LOTAWANA	7/1/2015	EF0	0	0	$0	$0
JACKSON	VALE	3/6/2017	EF0	0	0	$0	$0
JACKSON	TARSNEY LAKES	3/6/2017	EF3	0	12	$0	$0
JACKSON	DODSON	5/2/2018	EF0	0	0	$0	$0
JACKSON	RAYTOWN	5/2/2018	EF0	0	0	$0	$0
JACKSON	LAKE LOTAWANA	6/26/2018	EF0	0	0	$150,000	$0
RAY	LAWSON	5/16/2015	EF0	0	0	$0	$0
RAY	ORRICK	5/16/2015	EF2	0	0	$0	$0
RAY	TAITSVILLE	5/16/2015	EF1	0	0	$0	$0
RAY	KNOXVILLE	10/9/2018	EF0	0	0	$0	$0

Source: NOAA NCDC Web site

*the dollar values assigned in storm data are a basic estimate

Table 4.6.4 provides the locations, dates, magnitude, number of deaths, number of injuries, property damage and crop damage for tornadoes occurring in Cass, Clay, Jackson, Platte and Ray counties between May 2019 and November 2024. The data for this table is from the storm event database on the NCDC Web site.

Table 4.6.4: Kansas City Area Tornadoes (2019- November 2024)

County	Location	Date	Magnitude	Deaths	Injuries	Property Damage*	Crop Damage*
Cass	ARCHIE	06/04/2020	EF0	0	0	$0	$0
Cass	PECULIAR ARPT	03/15/2021	EF0	0	0	$0	$0
Clay	MOSBY	05/28/2019	EF2	0	0	$0	$0
Clay	SMITHVILLE	07/29/2020	EF0	0	0	$0	$0
Clay	MISSOURI CITY	06/11/2021	EF0	0	0	$0	$0
Clay	PARADISE	04/16/2024	EF1	0	0	$0	$0
Jackson	VALE	05/24/2019	EF0	0	0	$0	$0
Jackson	COCKRELL	05/24/2019	EF0	0	0	$0	$0
Jackson	COCKRELL	09/22/2019	EF0	0	0	$0	$0
Jackson	LAKE TAPAWINGO	06/04/2020	EF0	0	0	$0	$0
Jackson	RED BRIDGE	06/08/2022	EF1	0	0	$0	$0
Jackson	RIPLEY	06/08/2022	EF2	0	0	$0	$0
Jackson	BLUE SPGS	05/06/2024	EF1	0	0	$0	$0
Jackson	LEVASY	05/06/2024	EF0	0	0	$0	$0
Platte	HOOVER	05/06/2024	EF0	0	0	$0	$0
Ray	MILLVILLE	08/04/2023	EF0	0	0	$0	$0

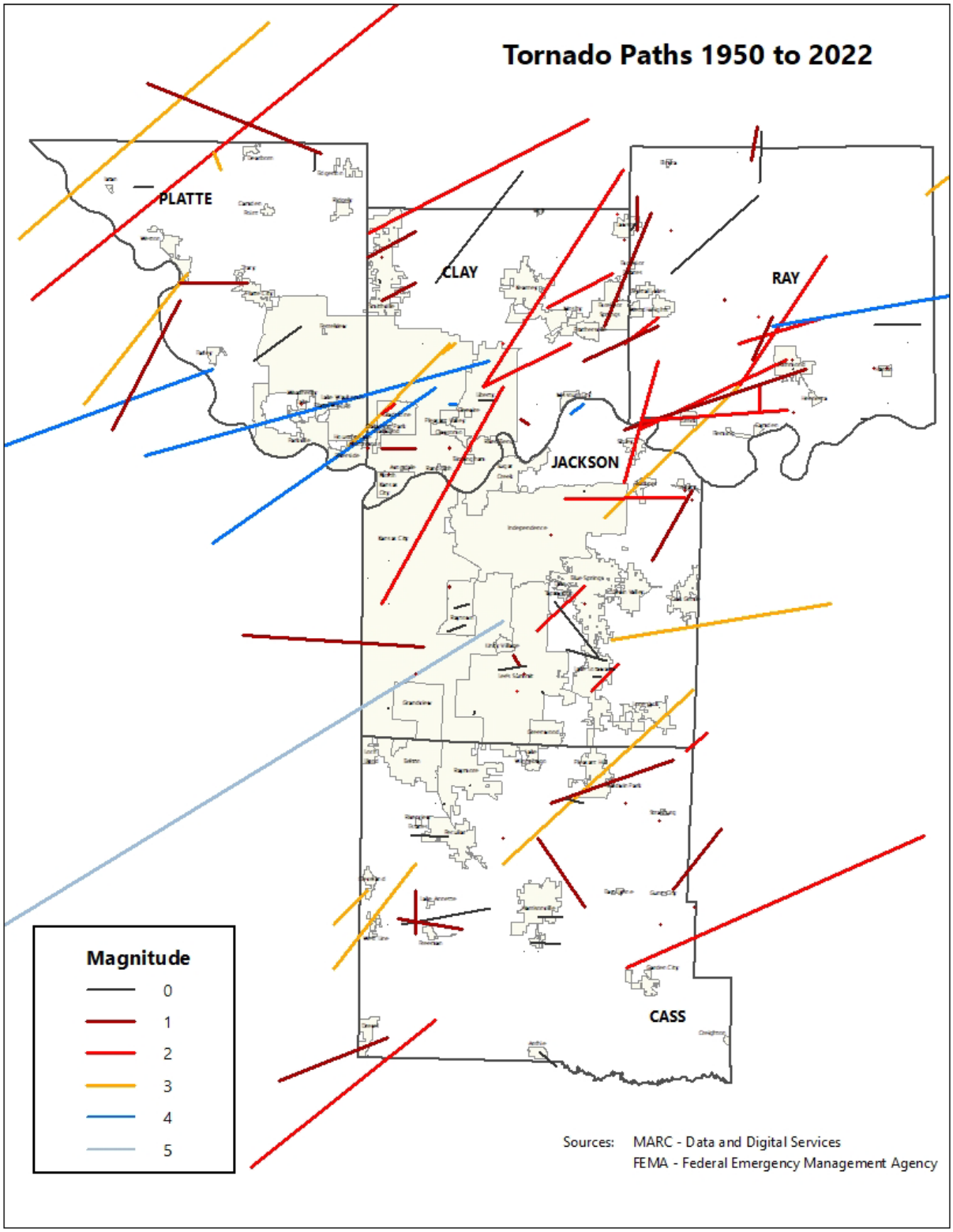
Source: NOAA NCDC Web site

*the dollar values assigned in storm data are a basic estimate

Map 4.6.1 illustrates the history of tornadoes hitting in and around the Kansas City region since 1996. The figure presents paths of destruction.

Historical narratives of the region's prior deadly tornadoes prior to 2010 are available in the 2010 Plan update. Narratives were removed from the 2015 Plan update as well as the 2020 Plan update to

streamline information. The 2020 Plan update and 2025 Plan update focus on events occurring in the last five years or those in the recent past that give context to the region's vulnerability and demonstrate potential impact to the region.

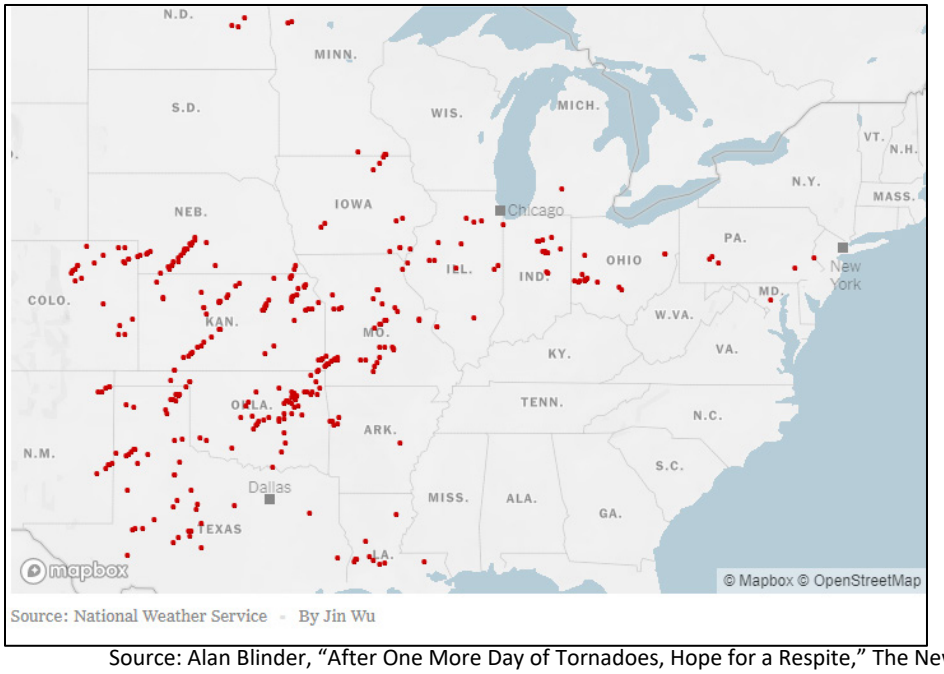


Map 4.6.1 Kansas City Metropolitan Area Tornadoes 1996-2019)

4.6.1a Tornado Outbreak of May 2019

A major tornado outbreak occurred across the central region of the United States during the month of May 2019. Damage was reported in multiple Midwest states as well as states outside the Midwest. As of June 2019, tornado events from 2019 are not logged in the NOAA Storm Events Database. Information from a New York Times article called, "After One More Day of Tornadoes, Hope for a Respite," cited The National Weather Service saying:

> "Powered by a high-pressure system in the South and a trough that hung atop the West, the burst of storms pushed the United States to a total of 38 tornado-linked deaths so far this year, the highest count since 2014. Wednesday was the 13th consecutive day when the National Oceanic and Atmospheric Administration received at least eight preliminary reports of tornadoes.
>
> And of the roughly 300 tornado or severe thunderstorm watches that forecasters have issued this year [2019], more than 40 percent have come since May 17, when this pernicious round of bad weather began."



Source: Alan Blinder, "After One More Day of Tornadoes, Hope for a Respite," The New York Times[xiii]

Map 4.6.2: Locations of Tornadoes Reported from May 17-29, 2019

While damage to the planning area was not as severe as the last tornado outbreak of May 4, 2003, Cass, Clay, Jackson, Platte, and Ray counties were in or close to many catastrophic tornado events. This was the second major tornado outbreak in the Kansas City area in the past 10 years. The only other recorded outbreak happened in 1977.

Jackson County, MO – June 8, 2022

Strong to Severe thunderstorms across Kansas and Missouri the evening of June 7th, 2022, continued to evolve into a complex of strong to severe thunderstorms as they moved into the Kansas City Metro area between 12:30 and 1 AM CDT. These storms resulted in numerous reports of wind damage across the region as well as four confirmed tornadoes, one through the southern side of the Kansas City Metro, one

in northeastern Jackson County Missouri and two near Louisburg, KS. The tornado developed within a larger bowing line segment of thunderstorms moving across the region. In addition to the tornado, a large swath of wind damage was noted south of the tornado track. In this area, downed tree limbs and other indicators were noted to be blown in the same west to east direction.

Clay County, MO – May 28, 2019 [xiv]
Kearney, Missouri experienced an EF- 2 tornado that had a maximum width of 400 yards and traveled a length of 5.84 miles. The estimated peak winds were 115 miles per hour. The tornado began about 2 or 3 miles south and southeast of Kearney, MO, traveling east and northeast, ending about 2 miles north of Excelsior Springs, Damage to several homes and trees occurred.

Douglas and Leavenworth County, KS – May 28, 2019[xv]
Douglas and Leavenworth County are not in the Hazard Planning area; however, Leavenworth County is included in the Mid-America Regional Council's planning profile. These counties are part of the Kansas City area or very close. The tornado these counties experienced had a maximum width of one mile and traveled 31.82 miles. This tornado is the same one that reached Kearney, MO in the prior narrative. The tornado was rated EF-4. It developed in southwestern Douglas County Kansas and tracked to the east-northeast while strengthening. EF-3 damage occurred in northeastern Douglas County, then the storm gained strength and produced EF-4 damage in southern Leavenworth County Kansas.

4.6.2 Probable Locations

Magnitude: >50%

Tornadoes can occur anywhere in the Kansas City area. A common myth about tornadoes is that they do not cross over rivers or hit big cities.[xvi] The Orrick tornado of May 10, 2014, started in Jackson County south of Sibley and crossed the Missouri River into Ray County. The Orrick tornado of January 24, 1967 took a similar path. Additionally, one of the tornadoes spawned during the May 4, 2003, tornado outbreak in the northern Kansas City area swept across the Missouri River from Leavenworth County, Kansas, into Platte County, Missouri. The Ruskin Heights area of south Kansas City, a densely populated area, was struck by an F5 tornado on May 20, 1957, resulting in 37 deaths, hundreds of injuries and catastrophic damage to the area. More recently, the Joplin EF5 tornado of May 22, 2011, devastated a large portion of the city, resulting in 161 fatalities, over 1,000 injured and damage to 7,500 residential dwellings. Over 500 businesses were affected, affecting 4,500 to 5,000 employees.

The threat of tornadoes is not limited to any specific part of the Kansas City area; both rural and urban areas can be affected. Although greater in the spring and early summer, the possibility exists for destructive tornadoes to occur at any time of the year. Likewise, tornadoes may occur at any time of the day or night. Finally, tornadoes of all magnitudes can and have occurred in the Kansas City area, from F0 tornadoes that causing little or no damage to F5 tornadoes causing enormous death and destruction.

Each county was given a >50% magnitude rating. Although it is highly unlikely that a single tornado event will cause damage to more than 50 percent of the county, the highest magnitude rating was assigned to account for the random nature of tornadoes, in that the entire region is vulnerable to a tornado strike.

4.6.3 Impact and 4.64 Probability

Tornadoes can cause tremendous damage in the places it touches down, as well as the surrounding areas. **Table 4.6.4 – Table 4.6.8**[xvii] summarizes all tornado events by EF Scale and their impact for each

of the five counties. Information was retrieved from the NOAA NCDC Storm Event Database as of December 13, 2024. The property and crop damage values are the sum of reported values only. The NCDC labels these values as a 'basic estimate'. Damage values are most likely higher than the values due to unreported impacts. This information is used to determine severity, magnitude and probability of occurrence.

Table 4.6.4: Cass County Tornadoes (1950-2024)						
Magnitude	**Years with +1 Events**	**No.**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
F0	16	22	0	0	$11,340	$0
F1	7	11	0	1	$1,135,250	$0
F2	2	2	0	0	$275,000	$0
F3	4	5	3	25	$30,025,250	$0
F4	0	0	0	0	$0	$0
F5	0	0	0	0	$0	$0
Overall	**29**	**40**	**3**	**26**	**$31,446,840**	**$0**

Table 4.6.5: Clay County Tornadoes (1950-2024)						
Magnitude	**Years with +1 Events**	**No.**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
F0	8	9	0	0	$7,780	$0
F1	11	13	0	0	$6,325,780	$0
F2	7	7	0	9	$70,300,000	$0
F3	2	2	0	3	$4,025,000	$0
F4	2	3	0	18	$33,550,000	$0
F5	0	0	0	0	$0	$0
Overall	**30**	**34**	**0**	**30**	**$114,208,560**	**$0**

Table 4.6.6: Jackson County Tornadoes (1950-2024)						
Magnitude	**Years with +1 Events**	**No.**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
F0	15	22	0	0	$192,280	$0
F1	10	12	0	0	$580,000	$0
F2	6	8	0	5	$800,250	$0
F3	3	4	0	12	$7,500,000	$0
F4	1	1	0	0	$2,500	$0
F5	1	1	37	176	$2,500,000	$0
Overall	**36**	**48**	**37**	**193**	**$11,575,030**	**$0**

Table 4.6.7: Platte County Tornadoes (1950-2024)						
Magnitude	**Years with +1 Events**	**No.**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
F0	4	5	0	0	$60	$0
F1	4	4	0	2	$2,250,000	$0
F2	2	2	0	4	$275,000	$0
F3	4	4	0	11	$330,000	$0
F4	2	4	0	0	$32,750,000	$0
F5	0	0	0	0	$0	$0
Overall	**16**	**19**	**0**	**17**	**$35,605,060**	**$0**

Table 4.6.8: Ray County Tornadoes (1950-2024)						
Magnitude	**Years with +1 Events**	**No.**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
F0	9	10	0	0	$295,000	$0
F1	11	11	0	0	$507,750	$0
F2	6	8	0	2	$375,000	$0
F3	1	2	2	18	$2,750,000	$0
F4	1	2	0	1	$2,525,000	$0
F5	0	0	0	0	$0	$0
Overall	**28**	**33**	**2**	**21**	**$6,452,750**	**$0**

4.6.4 Probability of Future Occurrence: 61%

Based on historical occurrences from 1950, there is a 61 percent chance of a tornado occurring in a given year in the five-county planning area. Table 4.6.9 shows the probability of a tornado in a given year specific to each county. The probability was calculated by dividing the number of years with one or more tornado events in that county, by the total number of years the data was available. The data from the NOAA Storm Events database begins in 1951 and is current through 2024, a total of 73 years.

Table 4.6.9: Probability of Future Tornado Occurrence by County		
County	**Years with 1+ Events**	**Probability (%)**
Cass	29	40%
Clay	30	41%
Jackson	36	49%
Platte	16	22%
Ray	28	38%

The central United States has a repeatable annual tornado cycle, with the highest probability of tornadoes occurring in the spring.[xviii] With its location in the central plains, the Kansas City area experiences a tornado season each year. Figure 4.6.1 depicts the annual cycle of probability of tornadoes in the Kansas City area (NOAA NSSL, online data). The lines on the graph correspond to the states of Kansas and Missouri, indicated in the legend. As the graph shows, the period with the greatest probability of tornado activity is approximately late March through July. Although an update to this chart is not available past 2010, all of the tornadoes occurring in the last five years in the five county area happened in May and June.

Source: U.S. NOAA Tornado Climatology Website, monthly Tornado Occurrence Maps

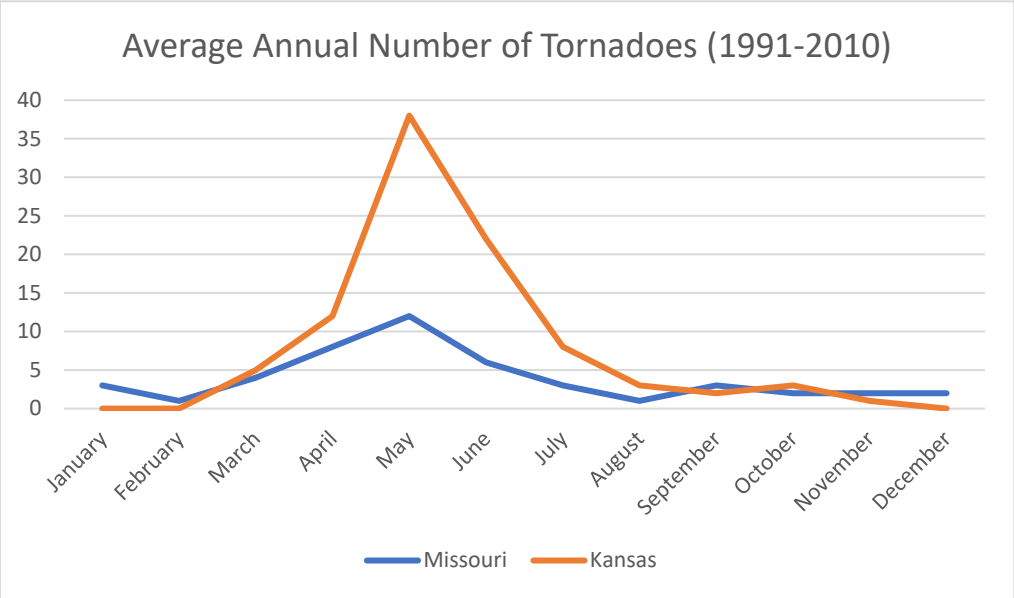


Figure 4.6.1: Tornado Annual Cycle in Missouri and Kansas (1991-2010)

Although, the likelihood of tornadoes is greatest during the spring and early summer — the "tornado season" — tornadoes can occur anywhere in the region, at any time of the year and at any hour of the day or night. For example, the deadly Blue Valley (Jackson County) tornado of 1941 occurred on Oct. 6, while an F3 tornado struck Orrick (Ray County) on Jan. 24, 1967. The entire region is at risk from tornadoes year-round.

4.6.5 Extent

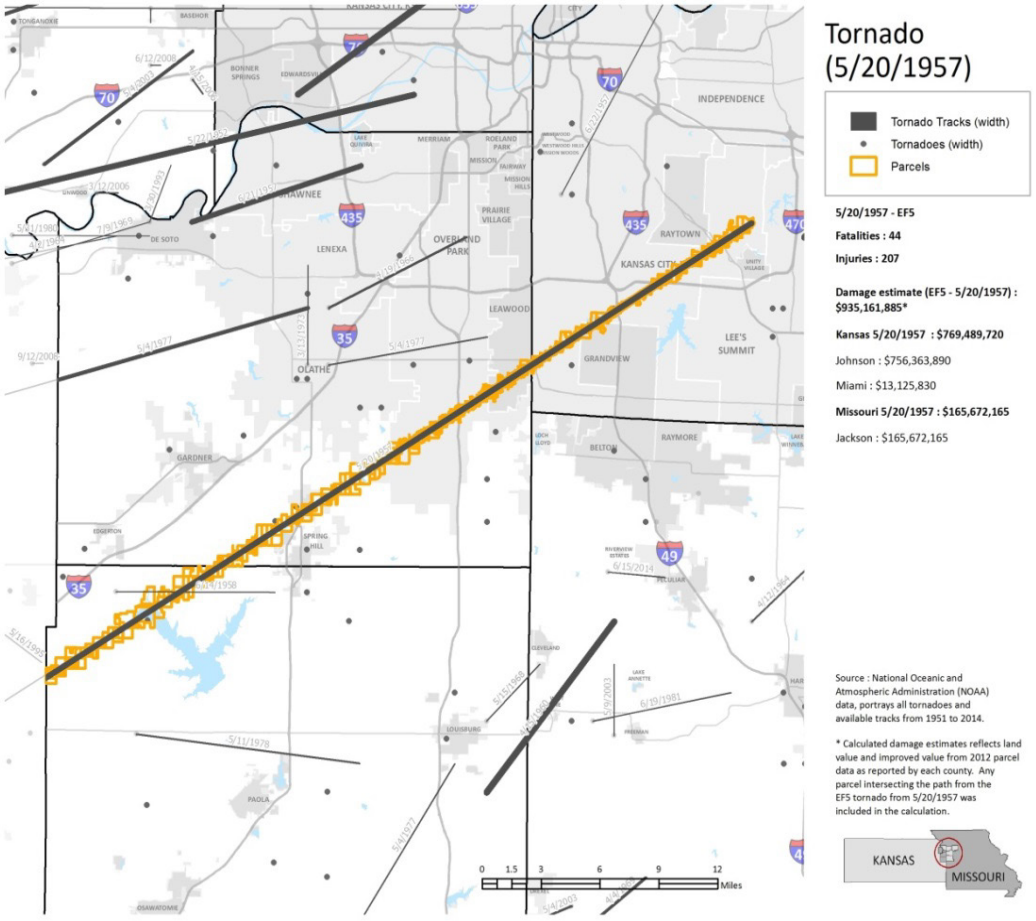
Historical statistics associated with the occurrence of tornadoes in the region, presented in Table 4.6.10. indicates the likelihood, or risk, by magnitude (EF-Scale) of a tornado occurring anywhere in the Kansas City region. The probable risk percentages are the likelihood of a tornado with a given EF occurring in a given year. For example, based on the 69-year history of tornadoes, there is a 60 percent chance of an EF0 tornado occurring in the Kansas City area.

Table 4.6.10: Risk of Future Tornado Occurrence		
EF-Scale	**Speed (mph)**	**Probable Risk (Highly Likely, Likely, Possible or Unlikely)**
0	65-85	60% — Highly Likely
1	86-109	64% — Highly Likely
2	110-137	43% — Likely
3	138-167	24% — Possible
4	168-199	7% — Unlikely
5	200-234	2% — Unlikely

Using the same probability calculation, Table 4.6.11, indicates the risk of a specific EF-Scale tornado occurring anywhere in the Kansas City region. For example, over the last 73 years, 2% of tornadoes were rated EF5. Although this percentage is low, an EF5 tornado poses catastrophic risk to people and property.

Table 4.6.11: Probable Future Tornado Severity by EF-Scale		
EF-Scale	**Speed (mph)**	**Probable Risk (Limited, Critical, or Catastrophic)**
0	65-85	60% — Limited
1	86-109	64% — Limited
2	110-137	43% — Critical
3	138-167	24% — Critical
4	168-199	7% — Catastrophic
5	200-234	2% — Catastrophic

Map 4.6.4 demonstrates the path of destruction and potential losses of an EF5 tornado based on the Ruskin Heights Tornado of May 20, 1957, if a similar event occurred in Jackson County today.



Map 4.6.3 Potential Impact of EF-5 Tornado on the Kansas City Region

Because of larger populations and greater concentration of homes, commercial structures, public facilities, utilities and infrastructure, the urban and suburban areas of Cass, Clay, Jackson, Platte and Ray counties are more susceptible to the damaging effects of tornadoes than the rural portions of these jurisdictions. Nevertheless, rural portions of the Kansas City metropolitan area can still suffer the effects of tornadoes. People may be injured or killed, just as in urban areas, though in lesser numbers due to lower population density. Outdoor warning systems may not be present in rural areas, increasing the need for other methods of warning, such as NOAA weather radios and television and radio broadcasts. Alternatively, urban areas may have more redundancy in warning systems. In addition, livestock may be killed, and crops damaged in rural areas. The costs associated with losses in rural areas may be significant. However, they will generally be lower than damage costs in urban areas.

Based on a 69-year history of tornado events in Cass, Clay, Jackson, Platte and Ray counties, Table 4.6.12 presents the likely adverse impact of future Kansas City region tornado events.

Table 4.6.12: Estimated Categories of Impact				
Effects of Tornadoes	**Life**	**Property**	**Emotional**	**Financial**
Without mitigation measures	Limited	Critical	Critical	Critical
With mitigation measures	Negligible	Limited	Limited	Limited

The potential severity of effects from tornadoes will continue to be high.[xix] Although the region will continue to experience deaths, injuries and property damages from tornadoes, mitigation measures can dramatically reduce adverse impacts of a tornado by helping to save lives, prevent injuries and lessen property damage.[xx] These measures include public education and awareness programs, public use of enhanced warning and communications systems (e.g., NOAA weather radios, mass notification systems and alerts), and the construction and use of "safe rooms" or "safe areas" in public and private structures.

4.6.5a Probable Duration

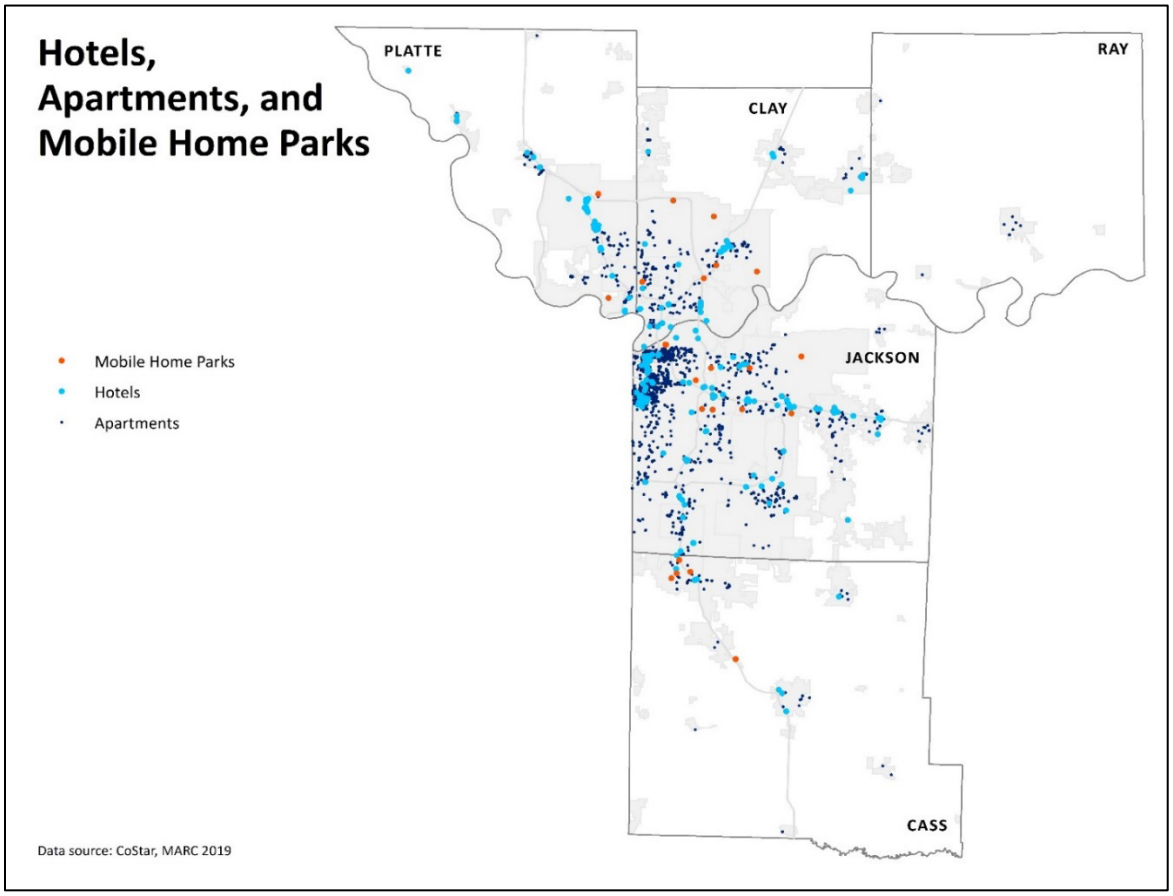
Tornadoes affecting the greater Kansas City metropolitan area have ranged from F0 to F5. The vast majority of tornadoes have been F0 to F1, although several F4 tornadoes and an F5 tornado have affected the Kansas City metropolitan area. Tornadoes of this magnitude are normally only on the ground for a few minutes.

Potential speed of onset (probable amount of warning time):

- ■ Minimal (or no) warning
- ☐ 6 to 12 hours warning
- ☐ 12 to 24 hours warning
- ☐ More than 24 hours warning

4.6.6 Vulnerability Analysis

While tornados can occur anywhere in the planning area, those most exposed when a tornado does occur are individuals who may not have access to some sort of safe shelter which may include individuals living in mobile homes or apartments or people living in homes without basements or those who may have difficulty getting to a safe location. Studies have indicated 45 percent of all fatalities during tornadoes occur in mobile homes, compared to 26 percent in traditional site-built houses.[xxi] Additionally, individuals who do not know where to go in the event of a tornado are also at greater risk in an event. Public venues and large outdoor gatherings are of special concern. **Map 4.6.4** and **Table 4.6.13** illustrate the number and type of particularly vulnerable sites in the planning area.

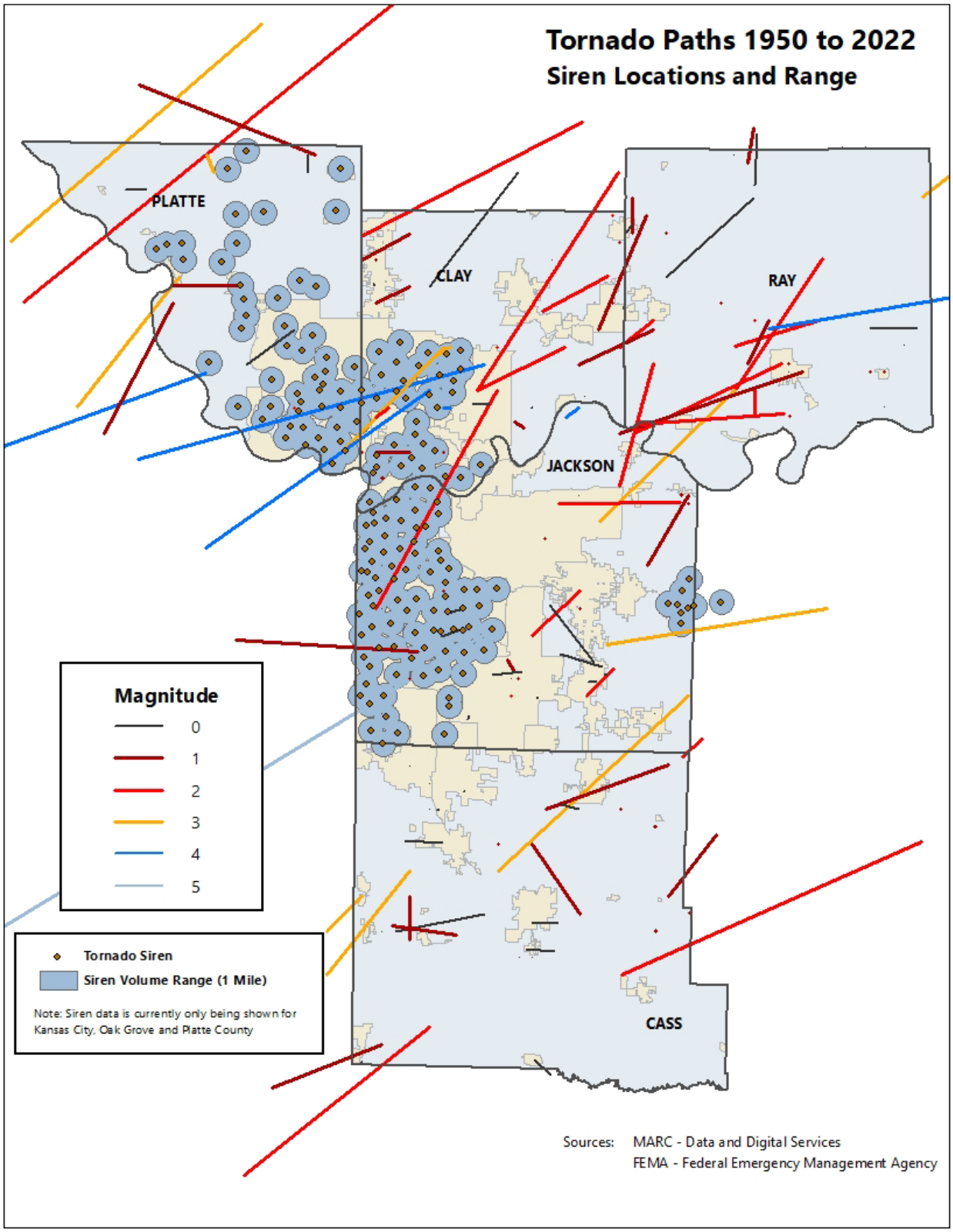


Map 4.6.4 High Risk Assets to Tornado in the Planning Area

Table 4.6.13 High Risk Locations during Tornadic Activity

Asset (critical facility)	Cass	Clay	Jackson	Platte	Ray	Planning Area	Kansas City
Day Care	41	91	350	29	8	511	238
Nursing Home	10	21	85	12	2	128	52
Public Housing	36	53	365	14	13	481	326
School	39	80	260	36	11	415	191
College	1	5	40	3	0	49	32
Hospital	2	4	13	1	1	21	8
Health Facilities	5	4	41	5	1	56	36
Police	15	16	25	17	9	82	15
Fire	17	27	67	17	6	128	38
PSAP	5	6	13	2	1	27	4
Local Government	13	15	13	12	4	53	1
Hotels	8	40	133	39	0	220	136
Apartments	83	248	1950	110	11	2391	1678
Trailer Parks	5	6	10	2	0	23	8
Professional Sports Stadiums	0	0	3	0	0	3	3
Arena or Convention Center	0	0	3	0	0	3	2

Tornado sirens typically have an audible range of one to two miles, but coverage can vary depending on factors like sound level and storm conditions. While sirens are the only universal warning protocol for severe weather in areas with adequate coverage, ubiquitous coverage is rare and should not be relied on from the public as the sole warning source for severe weather. As technological improvements occur, some areas have replaced sirens with more specific warnings, like the Emergency Alert System and Wireless Emergency Alerts. It should also be noted that sirens are an outdoor warning system designed only to alert those who are outside that something dangerous is approaching. The map below illustrates siren coverage in relation to historical tornado incidents.



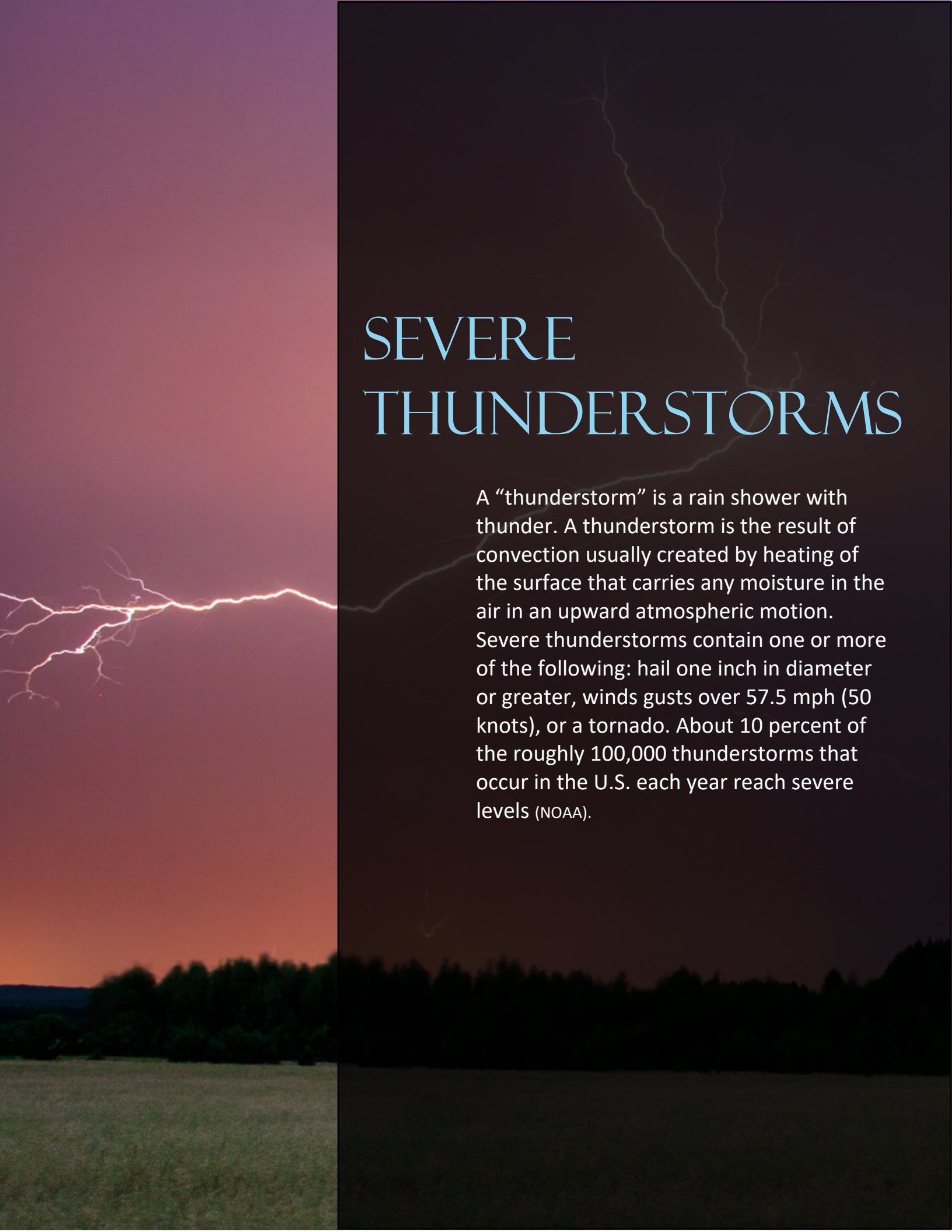
Map 4.6.5 Siren Coverage in Relation to Historical Tornadoes in the Planning Area

4.6.7 Problem Statements

Tornadoes are random events and can equally impact any jurisdiction within the region. While the maximum and minimum loss estimates were removed from this Plan, jurisdictions have provided problem statements outlining their concerns related to tornadoes. Problem statements, such as those below, can help highlight struggling areas to help support development of mitigation strategies for tornadoes:

- New tornado warning technologies have created the potential for uncoordinated warnings (or conversely, oversaturation) leading to residents not taking appropriate protective actions.
- High population centers (apartment buildings, trailer parks, shopping centers, hotels, etc.) often lack storm shelters.
- Current public information efforts have likely plateaued in their effectiveness.

[i] SEMA State Hazard Analysis, A-1; NOAA SPC Web site, online data
[ii] SEMA State Hazard Analysis, A-1
[iii] SEMA State Hazard Analysis, A-1
[iv] NOAA Web site, online data
[v] NOAA, NWS, The Enhanced Fujita Scale (EF Scale), https://www.weather.gov/oun/efscale
[vi] NOAA
[vii] WDAF TV 4 Web site, online data
[viii] WDAF TV 4 Web site, online data
[ix] Brooks and Doswell, NOAANSSL Web site, online document
[x] Brooks and Doswell, NOAA NSSL Web site, online document
[xi] NOAA Storm Protection Center Web site, http://www.spc.noaa.gov/fqu/tornado/
[xii] NOAA NCDC Web site
[xiii] Alan Blinder, "After One More Day of Tornadoes, Hope for a Respite," The New York Times https://www.nytimes.com/2019/05/29/us/tornadoes-weather.html
[xiv] NOAA NWS 28 May 2019 Tornadoes https://www.weather.gov/eax/28May2019_Tornadoes
[xv] NOAA NWS 28 May 2019 Tornadoes https://www.weather.gov/eax/28May2019_Tornadoes
[xvi] Weather Underground, *Tornadoes*: Fact Vs. Myth, online data
[xvii] NOAA NCDC Web Site, https://www.ncdc.noaa.gov/stormevents
[xviii] Tarp, NOAA OAR Web site, online document
[xix] SEMA State Hazard Analysis, Annex 2, Online
[xx] SEMA State Hazard Analysis, Annex 2, Online
[xxi] Northern Illinois University, "NIU Researchers Say Nighttime Tornadoes are Worst Nightmare," Press Release, November 5, 2008, available at www.Niu.edu/news



SEVERE THUNDERSTORMS

A “thunderstorm” is a rain shower with thunder. A thunderstorm is the result of convection usually created by heating of the surface that carries any moisture in the air in an upward atmospheric motion. Severe thunderstorms contain one or more of the following: hail one inch in diameter or greater, winds gusts over 57.5 mph (50 knots), or a tornado. About 10 percent of the roughly 100,000 thunderstorms that occur in the U.S. each year reach severe levels (NOAA).

4.7 Severe Thunderstorms (Wind, Hail, Lightning)

Many hazardous weather events are associated with thunderstorms. Under the right conditions, rainfall from thunderstorms can cause flash flooding, which kills more people each year than hurricanes, tornadoes or lightning. Lightning is responsible for many fires around the world each year and is also capable of causing fatalities. Hail up to the size of softballs damages cars and windows and can kill livestock caught out in the open. Strong straight-line winds associated with thunderstorms may knock down trees, power lines and mobile homes. Tornadoes (with winds up to about 300 mph) can destroy all but the strongest man-made structures.[i]

All thunderstorms produce lightning, so all thunderstorms can be dangerous. While lightning fatalities have decreased over the past 30 years, lightning continues to be one of the top three storm-related killers in the United States. In 2018, there were 20 fatalities and 82 injuries from lightning.[ii] Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms.[iii]

Other dangers associated with thunderstorms include tornadoes, strong winds, hail and flash flooding. The damaging straight-line winds of thunderstorms can exceed 100 mph. Some thunderstorms produce downbursts — a sudden outrush of damaging wind. Microbursts are smaller scale events that have a damage area less than 2.5 miles wide. Microbursts are larger events where the damage area is wider than 2.5 miles. Downbursts can produce strong wind shears (rapid changes in the speed and/or direction of wind over a short distance) near the surface. These types of winds are especially dangerous to aviation.[iv]

Thunderstorms associated with tornado development also contribute to the number one killer — flash floods.[v] According to the National Weather Service, Preliminary US Flood Fatality Statistics, floods and flash flooding are responsible for more fatalities — 182 fatalities in 2017 and 84 in 2018 — than any other thunderstorm-associated hazard. As of June 2019, there have been 67 flood fatalities in the United States.[vi] Dry thunderstorms, which produce rain that does not reach the ground, are most prevalent in the western United States. Falling raindrops evaporate, but lightning can still reach the ground and can start wildfires.[vii] Large hail can reach the size of grapefruit. Hail causes several hundred millions of dollars in damage annually to property and crops across the nation.

Thunderstorms are most likely to occur in the spring and summer months and during the afternoon and evening hours, but they can occur year-round and at all hours. Thunderstorms frequently form in the late afternoon and at night in the Plains states. The greatest severe weather threat extends from Texas to southern Minnesota, but no place in the U.S. is completely safe from the threat of severe weather.

4.7.1 Historical Occurrences

Historical occurrences described in this hazard profile are based on severe thunderstorm characteristics of winds more than 57 miles per hour and hail at least one inch in diameter. Other associated events were considered, including high winds, heavy rain and lightning; however, those events are fairly limited compared events with hail and damaging winds. Narratives of select storms are included in this discussion.

Table 4.7.1, Table 4.7.2, and Table 4.7.3 provide historical summaries of severe thunderstorms for wind, hail and lightning events between 1950-2018.

Table 4.7.1 Kansas City Area Thunderstorm Wind Events (1950- 2018) (>57mph)					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	171	1	7	464,500	0
Clay	237	0	2	2,175,000	0
Jackson	392	0	12	13,069,750	7,000
Platte	173	0	1	497,500	0
Ray	65	0	0	486,000	0
Total	**1,038**	**1**	**22**	**$16,692,750**	**$7,000**

Table 4.7.2 Kansas City Area Hail Events (1950- 2018) (>1")					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	225	0	0	3,554,000	250,000
Clay	259	0	0	5,035,500	55,000
Jackson	339	0	0	15,333,000	0
Platte	159	0	0	1,385,000	0
Ray	67	0	0	5,000	0
Total	**1,049**	**0**	**0**	**$25,312,500**	**$305,000**

Table 4.7.3 Kansas City Area Lightning Events (1950- 2018)					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	1	0	0	25,000	0
Clay	1	0	0	1,000	0
Jackson	8	1	1	327,000	0
Platte	1	0	0	100,000	0
Ray	2	0	0	10,000	0
Total	**13**	**1**	**1**	**$463,000**	**$0**

Table 4.7.4, **Table 4.7.5, Table 4.7.6** provide historical summaries of severe thunderstorms for wind, hail and lightning events between May 2019 to November 2024.

Table 4.7.4 Kansas City Area Thunderstorm Wind Events (5/19- 11/24) (>57mph)					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	44	0	0	$120,000	$0
Clay	47	0	0	$30,000	$0
Jackson	108	0	0	$7,000	$0
Platte	32	0	0	$20,000	$0
Ray	12	0	0	$0	$0
Total	**243**	**0**	**0**	**$177,000**	**$0**

Table 4.7.5 Kansas City Area Hail Events (5/19- 11/24) (>1")					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	17	0	0	$0	$0
Clay	36	0	0	$0	$0
Jackson	48	0	0	$0	$0
Platte	27	0	0	$0	$0
Ray	6	0	0	$0	$0
Total	**134**	**0**	**0**	**$0**	**$0**

Table 4.7.6 Kansas City Area Lightning Events (5/19- 11/24) (>57mph)					
County	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
Cass	0	0	0	$0	$0
Clay	1	0	1	$0	$0
Jackson	0	0	0	$0	$0
Platte	0	0	0	$0	$0
Ray	0	0	0	$0	$0
Total	**1**	**0**	**1**	**$0**	**$0**

Table 4.7.7 and Table 4.7.8 list thunderstorm wind and hail events (causing property damage) between 2014-2018.

Table 4.7.7: Kansas City Area Thunderstorm Events with Damaging Winds (2014-2018) (>57 mph)							
County	**Date**	**Location**	**Wind Speed (mph)**	**Deaths**	**Injuries**	**Property Damage ($)**	**Crop Damage ($)**
Cass	6/12/2016	Harrisonville	60	0	0	1,000	0
Clay	6/17/2017	Claycomo	70	0	0	10,000	0
Jackson	6/2/2018	Lake Lotawana	70	0	0	30,000	0
Jackson	6/2/2018	Cockrell	81	0	0	10,000	0
Jackson	8/28/2018	Kansas City	70	0	0	50,000	0
Platte	6/3/2015	Platte City	60	0	0	5,000	0

Table 4.7.8: Kansas City Severe Thunderstorms with Damaging Hail (2014-2018) (>1")							
County	**Data**	**Location**	**Hail Size (inches)**	**Deaths**	**Injuries**	**Property Damage ($)**	**Crop Damage ($)**
Cass	7/19/2018	Lake Winnebago	1.75	0	0	10,000	0

Table 4.7.9 lists thunderstorm wind events (causing property damage) between May 2019 to November 2024. The Kansas City Area did not record any events with damaging hail (>1") between 5/2019 and 11/2024 according to NOAA

Table 4.7.9: Kansas City Area Thunderstorm Events with Damaging Winds (5/19- 11/24) (>57 mph)							
County	**Date**	**Location**	**Wind Speed**	**Deaths**	**Injuries**	**Property Damage ($)**	**Crop Damage ($)**
Cass	05/04/2020	GARDEN CITY	65 kts. EG	0	0	$100,000	$0
Cass	06/11/2021	HARRISONVILLE	70 kts. EG	0	0	$20,000	$0
Clay	07/01/2020	ARLEY	52 kts. EG	0	0	$5,000	$0
Clay	12/15/2021	(MKC)KS CITY DNTN AR	67 kts. MG	0	0	$25,000	$0
Jackson	05/04/2020	SOUTH LEE	52 kts. EG	0	0	$2,000	$0
Jackson	07/01/2020	OAK GROVE	52 kts. EG	0	0	$5,000	$0
Platte	07/01/2020	EDGERTON	52 kts. EG	0	0	$20,000	$0

Table 4.7.10 lists lightning, high wind, and heavy rain events between 2014-2018.

Table 4.7.10: Kansas City Area Lightning, High Wind and Heavy Rain Events 2014-2018								
County	**Data**	**Location**	**Event Type**	**Wind Speed (mph)**	**Deaths**	**Injuries**	**Property Damage ($)**	**Crop Damage ($)**
Ray	11/11/2015	Ray (Zone)	High Wind	52	0	0	0	0
Jackson	11/11/2015	Jackson (Zone)	High Wind	54	0	0	0	0
Platte	11/11/2015	Platte (Zone)	High Wind	52	0	0	0	0
Clay	11/11/2015	Clay (Zone)	High Wind	52	0	0	0	0
Cass	11/11/2015	Cass (Zone)	High Wind	52	0	0	0	0
Jackson	4/29/2017	Jackson (Zone)	High Wind	50	0	0	0	0
Cass	4/29/2017	Cass (Zone)	High Wind	52	0	0	0	0
Jackson	5/17/2017	Jackson (Zone)	High Wind	52	0	0	0	0
Clay	6/16/2017	Paradise	Lightning		0	0	1,000	0
Jackson	6/17/2017	Leeds	Lightning		0	0	50,000	0
Jackson	8/21/2017	Dodson	Heavy Rain		0	0	0	0
Jackson	7/5/2018	Cement City	Lightning		1	0	0	0
Platte	1/28/2019	Platte (Zone)	High Wind	56	0	0	0	0
Clay	1/28/2019	Clay (Zone)	High Wind	56	0	0	0	0

Table 4.7.11 lists lightning, high wind, and heavy rain events between 5/2019 and 11/2024.

Table 4.7.11: Kansas City Area Lightning, High Wind and Heavy Rain Events (5/19- 11/24)								
County	**Date**	**Location**	**Event Type**	**Wind Speed**	**Deaths**	**Injuries**	**Property Damage ($)**	**Crop Damage ($)**
Cass	05/21/2019	CASS (ZONE)	High Wind	52 kts. EG	0	0	$0	$0
Cass	03/31/2023	CASS (ZONE)	High Wind	52 kts. EG	0	0	$0	$0
Clay	05/18/2019	PARADISE	Lightning		0	1	$0	$0
Clay	05/21/2019	CLAY (ZONE)	High Wind	52 kts. EG	0	0	$0	$0
Clay	12/15/2021	CLAY (ZONE)	High Wind	56 kts. EG	0	0	$0	$0
Jackson	05/21/2019	JACKSON (ZONE)	High Wind	52 kts. EG	0	0	$0	$0
Jackson	12/15/2021	JACKSON (ZONE)	High Wind	56 kts. EG	0	0	$0	$0
Jackson	03/31/2023	JACKSON (ZONE)	High Wind	52 kts. EG	0	0	$0	$0
Platte	05/21/2019	PLATTE (ZONE)	High Wind	51 kts. EG	0	0	$0	$0

Platte	12/15/2021	PLATTE (ZONE)	High Wind	56 kts. EG	0	0	$0	$0
Platte	03/31/2023	PLATTE (ZONE)	High Wind	51 kts. EG	0	0	$0	$0
Ray	12/15/2021	RAY (ZONE)	High Wind	56 kts. EG	0	0	$0	$0

Garden City – May 2020

The morning of May 3, 2020, brought a marginally severe storm into portions of east central Kansas and west central Missouri. This storm was somewhat isolated in the damage it caused, but the worsts of this two day event occurred the next day. The morning of May 4 started out incredibly active across eastern Kansas and western Missouri. In eastern Kansas several supercells formed and moved eastward into western Missouri. The initial round of supercells were generally decaying as they progressed eastward, but one particular supercell formed an enhanced downburst in western Bates County and produced between 70 and 90 mph winds. Upstream of this supercell in eastern Kansas 15-20 power poles were snapped near the intersection known as Jingo, KS. This storm then went on to produce heavy damage to trees and structures between Amsterdam and Butler. It was in this area just west of Passaic that a single fatality occurred when a tree fell into a house. After this storm moved out of the area a follow-up bow pushed through the same area producing pockets of strong winds that were recorded up to nearly 80 mph at more than one ASOS. Winds of around 70 to 80 mph occurred in Garden City as a strong, decaying thunderstorm moved into that area. While the storm was severe, the winds in and around Garden City were somewhat unique to the event and the damage across the city indicated some enhanced winds, probably associated with a significant downburst. While the official estimate is around 70 to 80 mph winds, it's plausible that faster winds were experienced in that area with this event solely based on the damage.

Kansas City Downtown Airport December 15, 2021

On December 15, 2021, a large-scale weather event rolled through the Central Plains and Upper Midwest bringing tornadoes, dust storms, wildfires, and snow across several central and northern states. Record high temperatures were set across the region including Kansas City, with the Kansas City International Airport tying its all-time December high temperature. Non-convective winds both ahead and behind the thunderstorms were quite strong. Several locations around the area reported wind gusts above 50 MPH with Lees Summit peaking at 53 MPH, St. Joseph reached 52 MPH, and Johnson County Executive Airport in Olathe, KS reached 60 MPH. Once the line of storms arrived, several areas reported winds in excess of 75 MPH. The Kansas City Downtown Airport reached a peak gust of 77MPH. This resulted in the roof damage to a few airport buildings. Numerous trees and power poles fell across much of eastern Kansas and western Missouri. Areas in far northwest Missouri observed winds of 80-90 MPH as the thunderstorms moved through. Several homes and buildings were damaged across northern Missouri including missing shingles, peeled siding, and blown out windows. While a local reporter was on the air covering the strong winds a roof was ripped off of a hangar at Kansas City Downtown Airport. While this happened, the ASOS measured 77 mph wind at the location

Oak Grove – July 2020
During the early morning hours of July 1, a strong thunderstorm complex came out of southeast Nebraska, into far northwest Missouri. This complex brought 70-80 mph winds and caused a swatch of damage from northwest Missouri, into north central Missouri. Most of the damage was to tree limbs and non-permanent structures. A large fireworks tent was destroyed.

Edgerton – July 2020
During the early morning hours of July 1, a strong thunderstorm complex came out of southeast Nebraska, into far northwest Missouri. This complex brought 70-80 mph winds and caused a swatch of damage from northwest Missouri, into north central Missouri. Most of the damage was to tree limbs and non-permanent structures. There were several tree limbs and at least one tree down in the Edgerton area. One of these tree limbs fell on the roof of a home and punctured through the roof and ceiling. There were no reported injuries.

Clay – May 18, 2019
A storm brought some strong winds to Platte County. A person was injured by lightning. The exact situation and extent of the injury is unknown.

Smithville – August 19, 2000
Thunderstorm winds estimated at 80 mph tore through the Smithville Lake area. Extensive damage was done to a marina, where 40 to 45 boats were damaged, and two of four docks were damaged. A nearby campground was also hit hard, as approximately 20 camping trailers were damaged. Two campers were hospitalized, including one who was inside an RV that rolled over. The severe thunderstorms developed ahead of a warm front in northeastern Kansas and moved east into northwest Missouri. The strongest storm crossed the Missouri River near Atchison, Kansas and caused extensive wind damage as it moved eastward to Richmond. The hardest hit area was in northern Clay County from Smithville Lake to Excelsior Springs. Property damages were estimated at $800,000.

Garden City – August 21, 2003
Severe thunderstorm winds estimated at 70 mph destroyed two mobile homes and caused two injuries. One of the victims later died from injuries sustained in the storm. One house had major damage with one injury. Numerous trees were downed or damaged along with outbuildings. Property damage was estimated at $150,000.

Leeds – June 15, 2017
On the afternoons of June 15 through June 17 multiple rounds of severe storms raked through western and central Missouri causing widespread wind damage and large hail. A tornado occurred in Lafayette County after dark, causing minor damage to rural areas north of Bates City. Lightning strike caused a tree to catch fire which then fell on to a house and resulted in a house fire.

Lake Winnebago and Garden City – July 19, 2018
On July 19, significant severe weather occurred in two distinct but consecutive rounds. The first round was a line of supercells that formed over the eastern Kansas City metro, produced significant hail up to baseball size, and drifted south southeast with time; the second was a Mesoscale Convective System (a complex of thunderstorms that organize as one) dropping southeast and producing straight-line winds across southwestern portions of the area. Caused $10,000 in damage.

Kansas City – August 28, 2018
On August 28, several thunderstorms affected the area with hail and wind. The winds ranged from 60 to 70 mph and did damage to trees, power lines, and some structures. Hail sizes ranged from penny to half-dollar sized. $50,000 in damage was reported. Broadcast media reported a couple were trapped in their home when a large tree fell onto it. The extent of the damage to the home is otherwise unknown.

4.7.2 Probable Locations

Magnitude 10%- 25%

Severe thunderstorms can occur anywhere in the Kansas City metro area. According to NOAA, the greatest severe weather threat in the U.S. extends from Texas to southern Minnesota. Severe Thunderstorm events often affect smaller portions of a county area. Therefore, all counites were given a 10%-25% magnitude rating.

4.7.3 Impact

Like tornadoes, the urban and suburban areas of Cass, Clay, Jackson, Platte and Ray counties are more susceptible to the damaging effects of thunderstorms than the rural portions of these jurisdictions due to larger populations and greater concentration of homes, commercial structures, public facilities, utilities and infrastructure. Nevertheless, thunderstorms can still impact rural portions of the Kansas City region. People may be injured or killed in rural as well as urban areas, though in lesser numbers due to lower population density; livestock may be killed, and crops damaged in rural areas. The costs associated with losses in rural areas may be significant, although generally lower than damage costs in urban areas. Rural residents may also tend to rely more on NOAA weather radios in addition to media broadcasts. More use of mass communication and notification systems in urban areas provide timely alerts and updates to residents in harms' way.

Table 4.7.10 – Table 4.7.12[viii] summarize all thunderstorm wind events more than 57 mph and the impact on each of the five counties in the planning area.

Table 4.7.10: Cass County Thunderstorm Wind Events (1950-2018) (>57 mph)

Wind Speed (mph)	Events	Deaths	Injuries	Property Damage $	Crop Damage $
57-67	108	0	0	47,500	0
68-81	52	1	4	357,000	0
82-100	6	0	0	0	0
Total	166	1	4	404,500	0

Table 4.7.12: Jackson County Thunderstorm Wind Events (1950-2018) (>57 mph)

Wind Speed (mph)	Events	Deaths	Injuries	Property Damage $	Crop Damage $
57-67	251	0	3	1,310,750	0
68-81	115	0	0	1,604,000	2,000
82-100	18	0	0	10,005,000	0
Total	384	0	3	12,919,750	2,000

Table 4.7.13: Platte County Thunderstorm Wind Events (1950-2018) (>57 mph)					
Wind Speed (mph)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	112	0	0	59,500	0
68-81	53	0	1	431,500	0
82-100	5	0	0	0	0
Total	170	0	1	491,000	0

Table 4.7.14: Ray County Thunderstorm Wind Events (1950-2018) (>57 mph)					
Wind Speed (mph)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	40	0	0	30,000	0
68-81	22	0	0	249,000	0
82-100	2	0	0	200,000	0
Total	64	0	0	479000	0

Table 4.7.15 – Table 4.7.19[ix] summarize all thunderstorm wind events more than 57 mph and the impact on each of the five counties in the planning area between May 2019 and November 2024.

Table 4.7.15: Cass County Thunderstorm Wind Events (5/19- 11/24) (>57 mph)					
Wind Speed (kts. EG)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	7	0	0	$100,000	$0
68-81	1	0	0	$20,000	$0
82-100	0	0	0	$0	$0
Total	**8**	**0**	**0**	**$120,000**	**$0**

Table 4.7.16: Clay County Thunderstorm Wind Events (5/19- 11/24) (>57 mph)					
Wind Speed (kts. EG)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	10	0	0	$25,000	$0
68-81	5	0	0	$0	$0
82-100	0	0	0	$0	$0
Total	**15**	**0**	**0**	**$25,000**	**$0**

Table 4.7.17: Jackson County Thunderstorm Wind Events (5/19- 11/24) (>57 mph)					
Wind Speed (kts. EG)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	21	0	0	$7,000	$0
68-81	4	0	0	$0	$0
82-100	0	0	0	$0	$0
Total	**25**	**0**	**0**	**$7,000**	**$0**

Table 4.7.18: Platte County Thunderstorm Wind Events (5/19- 11/24) (>57 mph)					
Wind Speed (kts. EG)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	5	0	0	$0	$0
68-81	0	0	0	$0	$0
82-100	0	0	0	$0	$0
Total	**5**	**0**	**0**	**$0**	**$0**

Table 4.7.19: Ray County Thunderstorm Wind Events (5/19- 11/24) (>57 mph)					
Wind Speed (kts. EG)	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
57-67	1	0	0	$0	$0
68-81	0	0	0	$0	$0
82-100	0	0	0	$0	$0
Total	**1**	**0**	**0**	**$0**	**$0**

Table 4.7.20 – Table 4.7.16 summarize hail events at least one inch in diameter and the impact on each of the five counties in the planning area.

Table 4.7.20: Cass County Hail Events (1950-2018) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	140	0	0	0	0
1.75-2.5	80	0	0	3,550,000	250,000
>2.75	5	0	0	4,000	0
Total	225	0	0	3,554,000	250,000

Table 4.7.21: Clay County Hail Events (1950-2018) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	146	0	0	0	0
1.75-2.5	98	0	0	2,535,500	55,000
>2.75	15	0	0	2,500,000	0
Total	259	0	0	5,035,500	55,000

Table 4.7.22: Jackson County Hail Events (1950-2018) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	215	0	0	3,000	0
1.75-2.5	111	0	0	14,330,000	0
>2.75	13	0	0	1,000,000	0
Total	339	0	0	15,333,000	0

Table 4.7.23: Platte County Hail Events (1950-2018) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	100	0	0	20,000	0
1.75-2.5	53	0	0	1,325,000	0
>2.75	6	0	0	40,000	0
Total	159	0	0	1385000	0

Table 4.7.24: Ray County Hail Events (1950-2018) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	35	0	0	0	0
1.75-2.5	30	0	0	5,000	0
>2.75	2	0	0	0	0
Total	67	0	0	5,000	0

Table 4.7.25 – **Table 4.7.29** summarize hail events at least one inch in diameter and the impact on each of the five counties in the planning area between May 2019 and November 2024.

Table 4.7.25: Cass County Hail Events (5/19- 11/24) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	9	0	0	$0	$0
1.75-2.5	3	0	0	$0	$0
>2.75	1	0	0	$0	$0
Total	**4**	**0**	**0**	**$0**	**$0**

Table 4.7.26: Clay County Hail Events (5/19- 11/24) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	24	0	0	$0	$0
1.75-2.5	4	0	0	$0	$0
>2.75	0	0	0	$0	$0
Total	**28**	**0**	**0**	**$0**	**$0**

Table 4.7.27: Jackson County Hail Events (5/19- 11/24) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	37	0	0	$0	$0
1.75-2.5	9	0	0	$0	$0
>2.75	0	0	0	$0	$0
Total	**46**	**0**	**0**	**$0**	**$0**

Table 4.7.28: Platte County Hail Events (5/19- 11/24) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	22	0	0	$0	$0
1.75-2.5	1	0	0	$0	$0
>2.75	0	0	0	$0	$0
Total	**23**	**0**	**0**	**$0**	**$0**

Table 4.7.29: Ray County Hail Events (5/19- 11/24) (>1")					
Hail Size	**Events**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
1-1.5	5	0	0	$0	$0
1.75-2.5	1	0	0	$0	$0
>2.75	0	0	0	$0	$0
Total	**6**	**0**	**0**	**$0**	**$0**

Historical statistics associated with the occurrence of severe thunderstorms in the region are presented in **Table 4.7.30** and based on wind gusts and hail size. The table provides an indication of the probable severity of a thunderstorm in the Kansas City region. The severity impact was calculated by taking the average of two percentages. The percentage of storms that have a respective hail size and the percentage of storms that have a respective wind gust speed. For example, a future severe thunderstorm has a 57% chance of having 1-1.5 inch. hail and 57-67 mph wind gusts, most likely causing a limited impact.

Table 4.7.30: Probable Future Severe Thunderstorm Severity		
Hail Size (inches)	**Wind Gusts (mph)**	**Probable Future Severity (Catastrophic, Critical, Limited or Negligible)**
1-1.5	57-67	57% — Limited
1.75-2.5	68-80	29% — Critical
>2.75	81-118	5% — Catastrophic

Based on the 69-year history of severe thunderstorm events across the region, **Table 4.7.31** presents the likely adverse impact of future Kansas City metropolitan area severe thunderstorm and related events.

Table 4.7.31: Estimated Categories of Impact				
Effects of Thunderstorms	**Life**	**Property**	**Emotional**	**Financial**
Without mitigation measures	Limited	Critical	Limited	Critical
With mitigation measures	Negligible	Limited	Negligible	Limited

Hail and wind events commonly occur in the Kansas City planning area. Mitigation measures can reduce the adverse impact of damaging winds, hail and heavy rains associated with severe thunderstorms, helping to save lives, prevent injuries and lessen property damage. Measures include public education and awareness programs and public use of enhanced warning and mass communication systems.

4.7.4 Probability of Future Occurrence: 93%

Although the likelihood of severe thunderstorms is greatest during the spring and early summer, they can occur anywhere in the region, at any time of the year and at any hour of the day or night. A review of historical statistics, summarized in **Table 4.7.32**, indicates the likelihood of a severe thunderstorm occurring anywhere in the Kansas City area based on hail size and wind gusts. For example, a future severe thunderstorm that has 1-1.5 inch. hail and 57-67 mph wind gusts are likely to happen in a given year.

Table 4.7.32: Probability of Future Severe Thunderstorm Events		
Hail Size (inches)	**Wind Gusts (mph)**	**Probability (Highly Likely, Likely, Possible, or Unlikely)**
1-1.5	57-67	57% — Likely
1.75-2.5	68-80	29% — Possible
>2.75	81-118	5% — Unlikely

4.7.5 Extent

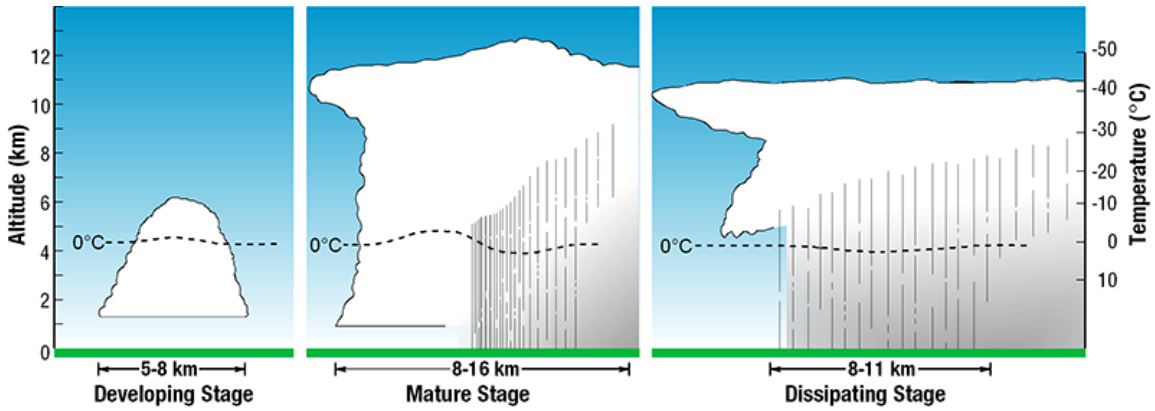
Watches and Warnings
NOAA meteorologists constantly monitor weather patterns, both nationally and locally, and issue watches and warnings as needed.

Severe Thunderstorm Watches are issued by NOAA Storm Prediction Center meteorologists who monitor the entire U.S. for weather conditions that are favorable for severe thunderstorms. A watch can cover parts of one or more states. The purpose of the watch is to encourage people to prepare for severe weather and stay alert to when warnings are issued.

Severe Thunderstorm Warnings are issued by local NOAA National Weather Service Forecast Office meteorologists who monitor a designated area for severe weather that has been reported by spotters or indicated by radar. Warnings mean there is a serious threat to life and property to those in the path of the storm. The purpose of the warning is to encourage people to act immediately to find safe shelter. A warning can cover parts of counties or several counties in the path of danger.

The Thunderstorm Life Cycle

Thunderstorms can look like tall heads of cauliflower or they can have "anvils." An anvil is the flat cloud formation at the top of the storm. An anvil forms when the updraft (warm air rising) has reached a point where the surrounding air is about the same temperature or even warmer. The cloud growth abruptly stops and flattens out to take the shape of an anvil. (**See Figure 4.7.1)**



Source: NOAA Website, online data

Figure 4.7.1: The Thunderstorm Life Cycle

Thunderstorm Types

Single-cell thunderstorms are small, brief, weak storms that grow and die within an hour or so, typically driven by heating on a summer afternoon. Single-cell storms may produce brief heavy rain and lightning.

Multi-cell storms are common thunderstorms in which new updrafts form along the leading edge of rain-cooled air (the gust front). Individual cells usually last 30 to 60 minutes, while the system may last for many hours. Multi-cell storms may produce hail, strong winds, brief tornadoes, and/or flooding.

Squall line refers to a group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain. Squall lines tend to pass quickly and are less prone to produce tornadoes than supercells. They can be hundreds of miles long but are typically only 10 or 20 miles wide.

Supercell thunderstorms are long-lived (lasting more than one hour) and highly organized storms that feed off an updraft (a rising current of air) that is tilted and rotating. This rotating updraft — which can be as large as 10 miles in diameter and up to 50,000 feet tall — can be present as much as 20 to 60 minutes before a tornado forms. Scientists call this rotation a mesocyclone when it is detected by Doppler radar. The tornado is a very small extension of this larger rotation. Most large and violent tornadoes come from supercells.

Bow echo refers to the radar signature of a squall line that "bows out" as winds fall behind the line and circulations develop on either end. A strongly bowed echo may indicate high winds in the middle of the line, where the storms are moving forward most quickly. Brief tornadoes may occur on the leading edge of a bow echo. Often the north side of a bow echo becomes dominant over time, gradually evolving into a comma-shaped storm complex.

Mesoscale Convective System (MCS) is a collection of thunderstorms that act as a system. An MCS can spread across an entire state and last more than 12 hours. On radar, one of these monsters might appear as a solid line, a broken line, or a cluster of cells. This all-encompassing term can include any of the following storm types:

- **Mesoscale convective complex (MCC)—**A particular type of MCS, an MCC is a large, circular, long-lived cluster of showers and thunderstorms identified by satellite. It often emerges out of other storm types during the late-night and early-morning hours. MCCs can cover an entire state.
- **Mesoscale convective vortex (MCV)—**A low-pressure center within an MCS that pulls winds into a circling pattern, or vortex. With a core only 30 to 60 miles wide and 1 to 3 miles deep, an MCV is often overlooked in standard weather analyses. But an MCV can take on a life of its own, persisting for up to 12 hours after its parent MCS has dissipated. This orphaned MCV will sometimes then become the seed of the next thunderstorm outbreak. An MCV that moves into tropical waters, such as the Gulf of Mexico, can serve as the nucleus for a tropical storm or hurricane.

Derecho refers to a widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. Although a derecho can produce destruction like that of tornadoes, the damage typically is directed in one direction along a relatively straight swath. As a result, the term "straight-line wind damage" is sometimes used to describe derecho damage. By definition, if the wind damage swath extends more than 240 miles (about 400 kilometers) and includes wind gusts of at least 58 mph (93 km/h) or greater along most of its length, the event may be classified as a derecho.

Seasonal Pattern: In general, severe thunderstorms may affect Greater Kansas City anytime; however, weather is most likely during the spring and summer months. But as historical records indicate, it is possible for severe thunderstorms to affect the region early or late in the season.

4.7.5a Probable Duration: Thunderstorms can strike so quickly and with little if any warning. The entire thunderstorm life cycle from the growing cumulus cloud to the dissipated storm can take only 30 minutes. Thunderstorms range between 5 and 25 miles in diameter making them much localized storms.[x]

Potential speed of onset (probable amount of warning time):

- ■ Minimal (or no) warning
- ■ 6 to 12 hours warning
- ☐ 12 to 24 hours warning
- ☐ More than 24 hours warning

4.7.6 Vulnerability Analysis

Vulnerable Assets

People: Death and injury can be sustained by fallen trees onto houses or cars, downed power lines, etc., due to damaging winds, or traffic accidents on rain-slick roads caused by heavy rains. People who remain in mobile homes are at tremendous risk. Roads may become blocked by tree limbs or downed power lines and inhibit the ability of emergency services and medical personnel to travel and assist people who are injured or in harm's way, posing a secondary hazard to life. Loss of electricity for

extended periods of time in the heat of summer could cause heat exhaustion. Large crowds at outdoor venues are also at a higher risk for injury and death unless nearby shelter is accessible.

Property: Damaging winds and hail can break branches or topple an entire tree, knocking down power and telephone lines, disrupting power and telephone service, causing property damage to vehicles, homes, commercial buildings and other structures. Flooded basements and backed up sewers can also damage property.

Transportation Infrastructure and Services: Rain-slick roads may result in traffic accidents. Roads may also be blocked, and traffic disrupted by downed trees, tree limbs and power lines. Heavy rain may reduce visibility and can temporarily disrupt or slow traffic.

Utilities: Fallen trees and branches can break and fall onto above-ground power and telecommunications lines, damaging the lines and disrupting power and service to customers. Utility poles and telecommunications towers may also be toppled by damaging winds.

Commerce and Essential Services: The costs associated with property damage, power restoration and debris removal can be low or high depending on the storm. Storms can delay surface, air and rail transportation by disrupting the temporary flow of goods and services. Commuters can be delayed or stranded causing a loss of business productivity. Downed power and telecommunications lines can interfere with businesses' ability to power equipment, communicate or execute financial transactions. Essential services such as law enforcement, fire protection and EMS may be hampered by road conditions.

Natural Environment: Damaging wind and hail events can cause considerable damage to trees and other vegetation, like severe winter storms. Trimming and removal efforts, though necessary in most cases, can exacerbate this problem.

All critical facilities are susceptible to the hazard. Refer to the supplemental hazard-specific information in Appendix C: Maps and References.

4.7.7 Problem Statements

Vulnerability statements, such as those below, can support development of mitigation strategies for severe thunderstorms:

- Severe thunderstorms with damaging winds and hail are frequent events within the Kansas City region and will likely continue to impact large areas.
- Cascading impacts of severe thunderstorms can have lasting, cross-jurisdictional impacts. Normal mutual-aid partners or regional resources may be unavailable or unable to support response.
- Mitigation measures to protect property tend to be expensive with cost-benefit ratio being challenging.
- As with tornadoes, current public information efforts have likely plateaued in their effectiveness.
- New warning technologies have created the potential for uncoordinated warnings (or conversely, oversaturation) leading to residents not taking appropriate protective actions.

[i] NOAA Web Site, http://www.nssl.noaa.gov/education/svrwz101/thunderstorms/
[ii] NOAA Storm Events Database
[iii] FEMA Web Site, https://www.ready.gov/thunderstorms-lightning
[iv] Missouri State Hazard Analysis, Annex A
[v] Missouri State Hazard Analysis, Annex A
[vi] NWS Preliminary US Flood Fatality Statistics, NOAA, https://www.weather.gov/arx/usflood
[vii] NOAA Web Site
[viii] NOAA NCDC Web Site, https://www.ncdc.noaa.gove/stormevents
[ix] NOAA NCDC Web Site, https://www.ncdc.noaa.gove/stormevents
[x] NOAA Web Site, http://www.erh.noaa.gov/lwx/swep/Spotting.html

SEVERE WINTER WEATHER

Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries.

4.8 Severe Winter Weather

Severe winter weather, including snow storms, ice storms and extreme cold, may affect any part of Cass, Clay, Jackson, Platte and Ray counties any given winter season. Although the annual snowfall amount in the Kansas City area is moderate — generally around 20 inches — the area may be affected by a full range of snowy conditions, including blizzards, blowing snow, snow squalls, snow showers and snow flurries.[i] These snowy conditions are defined as follows:

Blizzard – Winds of 35 mph or more with snow and blowing snow reducing visibility to less than one-quarter mile for at least three hours.

Snow Squalls – Brief intense snow showers accompanied by strong, gusting winds; accumulation may be significant.

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 Showers – Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

Drifting Snow – Uneven distribution of snowfall caused by strong surface winds. Drifting snow does not reduce visibility.

Snow Flurries – Light snow falling for short durations with little or no accumulation.

Source: *Winter Storms, The Deceptive Killers*, 2001, NWS Web site
Winter Weather Glossary, USA Today Web site

Ice storms may also affect the Kansas City area during the winter months. In ice storms, damaging accumulations of ice occur during a period of freezing rain.[ii] According to the NWS, significant accumulations of ice are defined as one-quarter inch or more of ice.[iii] Other icy conditions that may affect the Kansas City area include freezing rain and sleet. Freezing rain or freezing drizzle occurs when rain or drizzle freezes on surfaces, such as roads, bridges, cars and trees, forming a coating or glaze of ice.[iv] In freezing rain or freezing drizzle situations, air temperatures are warm enough for rain to form, but surface temperatures are below 32 degrees (i.e., below freezing), causing rain or drizzle to freeze on contact with surfaces.[v] Sleet is raindrops that freeze and form ice pellets before reaching the ground.[vi] Like hail, sleet may “bounce” when it hits the ground or other surface instead of sticking and forming a coating.[vii] Sleet, however, may accumulate like snow.[viii] sleet is the accumulation of half an inch or more of sleet.[ix]

4.8.1 Historical Occurrences

Severe winter weather is virtually an annual occurrence in the Kansas City area. Whether it is a snow storm, ice storm, freezing rain, sleet, period of extreme cold or combination of these conditions, citizens of the Kansas City area will normally experience some type of severe weather event each winter. Occurrences of severe winter weather spanning from 2014 to 2018 are depicted in Table 4.8.1. Historical occurrences occurring between May 2019 and November 2024 are depicted in **Table 4.8.2** Each

historical occurrence contains the beginning date of the severe winter weather event, the affected counties in the Kansas City area and a description of the damaging events.

Table 4.8.1 Historical Occurrences, Severe Winter Weather (2014- February 2019)

County	Date	Event Type	Deaths	Injuries	Property Damage $	Crop Damage $
Cass, Clay, Jackson, Platte, Ray	1/6/2014	Cold/Wind Chill	0	0	0	0
Cass, Clay, Jackson, Platte, Ray	2/4/2014	Heavy Snow	0	0	0	0
Cass, Clay, Jackson, Platte, Ray	3/1/2014	Winter Storm	0	0	0	0
Jackson	1/3/2015	Winter Weather	0	0	10,000	0
Clay	11/27/2015	Winter Weather	0	0	0	0
Platte	12/27/2015	Winter Storm	0	0	0	0
Platte	1/13/2017	Winter Weather	0	0	0	0
Jackson	1/12/2018	Cold/Wind Chill	1	0	0	0
Cass, Clay, Jackson, Platte, Ray	2/20/2018	Ice Storm	0	0	0	0
Cass	11/12/2018	Winter Weather	0	0	100,000	0
Cass, Clay, Jackson, Platte, Ray	11/25/2018	Blizzard	0	0	0	0
Cass, Clay, Jackson, Platte, Ray	1/11/2019	Winter Storm	0	0	0	0
Cass, Clay, Jackson, Platte, Ray	2/6/2019	Ice Storm	0	0	0	0
Jackson, Cass	2/15/2019	Winter Weather	0	0	1,500,000*	0

Source: NOAA NCDC Web site

*Jackson county reported $1,000,000 in property damage and Cass county reported $500,000 in property damage

Table 4.8.2 Historical Occurrences, Severe Winter Weather (2019- November 2024)						
County	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
CASS (ZONE)	2/14/21	Extreme Cold/wind Chill	0	0	$0	$0
CASS (ZONE)	2/15/21	Extreme Cold/wind Chill	0	0	$0	$0
CASS (ZONE)	2/16/21	Extreme Cold/wind Chill	0	0	$0	$0
CASS (ZONE)	12/22/22	Extreme Cold/wind Chill	0	0	$0	$0
CASS (ZONE)	1/12/24	Extreme Cold/wind Chill	0	0	$0	$0
CASS (ZONE)	03/10/2022	Heavy Snow	0	0	$0	$0
CASS (ZONE)	01/17/2020	Ice Storm	0	0	$0	$0
County	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
CLAY (ZONE)	2/14/21	Extreme Cold/wind Chill	0	0	$0	$0
CLAY (ZONE)	2/15/21	Extreme Cold/wind Chill	0	0	$0	$0
CLAY (ZONE)	2/16/21	Extreme Cold/wind Chill	0	0	$0	$0
CLAY (ZONE)	12/22/22	Extreme Cold/wind Chill	0	0	$0	$0
CLAY (ZONE)	1/12/24	Extreme Cold/wind Chill	0	0	$0	$0
CLAY (ZONE)	03/07/2022	Winter Weather	0	0	$0	$0
CLAY (ZONE)	01/17/2020	Ice Storm	0	0	$0	$0
County	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
JACKSON (ZONE)	2/14/21	Extreme Cold/wind Chill	0	0	$0	$0
JACKSON (ZONE)	2/15/21	Extreme Cold/wind Chill	0	0	$0	$0
JACKSON (ZONE)	2/16/21	Extreme Cold/wind Chill	0	0	$0	$0
JACKSON (ZONE)	12/22/22	Extreme Cold/wind Chill	0	0	$0	$0
JACKSON (ZONE)	1/12/24	Extreme Cold/wind Chill	0	0	$0	$0
JACKSON (ZONE)	03/10/2022	Heavy Snow	0	0	$0	$0
JACKSON (ZONE)	3/6/22	Winter Weather	0	0	$0	$0
JACKSON (ZONE)	11/15/22	Winter Weather	1	0	$10,000	$0

JACKSON (ZONE)	01/17/2020	Ice Storm	0	0	$0	$0
County	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
PLATTE (ZONE)	2/14/21	Extreme Cold/wind Chill	0	0	$0	$0
PLATTE (ZONE)	2/15/21	Extreme Cold/wind Chill	0	0	$0	$0
PLATTE (ZONE)	2/16/21	Extreme Cold/wind Chill	0	0	$0	$0
PLATTE (ZONE)	12/22/22	Extreme Cold/wind Chill	0	0	$0	$0
PLATTE (ZONE)	1/12/24	Extreme Cold/wind Chill	0	0	$0	$0
PLATTE (ZONE)	04/20/2021	Winter Weather	1 (indirect)	0	$200,000	$0
PLATTE (ZONE)	01/17/2020	Ice Storm	0	0	$0	$0
County	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
RAY (ZONE)	2/14/21	Extreme Cold/wind Chill	0	0	$0	$0
RAY (ZONE)	2/15/21	Extreme Cold/wind Chill	0	0	$0	$0
RAY (ZONE)	2/16/21	Extreme Cold/wind Chill	0	0	$0	$0
RAY (ZONE)	12/22/22	Extreme Cold/wind Chill	0	0	$0	$0
RAY (ZONE)	1/12/24	Extreme Cold/wind Chill	0	0	$0	$0

Narratives from events with property damage are stated below.

January 3, 2015 – Jackson County
The Kansas City area had a period of mixed precipitation. Rain preceded snow and the warm pavement melted the snowfall instantly. When a cold front came through the moisture froze to the pavement, causing slick conditions. An NWS employee was on their way to the office when they lost control of their vehicle on Highway 150, just west of the intersection with Highway 7. The car slid off the road and flipped in the ditch. The person was hospitalized for a short time before being released later that day.

November 15, 2022 – Jackson County
Overnight through the morning of November 15th some light snow fell, which accumulated on roadways causing a few automobile accidents. At least one of these accidents caused a fatality. Per MHP crash report, a eastbound pickup truck on Highway 150 just east of Highway 7 started sliding on the roadway, crossed the center, and collided head on with a small car traveling westbound. The driver of the of the car passed at the scene.

MHP Crash Report:
https://www.mshp.dps.missouri.gov/HP68/AccidentDetailsAction?ACC_RPT_NUM=220602365

November 12, 2018 – Cass County
Light snow began falling early in the morning on November 12. While the snow was generally light - moderate at times - 1 to 3 inches of snow fell across the area which caused area roads to become icy, and numerous vehicle accidents ensued. Up to 10 injuries had been reported, and 2 fatalities occurred as a result of the icy roads.[x] One such accident that resulted in a fatality occurred along I-49 (Mile Marker 160.2) in Cass County near the town of Archie around 10:00 am, when a vehicle slid off the road, struck a guardrail, and came back onto the road, where it was subsequently hit by a 18 wheeler. The driver of the vehicle died on the scene and the passenger was transported to a local hospital with minor injuries.[xi]

February 15, 2019 – Cass and Jackson Counties
Light to moderate snow began falling across the region in the mid to late morning hours on Friday February 15, 2019. By the early afternoon heavy snow had been falling for a couple hours and area roads became impassible. Around 3 to 4 inches accumulated on local roads, including I-70 just east of Kansas City. Reduced visibility due to the heavy snow prevented vehicles already on local roads from seeing hazards in their path, which resulted in several injury accidents. The reduced visibility caused a massive pile up at the Oak Grove exit on WB I-70. Several injuries occurred in this accident and one fatality occurred in the carnage that ensued. The pile up received high profile coverage on national media as a trucker caught up in the wreck took video from inside his cab. That video can be found at the following link. ||https://twitter.com/Dantej21/status/1096550488714170368 Another pile up occurred on I-49 between Belton and Peculiar. Most injuries in this accident were considered moderate and non-life threatening.

April 20, 2021 – Platte County
With slick roads causing accidents across the Kansas City Metro one such accident proved fatal, just on the Missouri side of the Missouri River along I-635 near where it intersects with Horizons Parkway. Icy roads have not been determined officially as the cause, but with icy roads that day it's strongly plausible as a contributor to the accident. An accident along I-635 just north of the Missouri River was fatal for one motorist. Icy roads have not been determined officially as the cause, but with 2 to 4 inches of snow on the roads causing slick conditions that morning it's strongly plausible as a contributor to the accident. A vehicle was travelling south along I-635 and crashed head on into a semi. This took place south of Horizons Parkway along I-635, but north of the Missouri River.

4.8.2 Probable Locations

Magnitude >50%

Severe winter weather events tend to be regional in scope. Therefore, the entire Kansas City metro area including Cass, Clay, Jackson, Platte and Ray counties may be affected. Therefore, all counites were given a >50% magnitude rating.

4.8.3 Impact

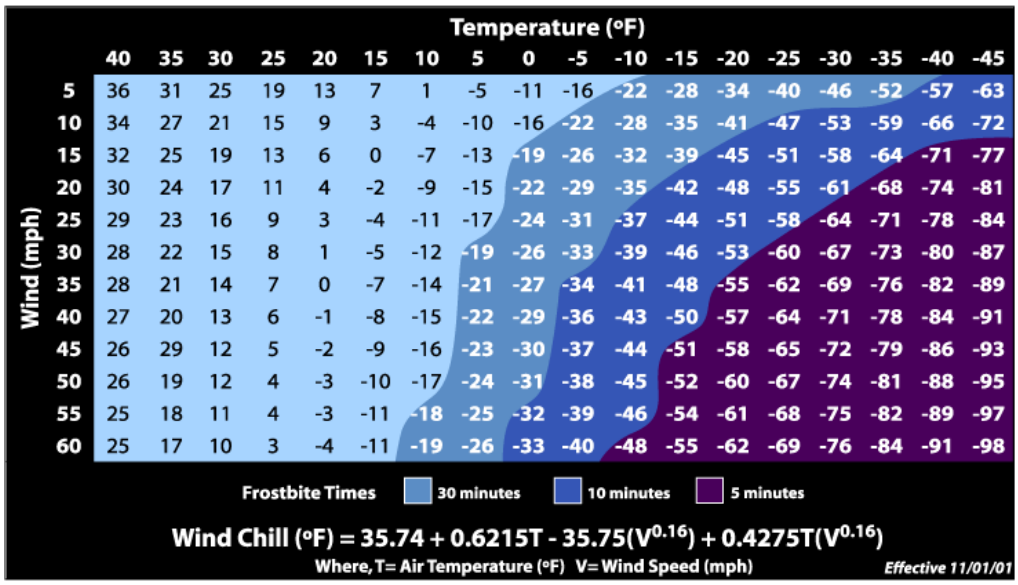
Historical occurrences have shown the impact severe winter weather can have on the Kansas City area. Winter storms have caused injuries and loss of life, traffic accidents, property damage, power outages, transportation and telecommunications disruptions, and economic losses. One of the most glaring examples of the impact severe winter weather can have on the Kansas City area is the ice storm of January 29-31, 2002, in which each of the five counties experienced many adversities. The damage costs associated with this severe winter storm were enormous — $61.9 million in federal public assistance alone — making it the second-costliest disaster in Missouri's history.

On average, Missouri counties north of the Missouri River receive annual snowfall of 18 to 22 inches; counties south of the Missouri River receive 8 to 12 inches. The events often involve borderline conditions of freezing rain, ice and high winds, causing high unpredictability. Besides snow and ice, extremely cold temperatures can produce problems. The wind chill is determined by factoring cold temperatures and wind speed. See **Figure 4.8.3**. The situation can be dangerous to people outdoors because their bodies can experience rapid heat loss, resulting in hypothermia (abnormally low body temperature).

Accidental poisonings and deaths are also more likely to occur in colder months. Carbon monoxide poisoning is one indirect winter hazard that can occur. Improperly vented gas and kerosene heaters or the indoor use of charcoal briquettes create dangerous levels of carbon monoxide. In Missouri, due to weather-related power outages there were 16 fatal cases and 52 non-fatal cases of non-fire carbon monoxide poisoning from 2006-2015. There is no current data for the 2015 – 2019 Plan period.[xii]

People: Winter storms are deceptive killers because many of the deaths and injuries that occur are indirectly related to the storm. Indirect causes of death and injury include traffic accidents on snow-covered or icy roads and heart attacks due to overexertion from shoveling snow and related activities. According to the NWS, about 70 percent of injuries related to ice and snow are the result of vehicle accidents, about 25 percent occur to people outdoors in a storm, and most happen to males more than 40 years old. Ice- or snow-covered roads, or roads blocked by tree limbs or power lines, may also inhibit the ability of emergency services and medical personnel to travel and assist people who are injured or in harm's way, posing a secondary hazard to life. Other, though less common, causes of injury and death indirectly related to severe winter weather include pedestrians slipping and falling on icy walkways, carbon monoxide poisoning from improperly vented heaters, and electrocutions and fires from downed power lines.

The most direct causes of injuries and death from severe winter weather are frostbite and hypothermia. Frostbite occurs when body tissue is damaged by extreme cold. (See **Figure 4.8.1**) Frostbite usually affects the body's extremities, such as fingers, toes, ear lobes and the tip of the nose, and causes a loss of feeling and a white or pale appearance. Hypothermia is a potentially deadly condition that occurs when body temperature drops to less than 95 degrees. Hypothermia can cause lasting kidney, liver and pancreas problems for those who survive the condition. Early symptoms of hypothermia include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and exhaustion. According to the NWS, approximately 50 percent of injuries related to cold temperatures occur in people more than 60 years old, more than 70 percent happen to men, and about 20 percent occur at home. The elderly, infants, the poor and the homeless may be particularly susceptible to extremely cold conditions.



Source: National Weather Service

Figure 4.8.3: 2001 NWS Wind Chill Index

Property: Residential and commercial property in the Kansas City area is susceptible to severe winter weather. Snow and ice may accumulate on trees, breaking branches or toppling the entire tree. Falling trees and branches can knock down power and telephone lines, disrupting power and telephone service. Falling trees and branches can also damage homes, commercial buildings and other structures. Ice can accumulate on power and telephone lines, causing them to break. Heavy accumulations of snow can cause roofs to collapse. Extremely cold temperatures may injure or kill unprotected pets and livestock, and damage or destroy crops. Extreme cold can also cause water lines in houses and commercial property to freeze and break.

Transportation Infrastructure and Services: Transportation infrastructure and services in the Kansas City area are highly susceptible to severe winter weather. Snow-covered and/or icy roads may result in traffic accidents. Bridges and overpasses are particularly susceptible to icy conditions because they tend to freeze sooner than other roadways. Roads may also be blocked, and traffic disrupted by downed trees, tree limbs and power lines. Heavy snow, ice, freezing rain, high winds and reduced visibility can close airports, disrupt barge traffic on the Missouri River and disrupt or slow rail traffic.

Utilities: Above-ground power and telecommunications lines in the Kansas City area are highly susceptible to severe winter weather. Heavy accumulations of snow and ice on trees can cause trunks and branches to break and fall on power and telecommunications lines, damaging the lines and disrupting power and service to customers. Utility poles and telecommunications towers may also be toppled by heavy accumulations of ice. The October 22-23, 1996, snow storm and the January 29-31, 2002, ice storm caused widespread power and telecommunications outages across the region. Older and more rural parts of the Kansas City area are generally more likely to experience service disruptions due to severe winter weather because they tend to have more above-ground power and

telecommunications lines than newer areas where those utilities are often underground. Extremely cold temperatures may cause main water lines to break, disrupting the supply of water to communities.

Commerce and Essential Services: By damaging property, hampering transportation and disrupting utility services, severe winter weather can have an adverse impact on the economy of a community. As an example, the costs associated with property damage, power restoration and debris removal following the January 29-31, 2002, ice storm were so high for local governments in the Kansas City area that Missouri received a Presidential Disaster Declaration. Cass, Clay, Jackson, Platte and Ray counties were among the 26 Missouri counties eligible for both federal Individual and public assistance programs because of this winter storm event. Severe winter weather can impact surface, air and rail transportation systems by disrupting the flow of goods and services into and out of the metro area. Similarly, commuters can be delayed or stranded, causing a loss of business productivity. Downed power and telecommunications lines can interfere with business' ability to power equipment, communicate or execute financial transactions. Essential services such as law enforcement, fire protection and EMS may be hampered by icy and hazardous road conditions. Area schools are routinely closed due to snow-covered or icy roads and extremely cold temperatures. In addition, beneficial programs for the elderly and/or persons with disabilities, such as home-delivered meals for home-bound senior citizens, may be temporarily curtailed due to the hazardous driving conditions snow-covered or icy roads.

Natural Environment: The early snow storm of October 22–23, 1996, and the ice storms of December 6, 1994, and January 29–31, 2002, caused considerable damage to the environment in the Kansas City area. Thousands of trees and other vegetation in both natural and developed areas were seriously damaged or destroyed by the storm. Trimming and removal efforts, though necessary in most cases, exacerbated this problem. In addition, air quality may have been affected due to the permitted burning of storm debris in some communities. All critical facilities are susceptible to the hazard. Refer to the supplemental hazard-specific information in Appendix C: Maps and References.

4.8.4 Probability of Future Occurrence: 92%

It is likely that some or all of the Kansas City metro area will experience some form of severe winter weather each year. At any hour of the day or night, snow, ice, freezing rain, sleet and/or extreme cold may affect the region in the wintertime (generally between November and April). As a result, the entire region is at risk from severe winter weather, with at 92 percent change of a winter storm including an ice storm, blizzard, extreme cold, heavy snow, freezing fog, or frost/freeze.

Some of the adverse effects of severe winter weather may be reduced, however, through certain mitigation measures, such as public education campaigns that stress winter safety; proper tree-trimming (to keep branches away from power lines); and programs to reduce, eliminate or defer home heating costs for low-income and at-risk residents.

Seasonal Pattern: In general, severe winter weather may affect Greater Kansas City between November and April; severe winter weather is most likely during the months of December, January and February. But, as historical records indicate, it is possible for severe winter weather to affect the region early in the season, such as October snow storms. Similarly, it is not uncommon for the Kansas City area to receive severe winter weather late in the season, such as snow or freezing rain in March.

4.8.5 Extent

In the winter, the Kansas City area's normal low temperatures are 22.5 degrees in December, 17.8 degrees in January and 23.2 degrees in February.[xiii] However, the area may also experience periods of extreme cold in the wintertime. For example, the lowest temperature on record for the Kansas City area was minus 23 degrees on Dec. 22–23, 1989.[xiv] The winter of 1978–79 had the lowest average seasonal temperature for the Kansas City metropolitan area: 21.5 degrees.[xv]

Exacerbating wintertime cold air temperatures is wind chill. Wind chill is not the actual air temperature, but rather how cold and wind feel on exposed skin.[xvi] As the wind velocity increases, heat is carried away from the body at an accelerated rate, lowering the body temperature.[xvii] People and animals' outdoors are affected by wind chill, a situation that can be dangerous, because hypothermia can result from loss of body heat.

The extent of severe weather storms can be characterized by advisories, watches, and warnings provided by NWS in advance of severe winter weather. These include:

Winter Weather Advisory – Winter weather conditions are expected to cause significant inconveniences and may be hazardous. However, if caution is exercised, these situations should not become life-threatening. In conditions warranting a winter-weather advisory, the greatest hazard is often to motorists.

Winter Storm Watch – A significant winter storm may affect the area, but its occurrence, location and timing are uncertain. A winter storm watch is issued to provide 12 to 36 hours' notice of the possibility of severe winter weather. A watch will often be issued when neither the path of a developing winter storm nor the consequences of the event are well-defined. A winter storm watch may be upgraded to a warning when the nature and location of the developing weather event becomes more apparent.

Winter Storm Warning – A winter storm warning is issued when hazardous winter weather is occurring, imminent or likely. A warning is used for winter weather conditions that may be a threat to life and property. Winter storm warnings are usually issued for heavy snow approaching or exceeding 6 inches, ice accumulations, dangerous wind chills or a combination of these conditions. Warnings can be issued for lesser amounts of snow, 3 to 6 inches, for example, if the snow occurs with strong winds more than 20 miles per hour and/or significant sleet or heavy ice accumulations from freezing rain. In the Central Plains, expected snow accumulation during a winter storm warning is 4 inches or more in 12 hours or 6 inches or more in 24 hours.

Wind Chill Warning – A wind chill warning is issued when life-threatening wind chills reach minus 50 degrees or below.

Ice Storm Warning – An ice storm warning is issued when a significant coating of ice, a quarter of an inch or more, is expected.

Heavy Snow Warning – A heavy snow warning is issued when snow accumulations are expected to approach or exceed 6 inches in 12 hours but will not be accompanied by significant wind. A heavy snow warning could also be issued if 8 inches or more of snow accumulation is expected in a 24-hour period. Sleet and freezing rain are not expected during a heavy snow warning.

Blizzard Warning – A blizzard warning is issued when sustained winds or frequent gusts of 35 mph may occur in combination with considerable falling and/or blowing snow for a period of at least three hours. In a blizzard warning, visibilities will frequently be reduced to less than one-quarter mile, and temperatures will often be extremely cold.

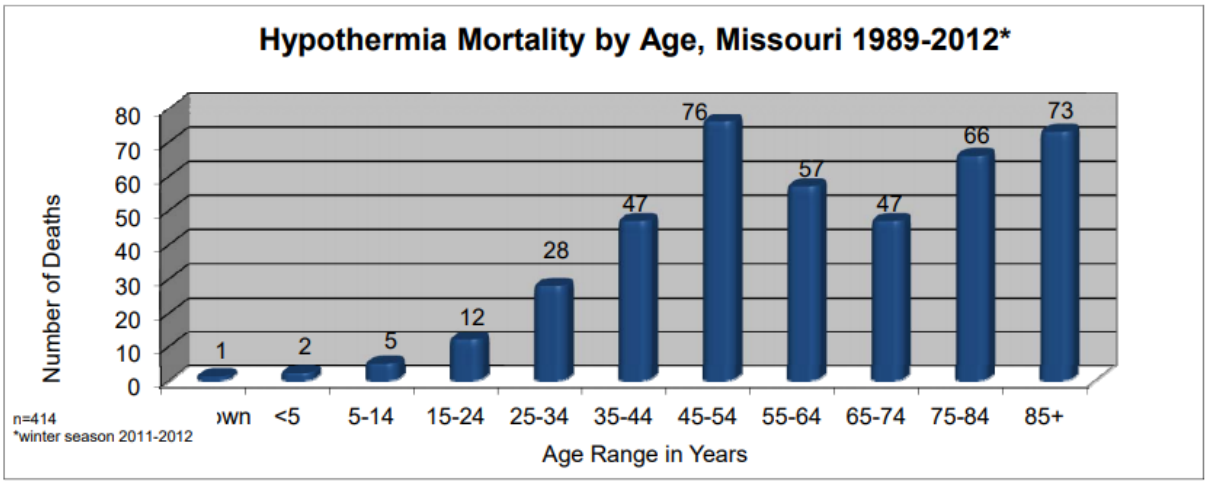
4.8.5a Probable Duration: The dangerous conditions associated with severe winter weather, such as accumulation of snow and ice or extremely low temperatures, can occur within a few hours. Snow and ice may be present for several days; extreme cold may also persist for several days. The cascading effects of severe winter weather, such as utility outages, can also last for several days. In the aftermath of the January 29–31, 2002, ice storm, some parts of the Kansas City area were without electrical power for more than a week.

Potential Speed of Onset (probable amount of warning time):

- ☐ Minimal (or no) warning
- ■ 6 to 12 hours warning
- ☐ 12 to 24 hours warning
- ☐ More than 24 hours warning

4.8.6 Vulnerability Analysis

Winter weather often affects the whole planning area at once. Only a few degrees may be the difference between rain, ice, or snow.[xviii] Vulnerable populations are more susceptible to extreme and winter weather. For instance, senior citizens without proper heating, can find it hard to keep body temperatures up. Figure 4.8.2 is graph created by the Missouri Department of Health and Senior Services showing larger quantities of death by hypothermia in the older age ranges.[xix] Additionally, icy road conditions could cause detrimental slipping and falling. Other vulnerable communities include low-income, children, and the homeless populations. See Planning Profile Appendix for maps of these vulnerable populations.



Source: Missouri Department of Health and Senior Services, Data and Statistical Reports | Note: This data represents the most current data available by the state.

Figure 4.8.2: Hypothermia Mortality by Age, 1989-2012

4.8.7 Problem Statements

Listing vulnerabilities, such as below, can support development of mitigation strategies for severe winter weather:

- Cascading impacts of severe winter weather can have lasting, cross-jurisdictional impacts. Normal mutual-aid partners or regional resources may be unavailable or unable to support response.
- Many critical facilities don't have emergency backup power or rely on generators that will need to be refueled in 24–72 hours.
- Economic impacts from extreme, long-duration winter storms will stress local government resources.
- Debris management/snow removal will likely be a tremendous challenge; many jurisdictions don't have approved debris management plans.
- Vulnerable populations may need assistance with transportation for essential trips or to move to shelter with heat.

[i] NCDC, online data; NWS Winter Storms Preparedness Guide, online document
[ii] USA Today Winter Weather Glossary, online data
[iii] USA Today Winter Weather Glossary, online data
[iv] USA Today Winter Weather Glossary, online data
[v] USA Today Winter Weather Glossary, online data
[vi] USA Today Winter Weather Glossary, online data
[vii] USA Today Winter Weather Glossary, online data
[viii] USA Today Winter Weather Glossary, online data
[ix] USA Today Winter Weather Glossary, online data
[x] News story: https://www.kshb.com/news/local-news/one-killed-in-henry-county-crash-caused-by-slick-roads
[xi] Missouri Highway Patrol Accident Report, https://www.mshp.dps.missouri.gov/HP68/AccidentDetailsAction?ACC_RPT_NUM=180680656
[xii] Missouri Carbon Monoxide Poisoning Surveillance pg. 11, <https://health.mo.gov/living/environment/carbonmonoxide/pdf/co-statistical-report.pdf>
[xiii] NOAA NCDC, online data
[xiv] NWS Kansas City/Pleasant Hill Web site, online data
[xv] NWS Kansas City/Pleasant Hill Web site, online data
[xvi] NWS Winter Storms Preparedness Guide, online document; SEMA State Hazard Analysis, C-1
[xvii] NWS Winter Storms Preparedness Guide, online document
[xviii] SEMA Hazard Mitigation Plan, pg. 354
[xix] Missouri Department of Health and Senior Services, Data and Statistical Reports, https://health.mo.gov/living/healthcondiseases/hypothermia/surveillance.php

FLOODING

FLASH FLOODS, RIVERINE FLOODS, LEVEE FAILURES, & DAM FAILURES

A flood is the partial or complete inundation of normally dry land. The various types of flooding include riverine flooding, coastal flooding, and shallow flooding. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

4.9 Flooding

Note: Floodplain maps for individual jurisdictions can be found in Appendix C: Maps and References.

With the exception of fires, floods are the most common and widespread of all-natural disasters. Most communities have experienced some type of flooding.[i] Flooding occurs when normally dry areas of land are partially or completely inundated by water.[ii] Floods are caused by a number of conditions, including widespread and/or intense rainfall; runoff from deep snow cover (usually a combination of heavy rain, rapid warming and rapidly melting snow); over-saturated soil (the ground cannot absorb any more water); frozen soil that cannot absorb as much water as soil that is not frozen; high river, stream or reservoir levels preceding heavy or extended rains; ice jams in rivers and streams (these can flood upstream locations and, when they break, downstream locations); and urbanization (large amounts of pavement and buildings inhibit water absorption by the soil and cause rainwater to flow into sewers and drainage ditches and overflow them).[iii] These same conditions that cause flooding have the potential to lead to levee failures and dam failures, resulting in even more extensive flooding. ***Levee Failures*** **and** ***Damn Failures*** are now included in the hazard category of "Flooding" in the 2020 Plan Update.

Several types of flooding have adversely affected the Kansas City area in the past and are expected to put the region at risk in the future: riverine floods, flash floods and sheet floods. Riverine flooding occurs when rivers, streams, lakes, reservoirs or drainage systems overflow due to excessive rainfall, rapid snowmelt or ice jams.[iv] According to FEMA, riverine floods can be either slow- or fast-rising, but generally occur over a period of days, inundating adjacent areas of land.[v] The low, relatively flat land adjoining rivers and streams is known as a floodplain. Floodplains are natural reservoirs for floodwaters, created over thousands of years by floods and the flow of a river or stream's waters.[vi] Floodplains are important components of basins, the land drained by a river and its tributaries. The Kansas City area, along with most of the northern and central parts of the state, lies within the Missouri River Basin. As a result, a significant portion of the region lies within floodplains.[vii]

Common nomenclature associated with riverine floods and floodplains include the terms "10-year flood," "50-year flood," "100-year flood," and "500-year flood." These terms describe the probability of flooding in any given year and are primarily used to determine flood insurance rates in flood hazard areas.[viii] A 10-year flood, for example, has a 10 percent chance of occurring in any given year; a 50-year flood has a 2 percent chance of occurring; a 100-year flood has a 1 percent chance of occurring; and a 500-year flood has a 0.2 percent chance of occurring. Because these terms are measures of probability, an event such as a 100- or 500-year flood has the same chance of occurring each year, regardless of when floods of similar magnitude have occurred, even if the occurrence was the previous year.[ix]

Although riverine floods are more damaging to property, flash floods are the most dangerous type of flooding that may affect the Kansas City area. Flash floods are generally caused by heavy rainfall over a short period of time, though they can also be caused by the breaching or overtopping of dams.[x] According to SEMA, flash flooding frequently impacts small rivers, creeks, streams, canals and drainage ditches and is characterized by a rapid accumulation or runoff of surface water from any source. Most flood-related deaths are the result of flash floods, which are likely to occur with little or no warning and can reach full peak in minutes.[xi]

Sheet floods may also affect portions of the Kansas City area. Sheet flooding is caused by a combination of excessive rainfall or snowmelt, over-saturated ground and inadequate drainage. Sheet flooding is a byproduct of urbanization and development and may occur in areas that are not within a floodplain. In

sheet flooding, water spreads out across the surface of the ground toward areas of lowest elevation, rather than flowing into a defined stream channel.[xii] Large amounts of pavement (e.g., roads and parking lots) and buildings facilitate the flow of rainwater into areas of low elevation and into drainage systems that cannot properly carry and disburse the tremendous amount of water produced by intense storm events. In this type of flooding, water may back up into residential and commercial property, particularly the basements of these structures, damaging mechanical systems, floors, walls, furniture and fixtures, and creating public health and safety problems.[xiii]

The average number of flood deaths in the United States has increased in recent years. From 1998-2018, an average of 86 people died in floods each year. From 2008-2018, the average rose to 95 fatalities each year. From 2015-2018, the average rose to over 100 fatalities each year due to flooding.[xiv] The Weather Chanel states that as climate change increases, the risk of heavy rainfall will increase. Causing the average number of flood deaths to increase.[xv]

The plan narrative and GIS maps provide information on specific locations within the region's cities and counties where past riverine and flash floods have resulted in human casualties or property damage. The information also provides location-specific information on areas subject to future flooding, including identification of 100-year and 500-year flood-prone areas.

The NWS provides advisories, watches, warnings and related products in advance of flooding. These include[xvi]:

Flash Flood Warning – Urban and small-stream flash flooding is imminent or is in progress and is life threatening.

Flood Warning – Major river flooding is imminent or in progress.

Flash Flood/Flood Watch – A threat of flash flooding or flooding exists, but an occurrence is not yet certain or imminent. A watch is usually issued with six or more hours of lead time.

Small-Stream Flood Warning – Small-stream flooding is imminent or in progress. Flooding is not life threatening but is causing property damage.

Urban Flood Warning – Urban flooding is imminent or in progress. Flooding is not life threatening but is causing property damage.

Urban and Small-Stream Flood Warning – Urban and small-stream flooding is imminent or in progress. Flooding is not life threatening but is causing property damage.

Urban and Small-Stream Flood Advisory – Urban and/or small-stream flooding is a significant inconvenience. Flooding is not life threatening or causing property damage.

Flash Flood Statement – Issued to provide more information on a Flash Flood Watch or Warning, or to cancel all or part of those products.

Flood Statement – Issued to provide more information on a Flood Watch, Warning or Advisory, or to cancel all or part of those products.

Local Storm/Spotter Report – Issued to report flash flooding or other types of flooding by time, location and effect, e.g., damage, deaths or injuries; also, includes the information source.

4.9.1 Historical Occurrences

Unfortunately, the Kansas City area has a long history of flooding. Several of the region's largest and most destructive riverine floods include the Flood of 1844, Flood of 1903, Flood of 1951 and the Great Midwest Flood of 1993. Examples of some of the most significant flash floods to affect the Kansas City area include the Sept. 12, 1977 Flash Flood and the Oct. 4, 1998 Flash Flood. Table 4.9.1 depicts flooding events between 2014-2019. Table 4.9.2 depict flooding events by county occurring during 2019-2024.

Table 4.9.1: Kansas City Area Flood Events by County (2015- April 2019)

County	Location	Date	Event Type	Deaths	Injuries	Property Damage $	Crop Damage $	Cause
Cass	FREEMAN	5/30/2016	Flash Flood	0	0	0	0	Heavy Rain
Cass	AVON	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Cass	FREEMAN	7/27/2017	Flood	0	0	0	0	Heavy Rain
Cass	PLEASANT HILL	7/27/2017	Flood	0	0	0	0	Heavy Rain
Cass	HARRISONVILLE	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Cass	STRASBURG	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Cass	BELTON VILLNAVE ARPT	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Cass	PLEASANT HILL ARPT	3/26/2018	Flash Flood	0	0	0	0	Heavy Rain
Cass	PLEASANT HILL	3/26/2018	Flash Flood	0	0	0	0	Heavy Rain
Cass	AVON	4/30/2019	Flash Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Clay	GLENAIRE	5/16/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	LIBERTY	5/16/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	PRATHERSVILLE	5/17/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	KEARNEY	5/17/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	EXCELSIOR SPGS	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	EXCELSIOR SPGS ARPT	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain

Clay	ARLEY	6/4/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	MOSBY	6/4/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	KEARNEY	6/21/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	EXCELSIOR SPGS	6/21/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	MOSBY	6/26/2015	Flash Flood	0	0	0	0	Heavy Rain
Clay	STOCKDALE	4/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	NORTH KANSAS CITY	5/23/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	GASHLAND	5/23/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	PRATHERSVILLE	7/3/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	KEARNEY	8/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	BIGHAM HGT	8/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Clay	MOSBY	8/27/2016	Flood	0	0	0	0	Heavy Rain
Clay	OAKWOOD	7/26/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	GASHLAND	7/26/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	GLADSTONE	7/26/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	NORTH KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	GASHLAND	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	NASHUA	8/21/2017	Flood	0	0	0	0	Heavy Rain
Clay	KEARNEY	8/21/2017	Flood	0	0	0	0	Heavy Rain
Clay	NASHUA	8/21/2017	Flood	0	0	0	0	Heavy Rain
Clay	MOSBY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	LIBERTY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	SMITHVILLE	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Clay	NORTH KANSAS CITY	10/8/2018	Flash Flood	0	0	0	0	Heavy Rain
Clay	NORTH KANSAS CITY	4/1/2019	Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Jackson	KANSAS CITY	5/16/2015	Flash Flood	0	0	0	0	Heavy Rain

Jackson	RED BRIDGE	5/16/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY DWTN	5/17/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	5/17/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY DWTN	5/17/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	RED BRIDGE	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY DWTN	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	RAYTOWN	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LEEDS	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LEEDS	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	SOUTH LEE	7/1/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	BELVIDERE	7/1/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	SOUTH LEE	7/1/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	GREENWOOD	7/1/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	BELVIDERE	7/1/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY HEART AR	7/6/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LEEDS	7/20/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	9/10/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	9/10/2015	Flash Flood	0	0	0	0	Heavy Rain
Jackson	BLUE SPGS	5/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Jackson	OAK GROVE	7/3/2016	Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY DWTN	3/6/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain

Jackson	LEEDS	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	HOLMES PARK	7/27/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LEEDS	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	SUGAR CREEK	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KNOBTOWN	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	GRAIN VLY	8/6/2017	Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	(GVW)RICHARDS-GEBAUR	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	RED BRIDGE	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LEEDS	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain

Jackson	MARTIN CITY	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	RED BRIDGE	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Jackson	SNI MILLS	3/26/2018	Flash Flood	0	0	0	0	Heavy Rain
Jackson	FAIRMONT	5/25/2018	Flood	0	0	0	0	Heavy Rain
Jackson	SUGAR CREEK	10/8/2018	Flash Flood	0	0	0	0	Heavy Rain
Jackson	DODSON	10/8/2018	Flash Flood	0	0	0	0	Heavy Rain
Jackson	HOLMES PARK	4/30/2019	Flood	0	0	0	0	Heavy Rain
Jackson	UNITY VLG	4/30/2019	Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Platte	FARLEY	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	HAMPTON	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	RIDGELY	7/6/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	WESTON	7/6/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	WESTON	7/6/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	EDGERTON	7/6/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	LINKVILLE	9/10/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	TIFFANY SPGS	9/10/2015	Flash Flood	0	0	0	0	Heavy Rain
Platte	PARKVILLE	4/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Platte	EDGERTON	4/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Platte	FERRELVIEW	5/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Platte	RIVERSIDE	5/26/2016	Flash Flood	0	0	0	0	Heavy Rain
Platte	WALDRON	7/3/2016	Flash Flood	0	0	0	0	Heavy Rain
Platte	PARKVILLE	7/3/2016	Flood	0	0	0	0	Heavy Rain
Platte	RIVERSIDE	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	WALDRON	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	PLATTE WOODS	8/5/2017	Flash Flood	0	0	0	0	Heavy Rain

Platte	BARRY	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	PARKVILLE	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	RIVERSIDE	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	RIVERSIDE	8/21/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	NORTHMOOR	8/22/2017	Flash Flood	0	0	0	0	Heavy Rain
Platte	BEAN LAKE	3/14/2019	Flood	0	0	100,000	100,000	Heavy Rain/Snow Melt
Platte	BEAN LAKE	4/1/2019	Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Ray	LAWSON	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Ray	VIBBARD	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Ray	FLEMING	6/3/2015	Flash Flood	0	0	0	0	Heavy Rain
Ray	LAWSON	6/4/2015	Flash Flood	0	0	0	0	Heavy Rain
Ray	RICHMOND	6/21/2015	Flash Flood	0	0	0	0	Heavy Rain
Ray	UNION	9/14/2016	Flood	0	0	0	0	Heavy Rain
Ray	FLOYD	4/1/2019	Flood	0	0	0	0	Heavy Rain

Source: NOAA NCDC Web site

Table 4.9.2: Kansas City Area Flood Events by County (May 2019- November 2024)

County	Location	Date	Event Type	Deaths	Injuries	Property Damage $	Crop Damage $	Cause
Cass	HARRISONVILLE	5/24/19	Flash Flood	0	0	0	0	Heavy Rain
Cass	EAST LYNNE ARPT	7/4/19	Flash Flood	0	0	0	0	Heavy Rain
Cass	PLEASANT HILL	7/4/19	Flash Flood	0	0	0	0	Heavy Rain
Cass	STRASBURG	7/5/19	Flash Flood	0	0	0	0	Heavy Rain
Cass	HARRISONVILLE	9/28/19	Flash Flood	0	0	0	0	Heavy Rain
Cass	PECULIAR	5/28/20	Flash Flood	0	0	0	0	Heavy Rain

Cass	PECULIAR	4/28/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	HARRISONVILLE	4/28/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	FREEMAN	4/28/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	WEST LINE	4/28/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	CREIGHTON	5/27/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	EAST LYNNE ARPT	5/27/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	GARDEN CITY	6/25/21	Flash Flood	0	0	0	0	Heavy Rain
Cass	LISLE	6/28/21	Flash Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Clay	NORTH KANSAS CITY	5/24/19	Flash Flood	0	0	0	0	Heavy Rain
Clay	MOSBY	5/24/19	Flash Flood	0	0	0	0	Heavy Rain
Clay	SMITHVILLE	5/28/19	Flash Flood	0	0	0	0	Heavy Rain
Clay	ARLEY	9/27/19	Flash Flood	0	0	0	0	Heavy Rain
Clay	NORTH KANSAS CITY	5/28/20	Flash Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Jackson	KANSAS CITY	5/24/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	BLUE SUMMIT	5/24/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	6/21/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	6/21/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	EAST INDEPENDENCE	6/21/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	6/21/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	SOUTH LEE	7/4/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	OAK GROVE	7/4/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	LAKE LOTAWANA	7/4/19	Flash Flood	0	0	0	0	Heavy Rain

Jackson	GRANDVIEW	7/4/19	Flash Flood	0	0	0	0	Heavy Rain
Jackson	TARSNEY LAKES	9/5/20	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	5/16/21	Flash Flood	0	0	0	0	Heavy Rain
Jackson	KANSAS CITY	7/1/24	Flash Flood	0	0	$5,000	$1,000	Heavy Rain
Jackson	KANSAS CITY	7/1/24	Flash Flood	0	0	$5,000	$1,000	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Platte	WALDRON	04/28/2021	Flash Flood	0	0	0	0	Heavy Rain
County	**Location**	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**	**Cause**
Ray	VIBBARD	06/25/2021	Flood	0	0	0	0	Heavy Rain

June 28, 2021 – Cass County
Heavy rain produced some marginal flash flooding in Miami County Kansas and nearby Bates County Missouri. MODOT reported that HWY 18 was closed due to flooding.

May 28, 2020 – Clay County
On the morning of May 28 there was some minor flash flooding, causing some roads in the area to shut down briefly. There was flooding on the ramp of Briarcliff and Southbound HWY 9.

July 1, 2024 – Jackson County
During the morning and early afternoon hours of July 1st, heavy rainfall yielded flash flooding across much of the southern two-thirds of Jackson County. A swath of 3 to 6” of rain with isolated locations up to 7” fell within about a 3 hour time period from about 930 am to 1230 pm. Up to 6 inches of rain fell across portions of Jackson County within a span of a couple hours, causing widespread flash flooding across much of Jackson County. Major roadways were flooded and closed down, with several water rescues.

April 28, 2021 – Platte County
After heavy rain moved through the Kansas City Metro several local roadways were inundated with running water. After 1-2 inches of rain fell over a short period of time there was flooding along Jones-Myer Road and Hillsboro Road near Waldron.

June 25, 2021 – Ray County
Late in the afternoon, and through the evening hours on June 24 a cluster of storms over southeast Nebraska congealed into a line of thunderstorms that focused across northern Missouri. Most notably within this line of storms was a cluster of QLCS tornadoes that formed in Grundy County. There may have been other tornadoes associated with circulations that were noted on radar, but emergency management confirmed damage consistent with tornadoes near Trenton and Laredo Missouri. Most of the damage was minor, but some grain bins being blown off their foundation was the highlight of the damage in the area. Rainfall was the other big story with this event as some areas received 6 to 10

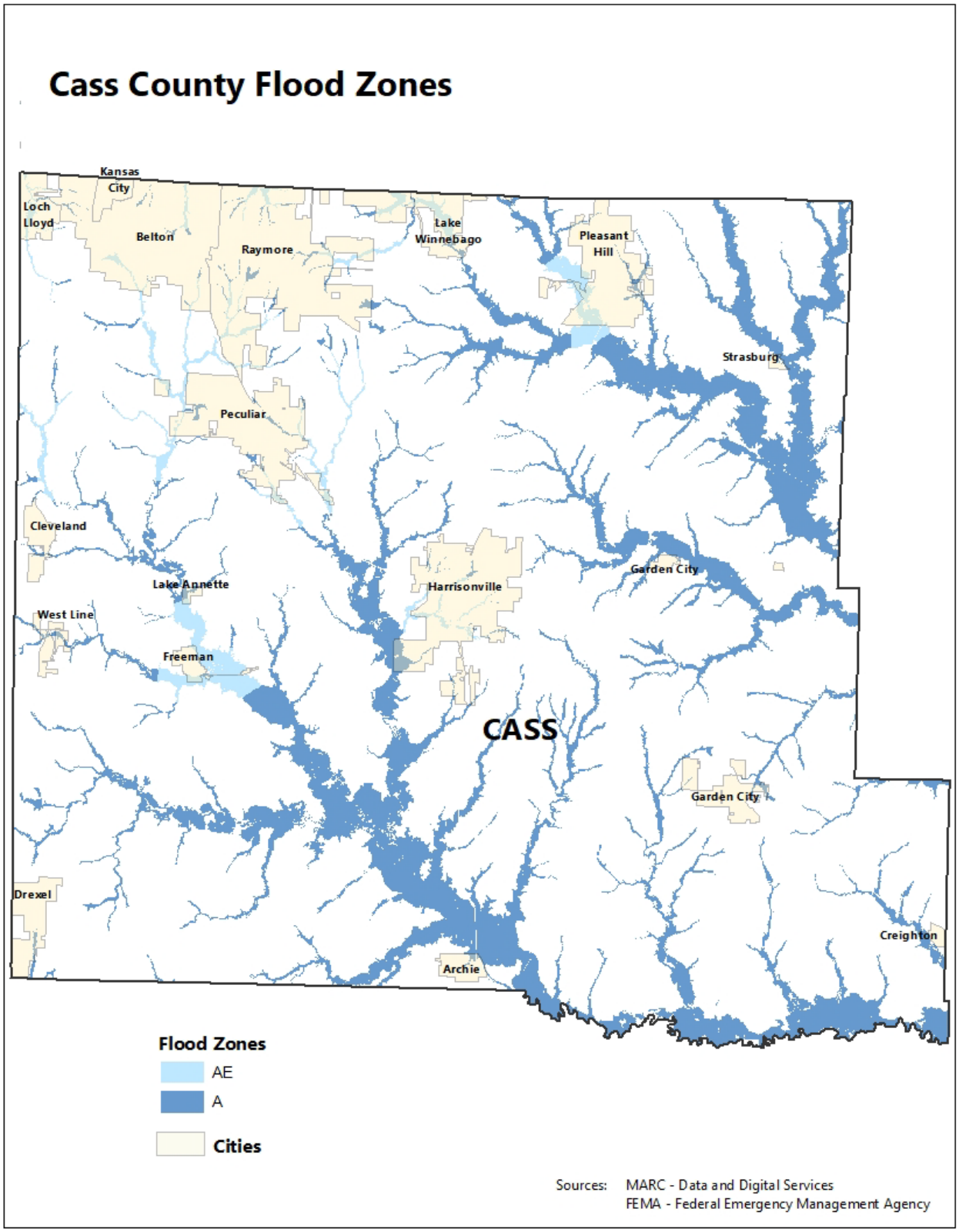
inches of rain. Despite the excessive rain, the flash flooding was rather minor, however there were still numerous roads closed, and areas near Excelsior Springs were especially hard hit as the Fishing River rose out of its banks. Another semi-dramatic event occurred along I-29 just north of St. Joseph, where a crane that was being used to do road construction became unbalanced and tipped. Numerous water rescues occurred across Ray County.

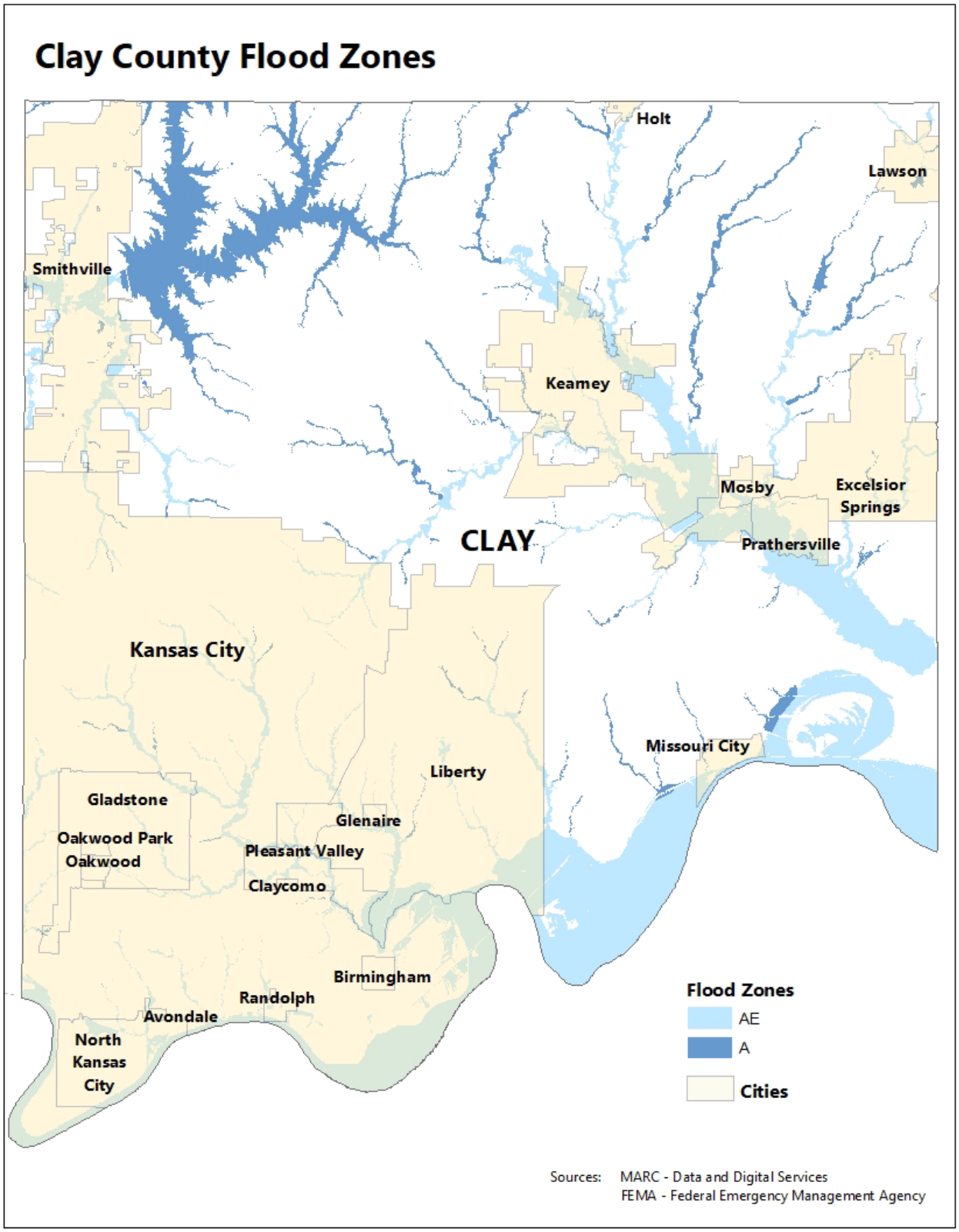
4.9.2 Probable Locations

Magnitude 25%- 50%

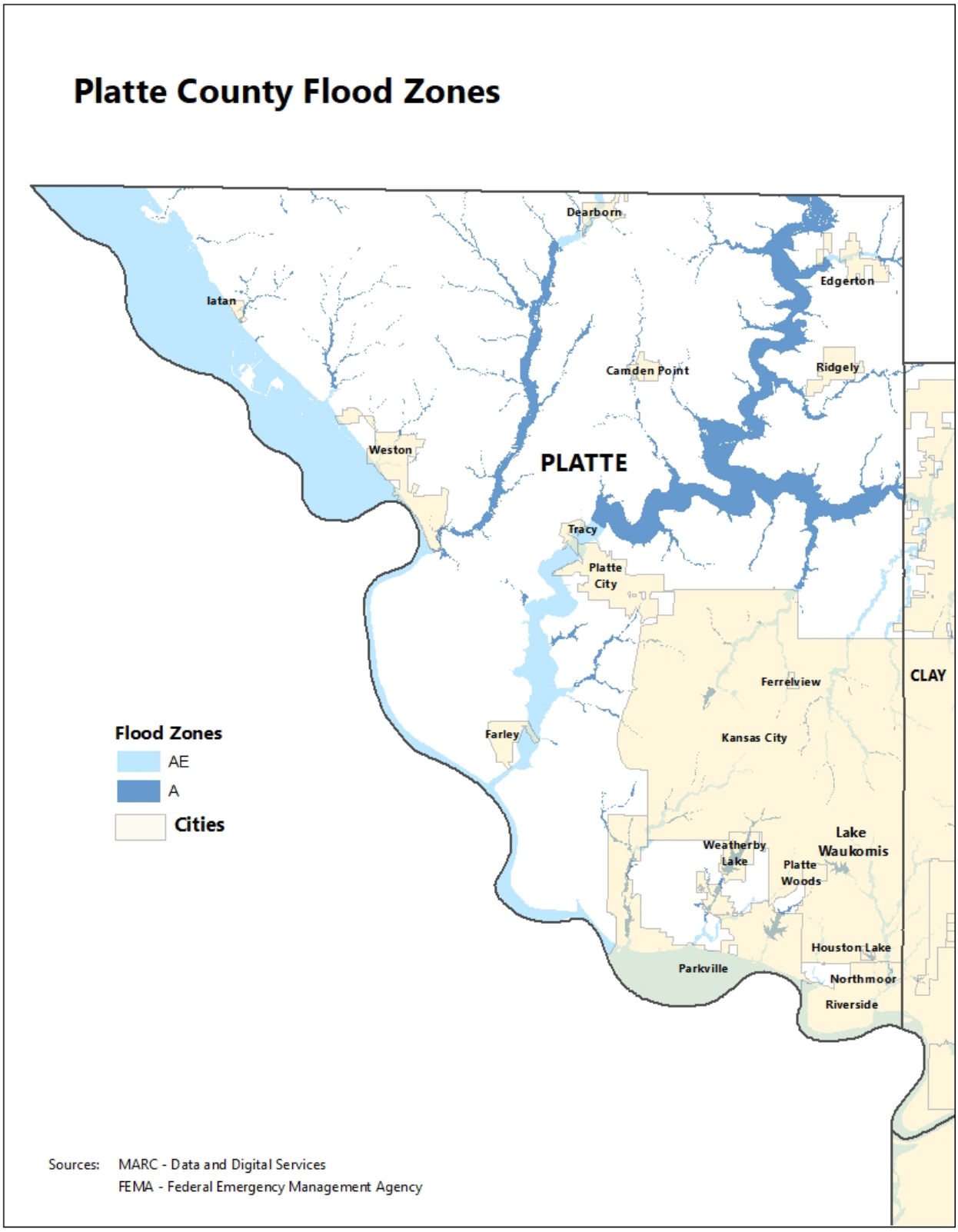
Areas in the Kansas City area most susceptible to flooding continue to include the Missouri River floodplain; areas near the Blue River in South Kansas City; Indian Creek near Red Bridge Road; portions of Martin City and South Kansas City near Red Bridge Road; the Brush Creek Basin near Highway 71; the intersection of I-35 and I-70 and adjacent surface streets; areas in the northeast, such as 9th Street, Hardesty, Gardner and Chouteau Trafficways; Southwest Boulevard and surrounding areas; State Line Road and 95th Street; Turkey Creek near 31st Street; Fairmont; and Westport. Due to flooding happening along rivers and in the floodplain, all counties were given a 35% - 50% magnitude rating.

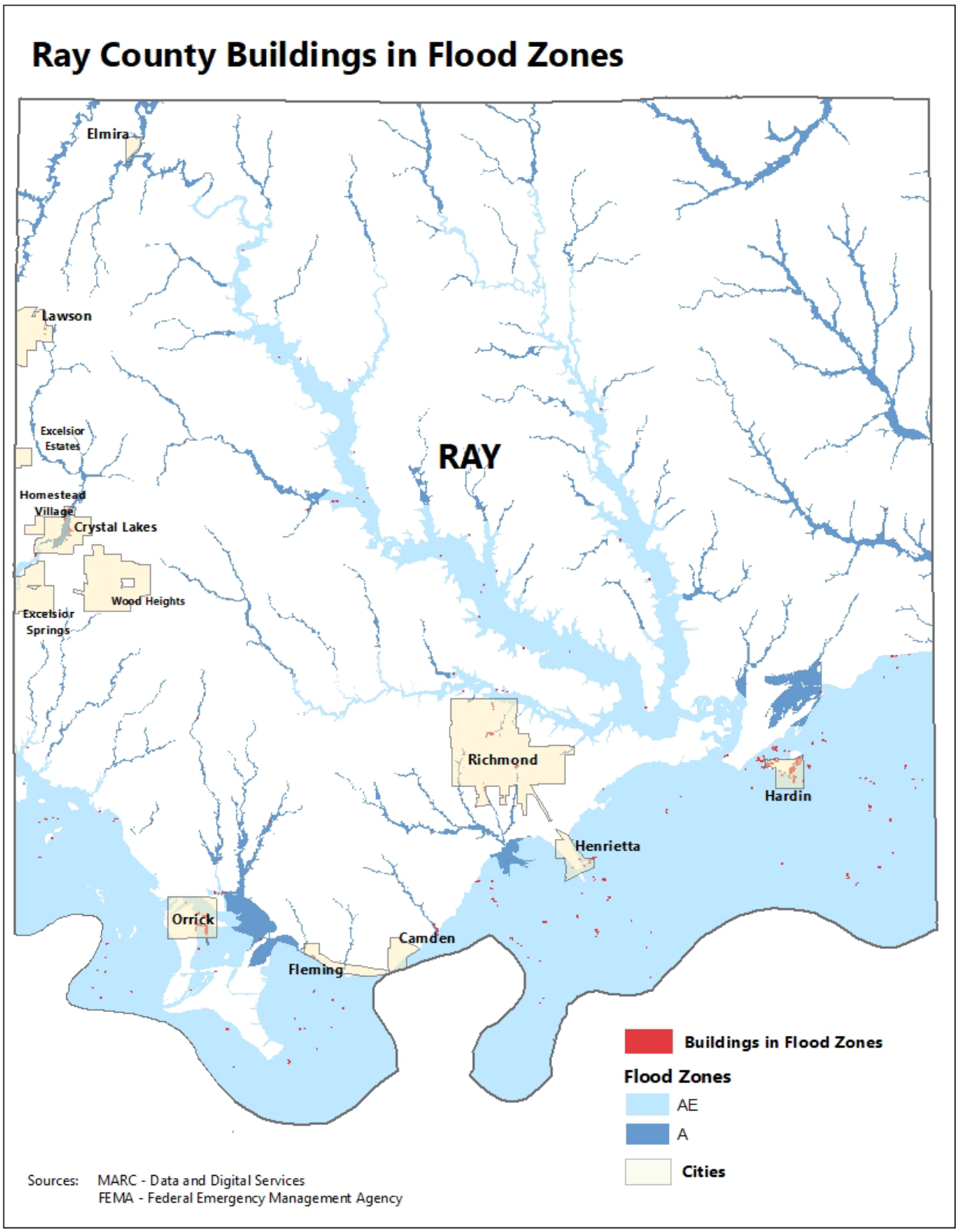
The maps below depict the flood zones in each county.


Cass County Flood Zones
Kansas City
Loch Lloyd
Belton
Raymore
Lake Winnebago
Pleasant Hill
Strasburg
Peculiar
Cleveland
Lake Annette
West Line
Freeman
Harrisonville
Garden City
CASS
Garden City
Drexel
Creighton
Archie
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Clay County Flood Zones
Holt
Lawson
Smithville
Keamey
Mosby
Excelsior Springs
CLAY
Prathersville
Kansas City
Missouri City
Liberty
Gladstone
Glenaire
Oakwood Park
Oakwood
Pleasant Valley
Claycomo
Birmingham
Randolph
Avondale
North Kansas City
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency

Jackson County Flood Zones
River Bend
Sugar Creek
Sibley
Buckner
Levasy
Independence
JACKSON
Kansas City
Blue Springs
Lake Tapawingo
Grain Valley
Oak Grove
Raytown
Unity Village
Lake Lotawana
Lee's Summit
Grandview
Lone Jack
Greenwood
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Platte County Flood Zones
Dearborn
Edgerton
Iatan
Camden Point
Ridgely
Weston
PLATTE
Tracy
Platte City
CLAY
Ferrelview
Farley
Kansas City
Lake Waukomis
Weatherby Lake
Platte Woods
Houston Lake
Parkville
Northmoor
Riverside
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Ray County Buildings in Flood Zones
Elmira
Lawson
Excelsior Estates
RAY
Homestead Village
Crystal Lakes
Wood Heights
Excelsior Springs
Richmond
Hardin
Henrietta
Orrick
Camden
Fleming
Buildings in Flood Zones
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency

4.9.3 Impact

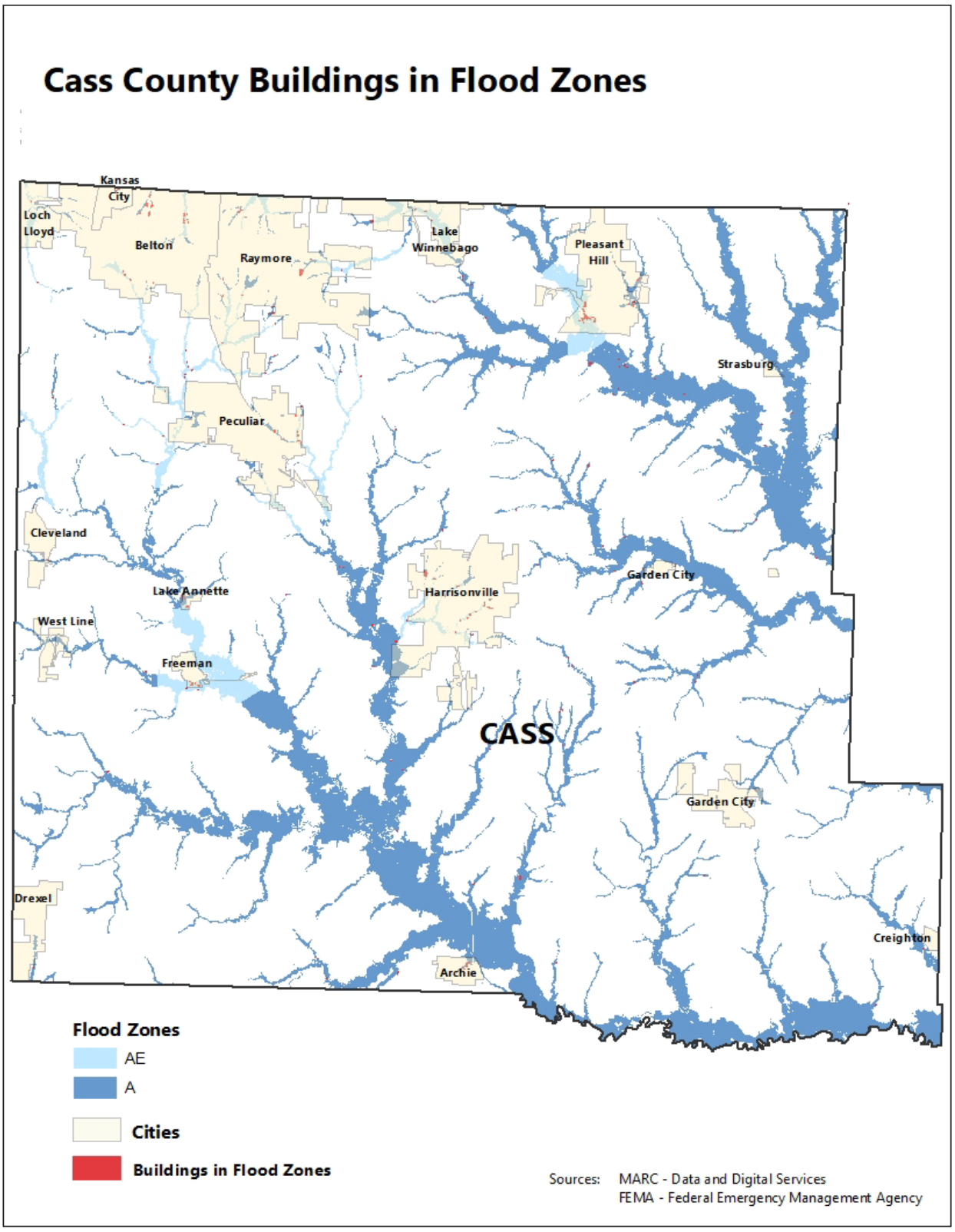
Although most flooding events cause little to no damage, there is the potential for massive loss of life and property. Since 1993, the region has suffered a cumulative total 11 deaths, $1.6 million in crop damages, and over $32 million in property damage as a result of floods, according to the National Center for Environmental Information. The damage values are estimates from the Storm Events Database and only show values that are reported. Property and crop damage values are most likely much higher than reported values.

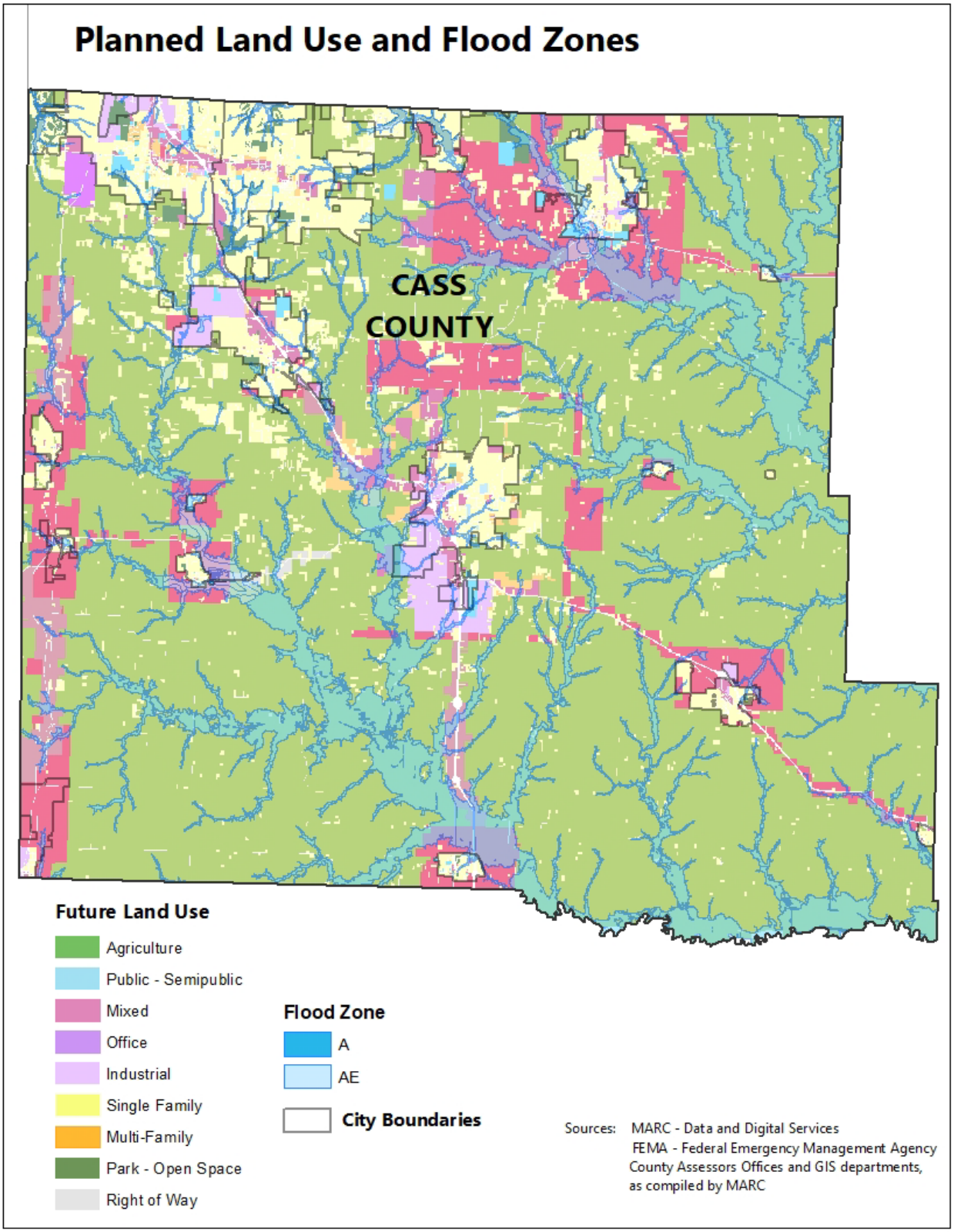
All facilities are susceptible to the hazard. Table 4.9.3 below summarizes the number and type of facilities for all counties in the floodplain.

Table 4.9.3: Number and Type of Facilities in the Floodplain

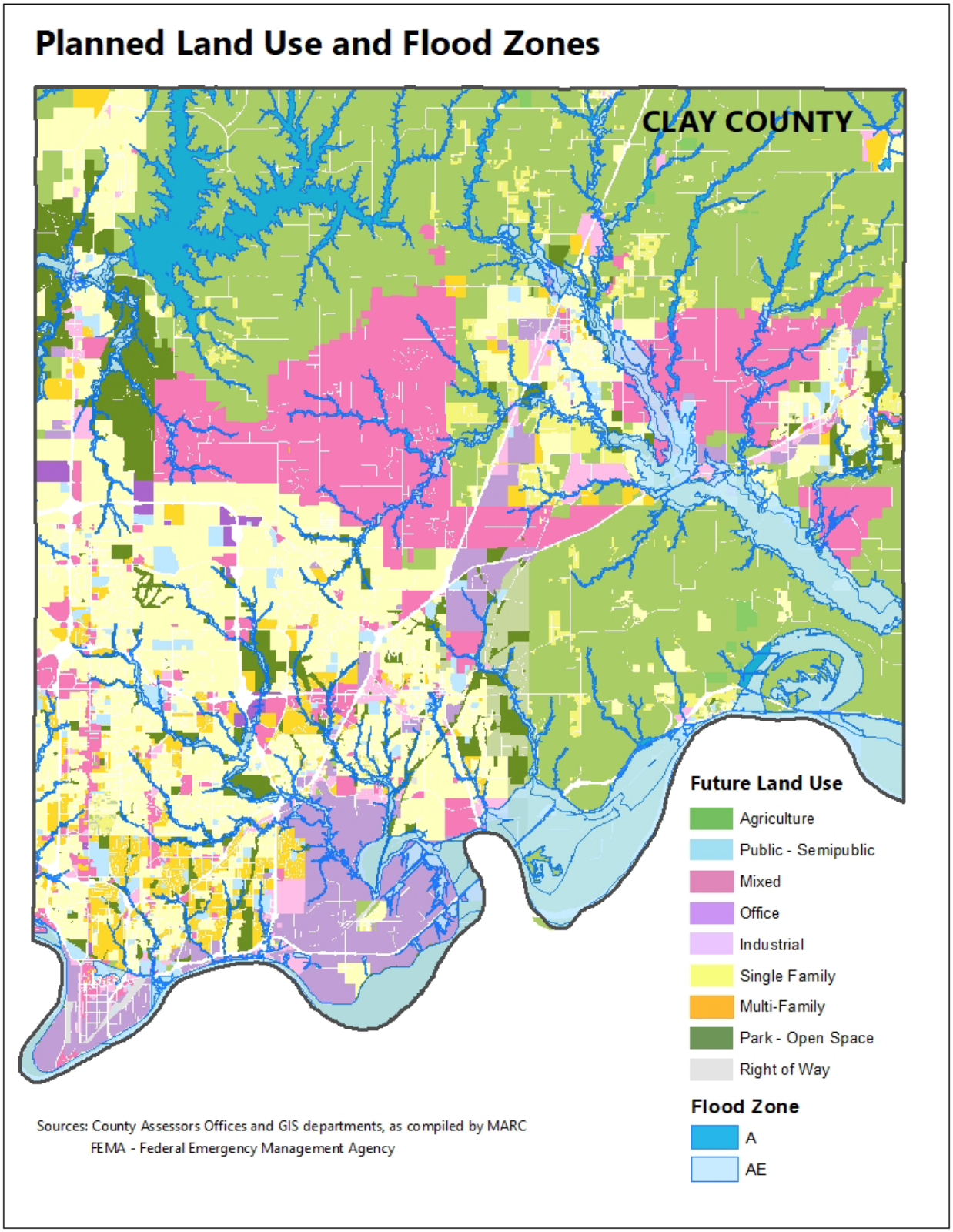
County	Buildings in Floodplain	Commercial Buildings in Floodplain	Residential Buildings in Floodplain	Other Buildings in Floodplain	Hazardous Materials in Floodplain	Types of Critical Facilities in Floodplain
Cass County	313	15	271	27	2	Dams, hazardous materials facilities, municipal buildings, police station
Clay County	663	74	313	276	72	Airports, childcare centers, dams, fire/EMS facilities, hazardous materials facilities, municipal building, police station, schools, college, nursing home
Jackson County	188	7	60	121	132	Hazardous materials facilities, fire/EMS facilities, dams, colleges, childcare centers, municipal building, police station
Platte County	262	14	131	117	26	Airports, dams, fire/EMS facilities, hazardous materials facilities, municipal building
Ray County	562	25	504	33	4	Airport, hazardous materials facilities, police station, schools, dams

The maps below depict the buildings in the flood zone and future land use areas that are in the flood zone in each county. The future land use areas represent the impact of flooding on future development.

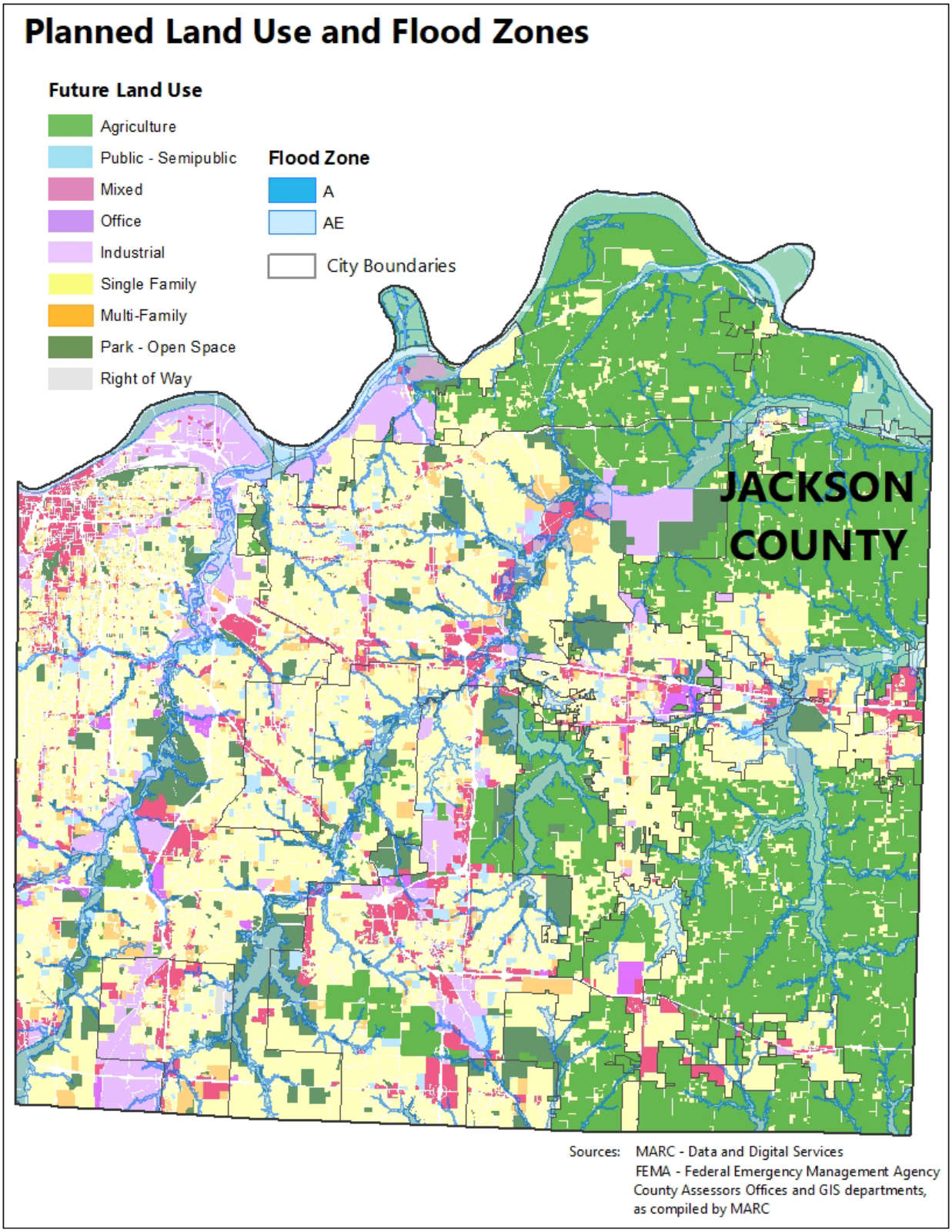


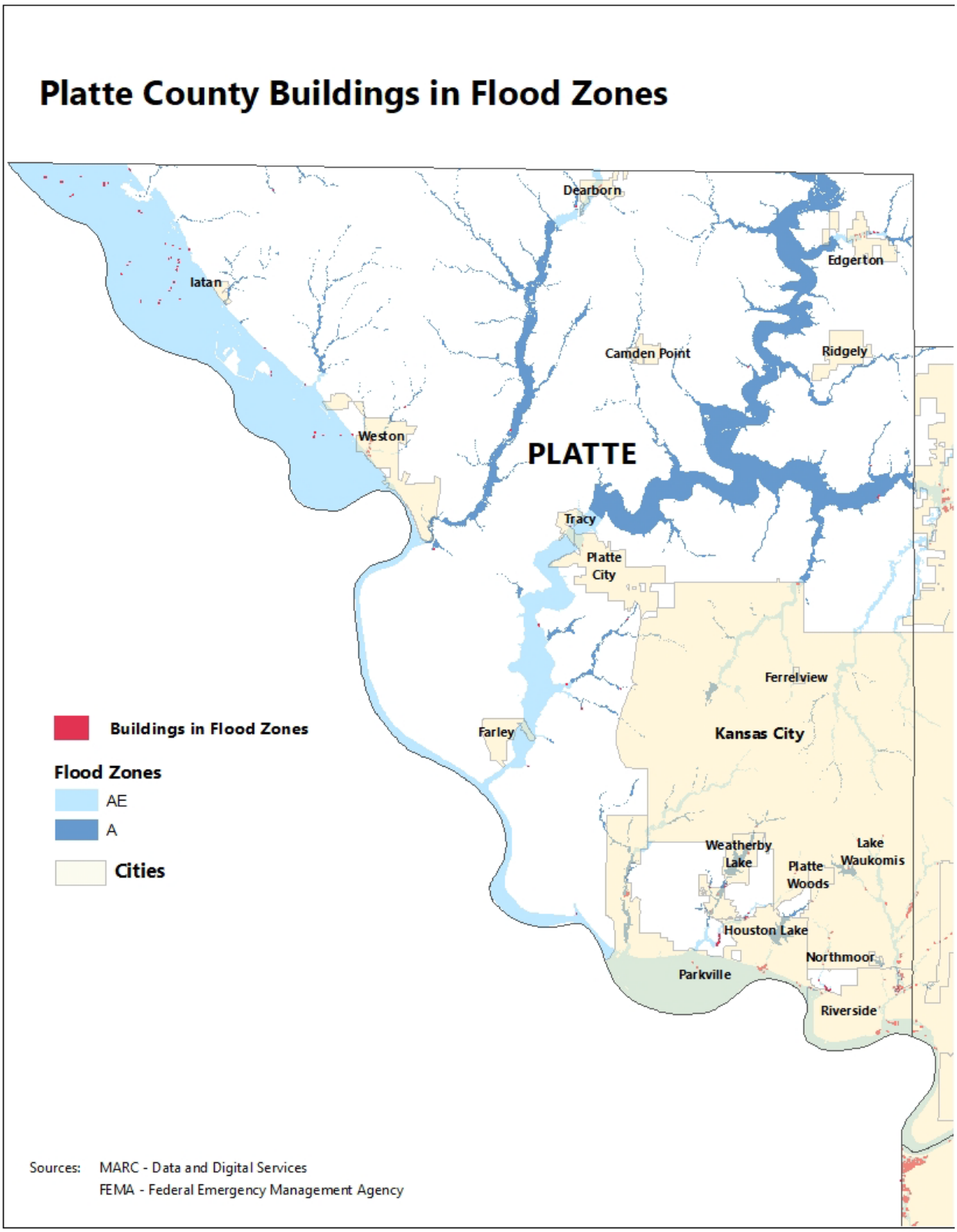

Planned Land Use and Flood Zones
CASS
COUNTY
Future Land Use
Agriculture
Public - Semipublic
Mixed
Office
Industrial
Single Family
Multi-Family
Park - Open Space
Right of Way
Flood Zone
A
AE
City Boundaries
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency
County Assessors Offices and GIS departments,
as compiled by MARC

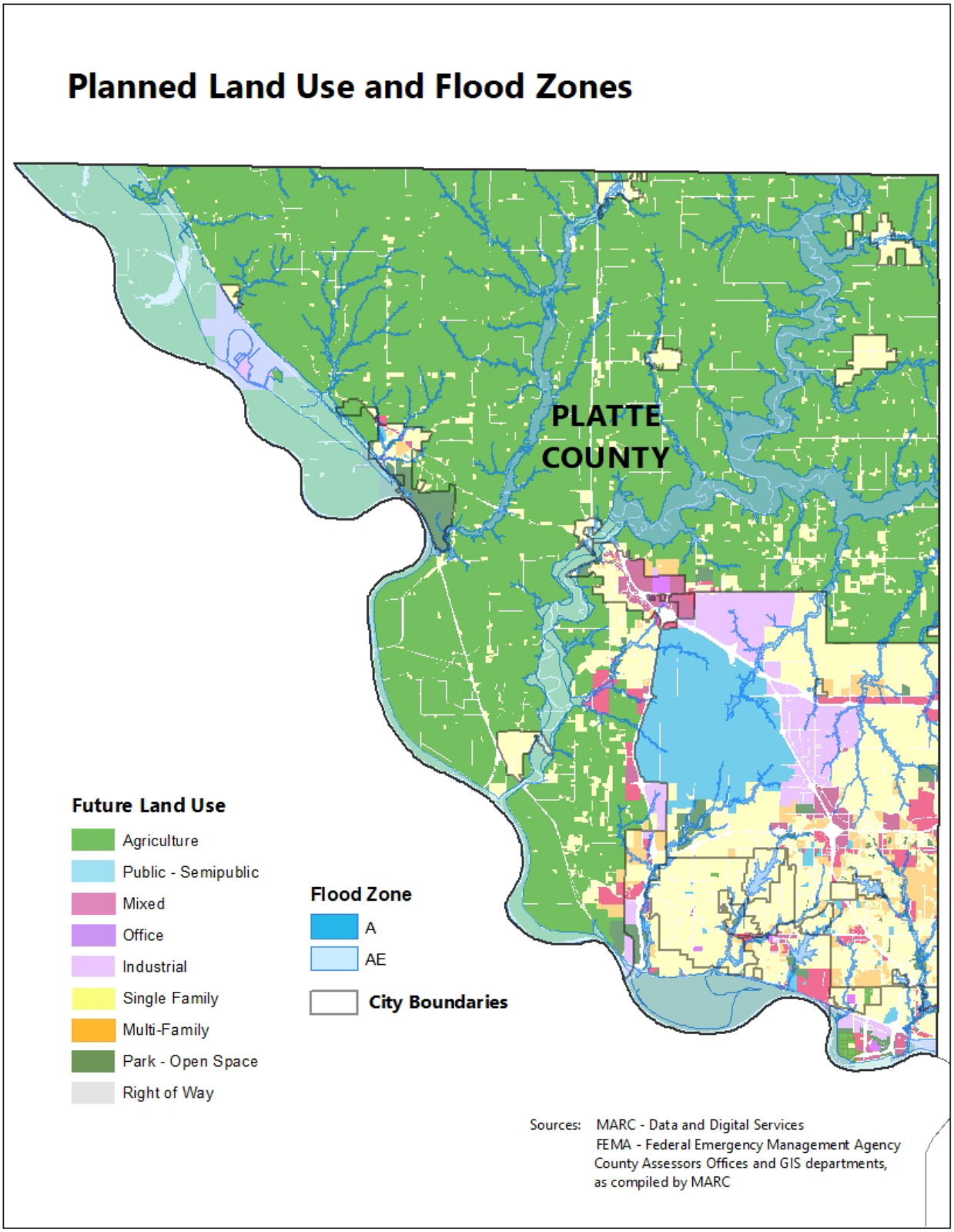
Clay County Buildings in Flood Zones
Holt
Lawson
Smithville
Kearney
Mosby
Excelsior Springs
CLAY
Prathersville
Kansas City
Missouri City
Liberty
Gladstone
Glenaire
Oakwood Park
Oakwood
Pleasant Valley
Claycomo
Birmingham
Randolph
Avondale
North Kansas City
Flood Zones
AE
A
Cities
Buildings in Flood Zones
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency

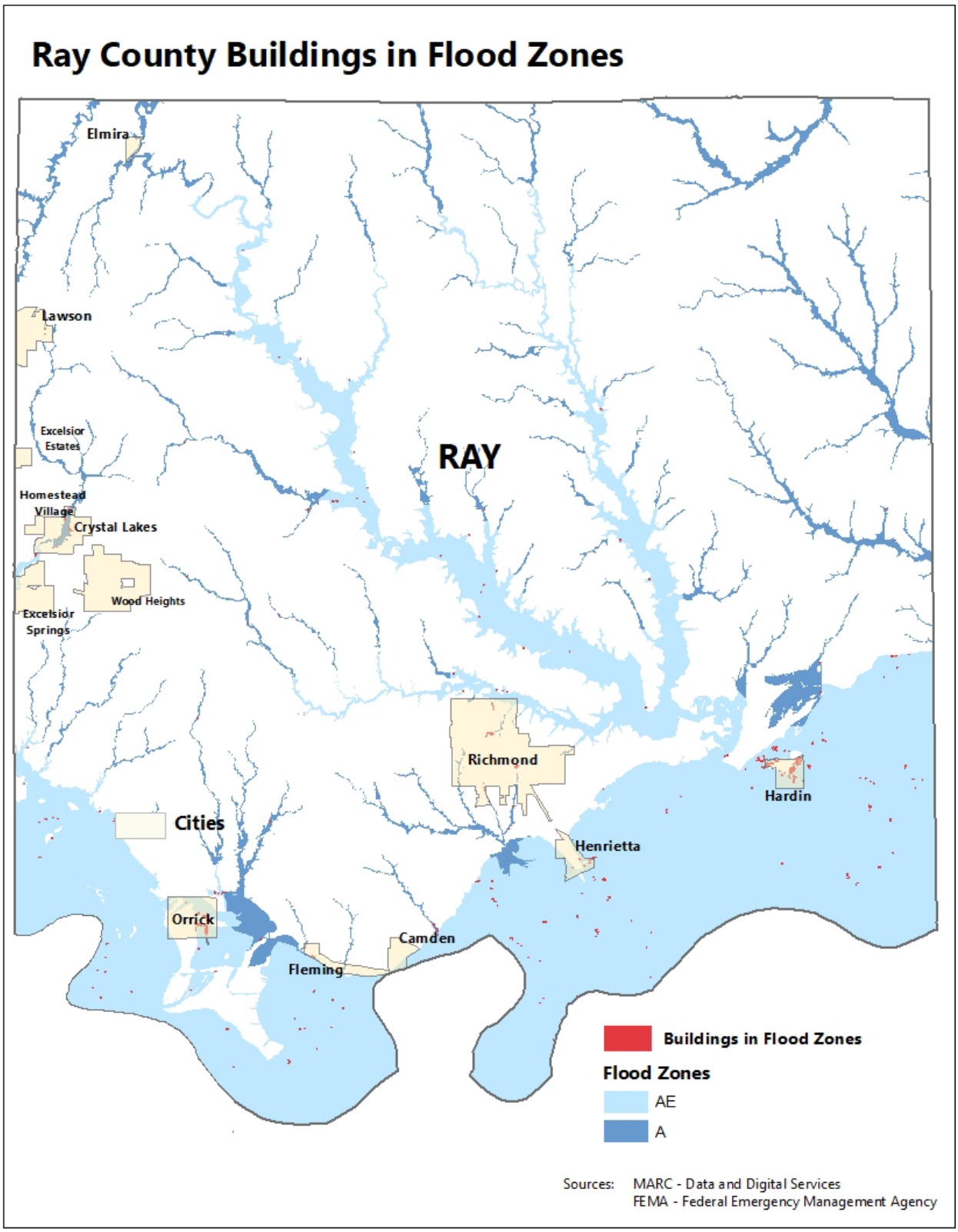

Planned Land Use and Flood Zones
CLAY COUNTY
Future Land Use
Agriculture
Public - Semipublic
Mixed
Office
Industrial
Single Family
Multi-Family
Park - Open Space
Right of Way
Flood Zone
A
AE
Sources: County Assessors Offices and GIS departments, as compiled by MARC
FEMA - Federal Emergency Management Agency

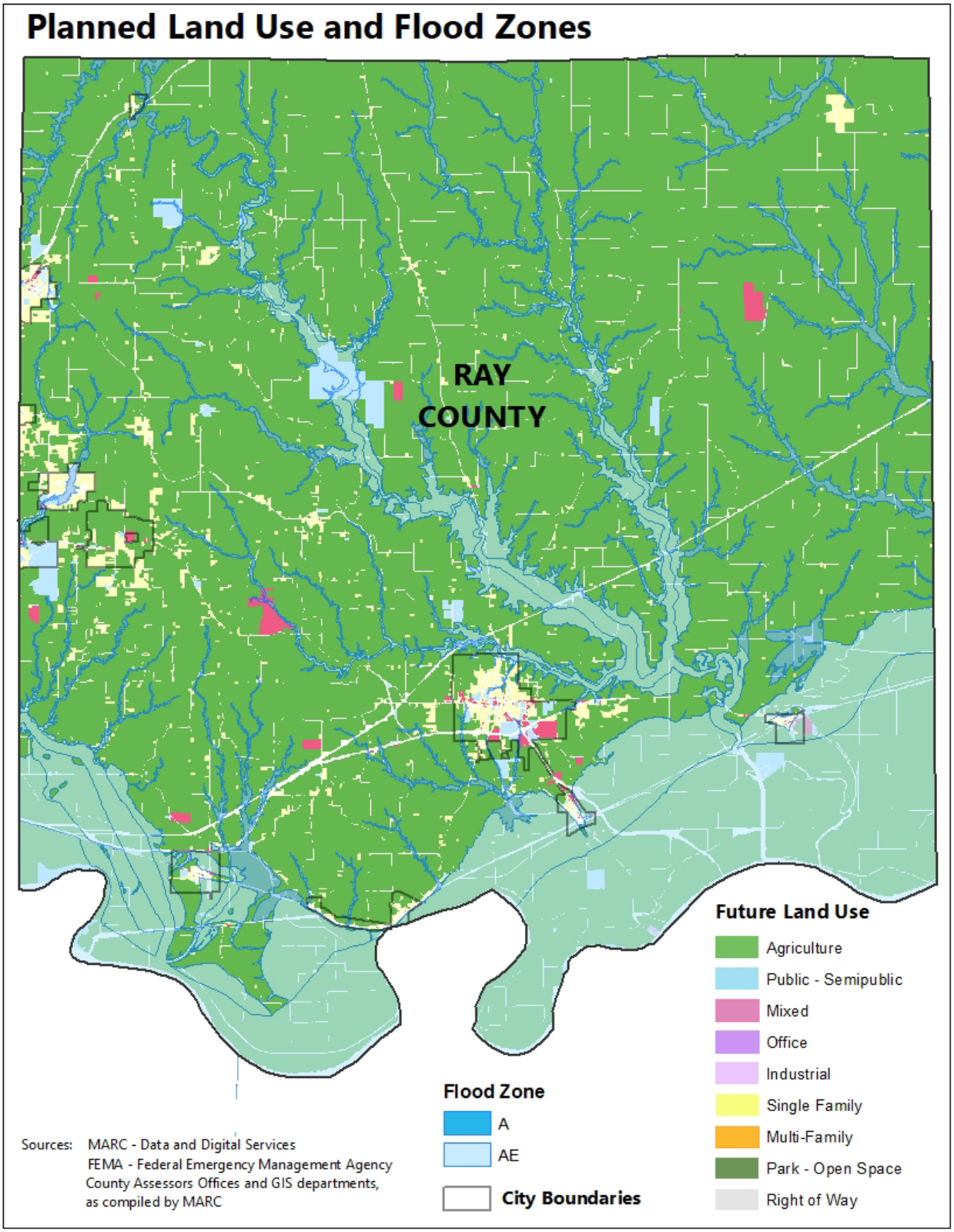
Jackson County Buildings in Flood Zones
Rive
Bend
Sugar
Creek
Sibley
Buckner
Levasy
Independence
JACKSON
Kansas City
Blue Springs
Lake
Tapawingo
Grain
Valley
Oak
Grove
Raytown
Unity Village
Lake
Lotawana
Lee's Summit
Grandview
Lone Jack
Greenwood
Flood Zones
AE
A
Cities
Buildings in Flood Zones
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Planned Land Use and Flood Zones
Future Land Use
Agriculture
Public - Semipublic
Mixed
Office
Industrial
Single Family
Multi-Family
Park - Open Space
Right of Way
Flood Zone
A
AE
City Boundaries
JACKSON COUNTY
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency
County Assessors Offices and GIS departments, as compiled by MARC


Platte County Buildings in Flood Zones
Dearborn
Edgerton
Iatan
Camden Point
Ridgely
Weston
PLATTE
Tracy
Platte City
Ferrelview
Buildings in Flood Zones
Farley
Kansas City
Flood Zones
AE
A
Cities
Weatherby Lake
Lake Waukomis
Platte Woods
Houston Lake
Northmoor
Parkville
Riverside
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Planned Land Use and Flood Zones
PLATTE COUNTY
Future Land Use
Agriculture
Public - Semipublic
Mixed
Office
Industrial
Single Family
Multi-Family
Park - Open Space
Right of Way
Flood Zone
A
AE
City Boundaries
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency
County Assessors Offices and GIS departments,
as compiled by MARC


Ray County Buildings in Flood Zones
Elmira
Lawson
Excelsior Estates
RAY
Homestead Village
Crystal Lakes
Wood Heights
Excelsior Springs
Richmond
Hardin
Cities
Henrietta
Orrick
Camden
Fleming
Buildings in Flood Zones
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Planned Land Use and Flood Zones
RAY
COUNTY
Future Land Use
Agriculture
Public - Semipublic
Mixed
Office
Industrial
Single Family
Multi-Family
Park - Open Space
Right of Way
Flood Zone
A
AE
City Boundaries
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency
County Assessors Offices and GIS departments,
as compiled by MARC

4.9.4 Probability of Future Occurrence: 100%*

*It is unrealistic to assure a 100 percent chance of any hazard happening in a given year. However, based on occurrences in the past 28 years, there has been a flood or flash flood every year.

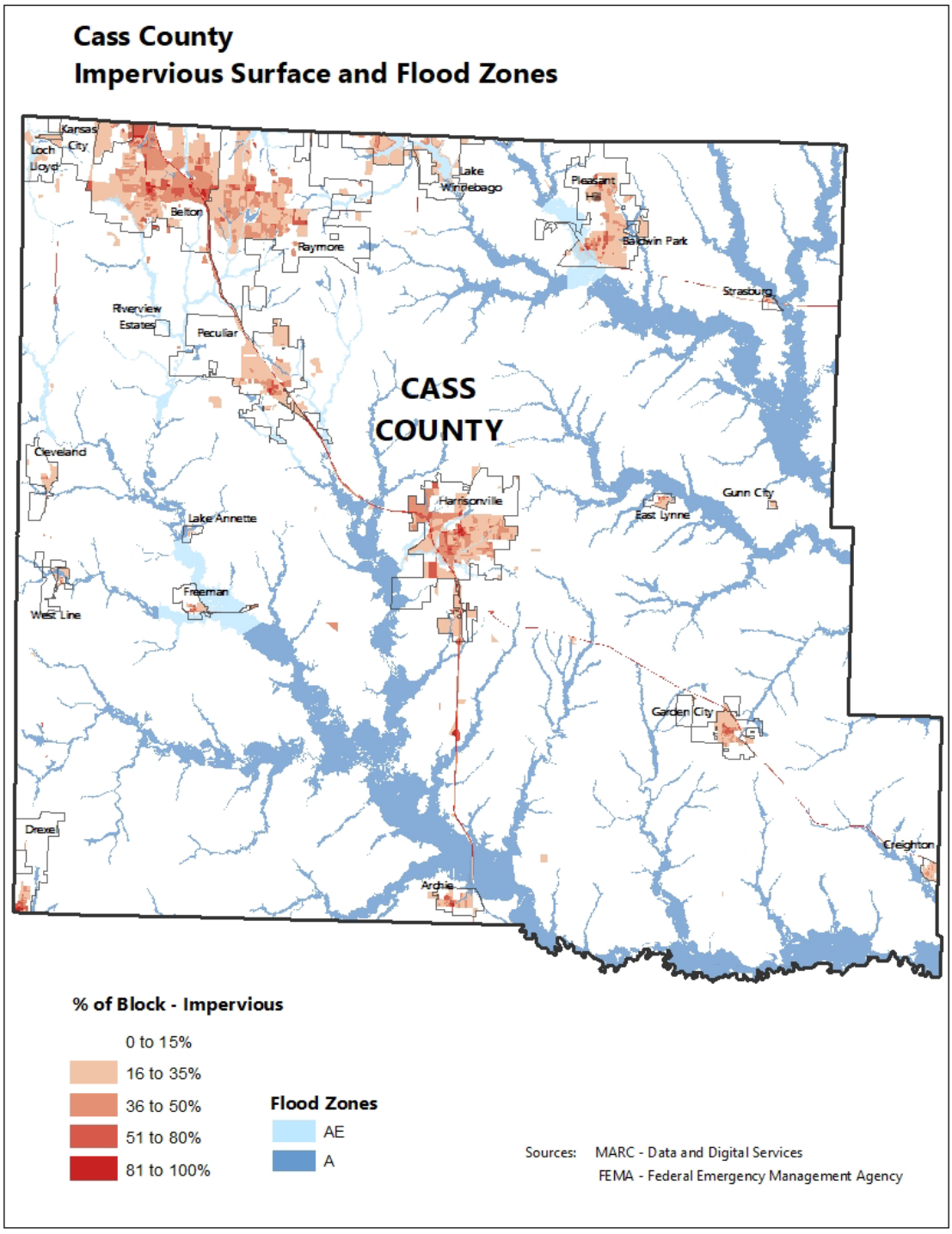
Seasonal Pattern: The most likely cause of flooding is heavy rainfall. In the Kansas City area, May, June, July and September receive the highest average monthly rainfall amounts. Consequently, the risk of flooding may be greatest in these months.

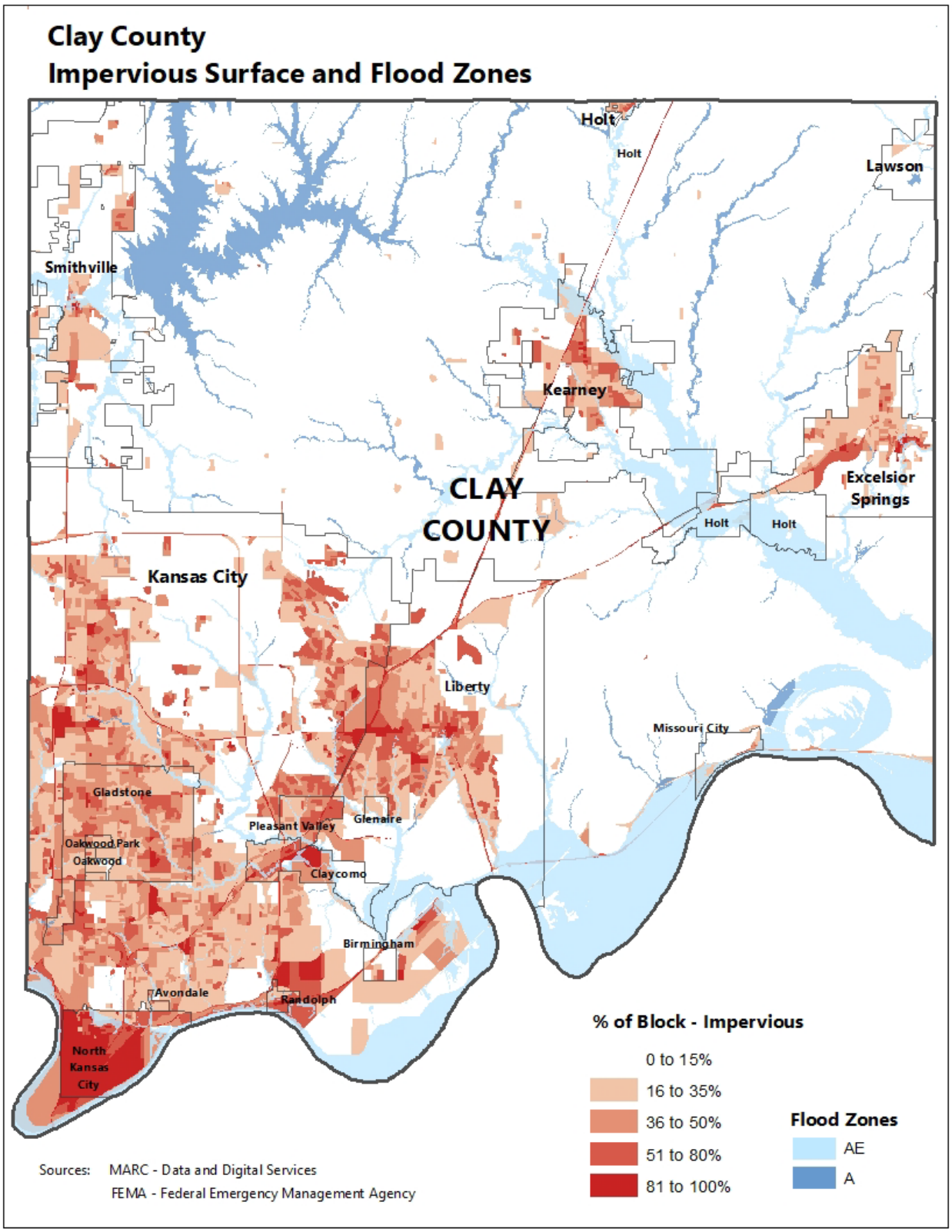
A recent study by Anderson and Walker found that recent and projected increases in annual precipitation for Kansas City are substantial, with concentrated seasonal rainfall during extreme events for both spring and fall, while the length of consecutive dry days will increase substantially in summer months.

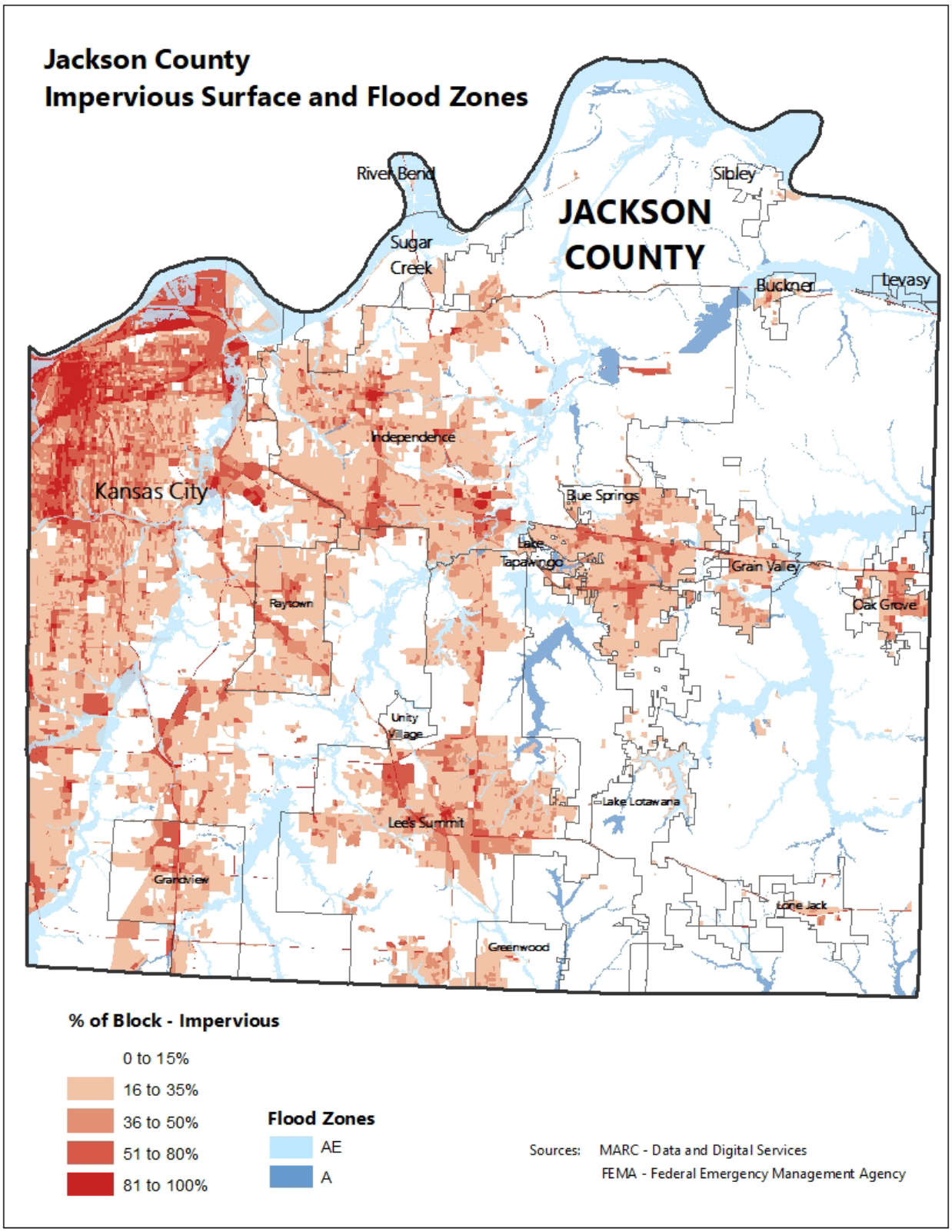
- Average annual precipitation will increase from 38.8 to 44.6 inches/year.
- Maximum precipitation occurring over one day will increase from 3.4 to 4.0 inches. Increases for the maximum five- and 15-day precipitation will be from 5.5 to 7.0 inches and from 7.5 to 10.4 inches, respectively.
- The number of days with more than 1.5” of precipitation will increase from 5.0 to 9.3.
- The maximum number of consecutive dry days will increase from 30.9 days/year to 39.5 days/year.

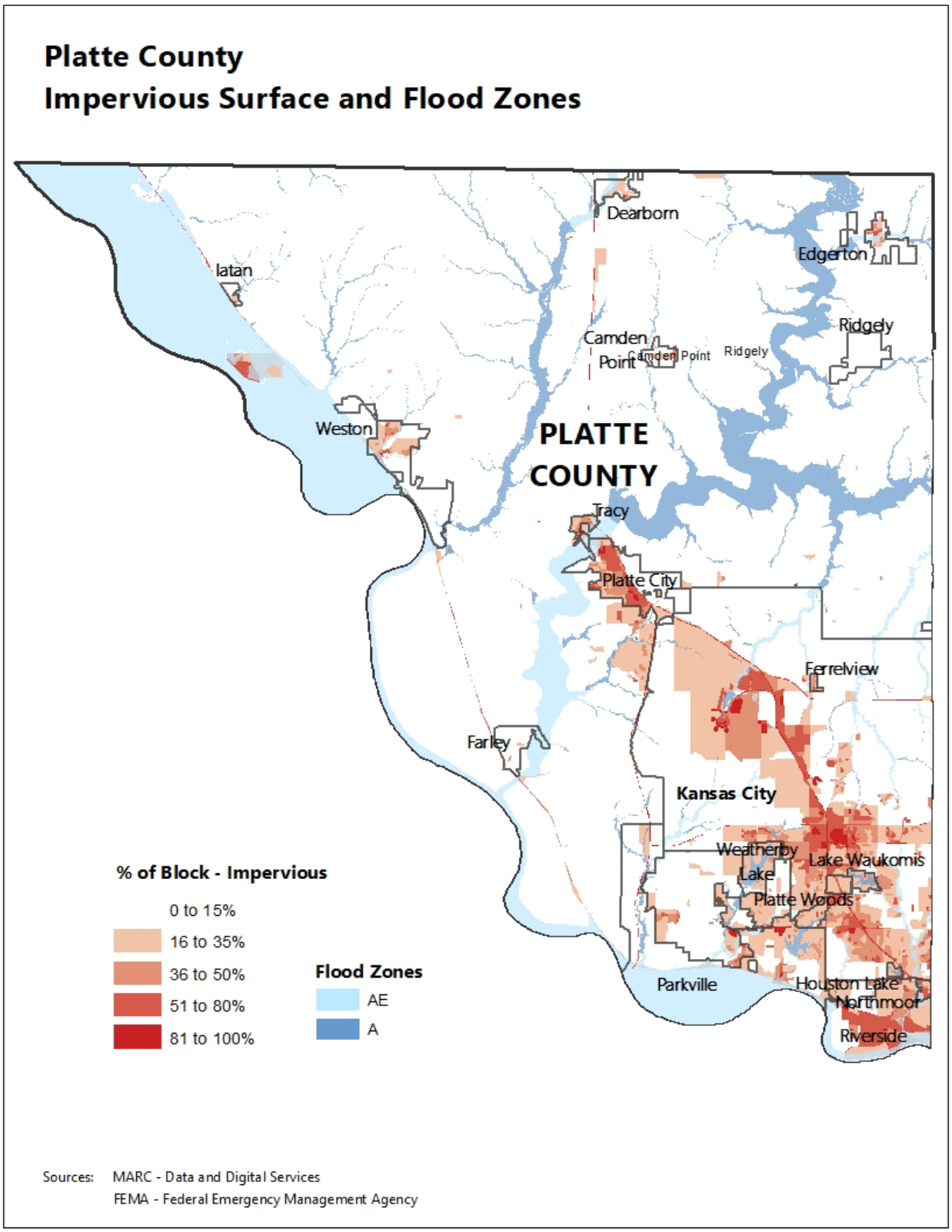
4.9.5 Vulnerability Analysis and Potential Loss Estimates by County

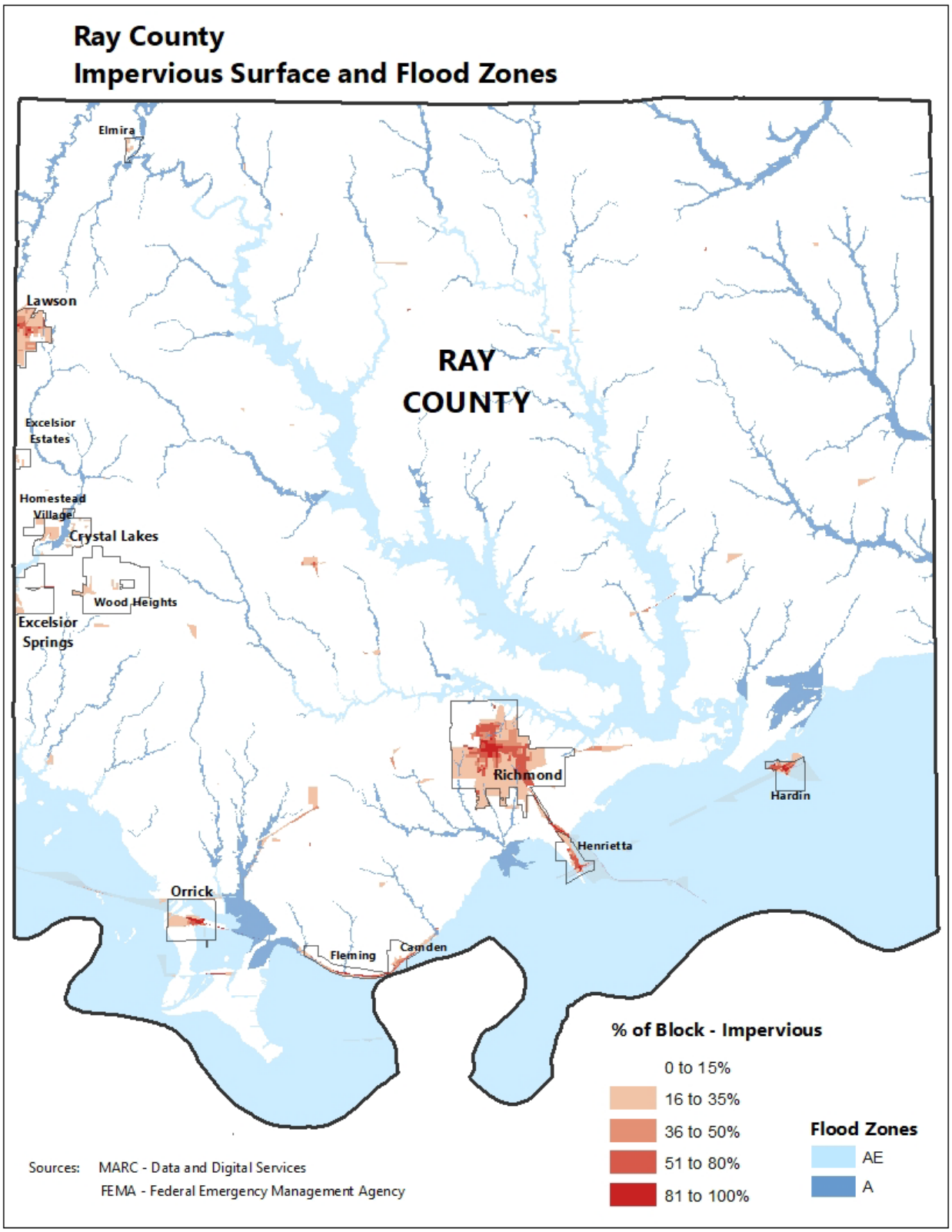
As cities grow and more development occurs, the natural landscape is replaced by roads, buildings, housing developments, and parking lots. Studies have shown that as development and the amount of impervious surfaces increases in a watershed, severe flood events happen more often. The following map depict the impervious areas in each county in the planning area.




Clay County
Impervious Surface and Flood Zones
Holt
Holt
Lawson
Smithville
Kearney
CLAY
COUNTY
Excelsior
Springs
Holt
Holt
Kansas City
Liberty
Missouri City
Gladstone
Pleasant Valley
Glenaire
Oakwood Park
Oakwood
Claycomo
Birmingham
Avondale
Randolph
North
Kansas
City
% of Block - Impervious
0 to 15%
16 to 35%
36 to 50%
51 to 80%
81 to 100%
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Jackson County
Impervious Surface and Flood Zones
JACKSON COUNTY
River Bend
Sibley
Sugar Creek
Buckner
Levasy
Independence
Kansas City
Blue Springs
Lake Tapawingo
Gran Valley
Oak Grove
Raytown
Unity Village
Lake Lotawana
Lees Summit
Grandview
Lone Jack
Greenwood
% of Block - Impervious
0 to 15%
16 to 35%
36 to 50%
51 to 80%
81 to 100%
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Platte County
Impervious Surface and Flood Zones
Dearborn
Edgerton
Iatan
Ridgely
Camden Point
Camden Point
Ridgely
Weston
PLATTE COUNTY
Tracy
Platte City
Ferrelview
Farley
Kansas City
Weatherby Lake
Lake Waukomis
Platte Woods
Parkville
Houston Lake
Northmoor
Riverside
% of Block - Impervious
0 to 15%
16 to 35%
36 to 50%
51 to 80%
81 to 100%
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Ray County
Impervious Surface and Flood Zones
RAY
COUNTY
Elmira
Lawson
Excelsior
Estates
Homestead
Village
Crystal Lakes
Wood Heights
Excelsior
Springs
Richmond
Hardin
Henrietta
Orrick
Fleming
Camden
% of Block - Impervious
0 to 15%
16 to 35%
36 to 50%
51 to 80%
81 to 100%
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency

In 2023, the state of Missouri (SEMA) updated their 2019 Hazard Mitigation Plan assessing hazards and risk for all counties in Missouri. Data for flooding was produced and provided by SEMA. SEMA's methodology estimation for the 2023 Missouri State Hazard Mitigation Plan is excerpted below. Table 4.9.4 and 4.9.5 show the total direct building loss and income loss for Cass, Clay, Jackson, Platte, and Ray. Table and figure numberings have been changed to correspond to sequencing in this Plan.

State Estimates of Potential Losses[xvii]

The intent of this analysis was to enable the State to estimate where flood losses could occur and the degree of severity using a consistent methodology. The statewide analysis used best available data; that is, digital effective FIRM data coupled with LiDAR derived building footprints. The computer models help quantify risk along known flood-hazard corridors such as along the Mississippi and Missouri Rivers. In addition, flood losses are estimated for certain lesser streams and rivers where the flood hazard may not have been previously studied.

The Hazus analysis provides the number of buildings impacted, estimates of the building repair costs, and the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community as a whole by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by Hazus using a methodology based on the building damage estimates.

Flood damage is directly related to the depth of flooding. For example, a two-foot-deep flood generally results in about 20 percent damage to the structure (which translates to 20 percent of the structure's replacement value). Hazus takes into account flood depth when modeling damage (based on FEMA's depth damage functions). Hazus reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes in Hazus include agriculture, commercial, education, government, industrial, religion, and residential. Damage percent classes are grouped by 10 percent increments: 1-10 percent, 11-20 percent, etc., up to 50 percent. Buildings that sustain more than 50 percent damage are considered to be substantially damaged.

The displaced population is based on the inundation area. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated (i.e., a warning was issued) or there was no physical access to the property because of flooded roadways. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. Age plays a secondary role in shelter use in that there are some individuals who will go to a public shelter even if they have the financial means to go elsewhere. These will usually be younger, less established families and elderly families (Hazus User's Manual). Hazus does not model flood casualties given that flood-related deaths and injuries typically do not have the same significant impact on the medical infrastructure as those associated with earthquakes.

- **Direct building losses** are calculated within Hazus from US Census data.

Loss ratio of the direct building losses compared to overall building inventory - The loss ratio of the direct building losses compared to overall building inventory per county gives an indication of the severity of impacts on community sustainability. While a large urban area may have the greatest dollar losses, it may be able to absorb the impact better than a more rural area where a flood could impact a significant amount of the infrastructure in the entire county.

- **Count of Residential Buildings Exposed to Flooding (MSDIS)** – To determine the number of residential buildings exposed to the 1-percent annual chance flood event, the MSDIS dataset was intersected with the depth grids outside of the Hazus environment. This provides an indication of the potential magnitude of a flood event. This exposure count was updated for 18 counties using the draft datasets available from the SEMA CTP Mapping Program.

- **Count of Residential Buildings Potentially Damaged by Flooding (Hazus)** – To determine the number of damaged residential structures, the analysis performed within Hazus utilized US Census data to estimate the number of residential structures which are at risk of damage and the number expected to receive substantial damage during a 1-percent annual chance flood event. Note, there are instances where the Hazus analysis predicted a greater number of damaged buildings than were identified with the exposed MSDIS points. This is due a fundamental premise of the Hazus Level 1 flood loss methodology that the buildings are uniformly distributed within census blocks.

- **Income losses, Population displaced by the flood, and Shelter** needs – all computed within Hazus from US Census data.

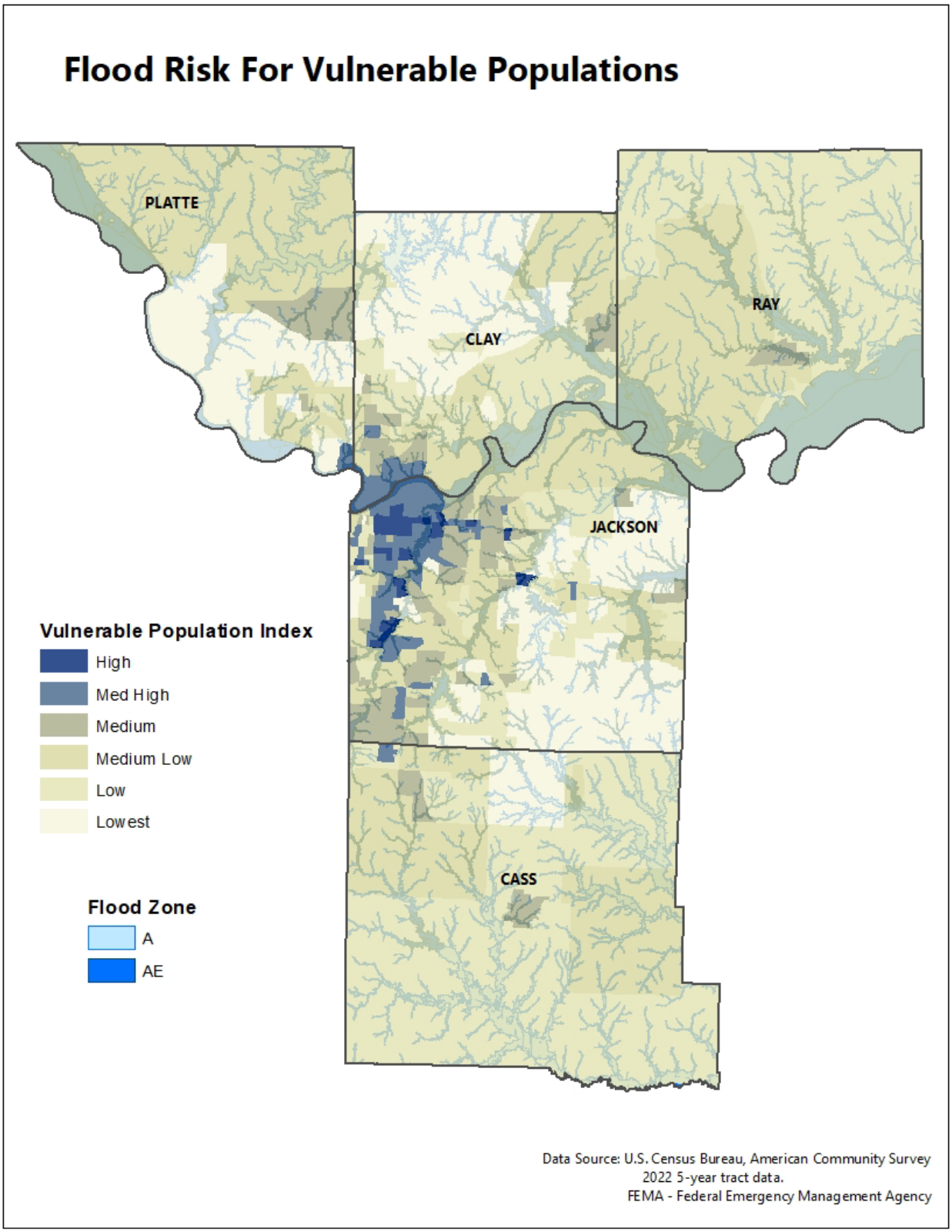
Table 4.9.4: Direct Building Loss and Income Loss					
	Cass	**Clay**	**Jackson**	**Platte**	**Ray**
Countywide Building Exposure	$13, 279, 914, 156	$33,542,252,386	$108,581,199,794	$13,811,465,341	$3,084,500,793
Structural Damage	$65,030,858	$201,154,453	$896,418,928	$92,964,620	$42,510,964
Loss Ratio	0.49%	0.60%	0.83%	0.67%	1.38%
Contents Loss	$46,918,167	$161,383,856	$1,269,692,575	$90,962,230	$34,319,039
Inventory Loss	$1,107,576	$3,393,242	$64,894,690	$3,351,906	$761,078
Total Direct Loss	$113,056,600	$365,931,551	$2,231,006,194	$187,278,755	$77,591,081
Total Income Loss	$173,857	$842,536	$13,666,583	$741,626	$218,840
Total Direct and Income Loss	**$113,230,457**	**$366,774,087**	**$2,244,672,777**	**$188,020,381**	**$77,809,922**
#Hazus UDF damaged structures	239	695	1,264	255	289
# Substantially Damaged	1	204	380	15	0
# Displaced People	2,878	4,992	7,075	1,709	2,034
# Shelter Needs	897	2,989	4,426	794	712

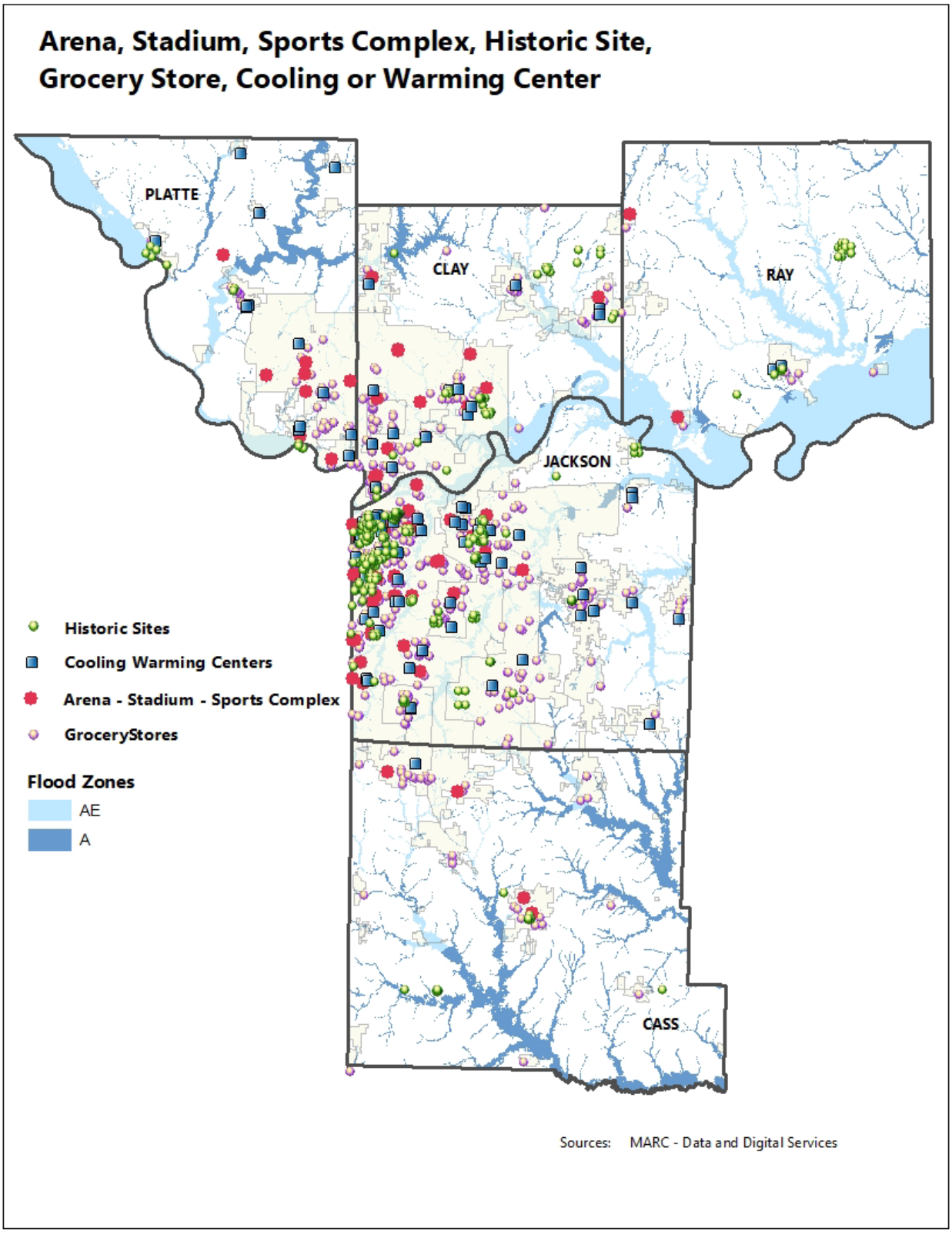
Note: Column headers in dark blue refer to computation within Hazus; column headers in light blue refer to computations performed outside of the Hazus environment.
Source: MO State hazard Mitigation Plan, Flooding, page 3.69-3.71

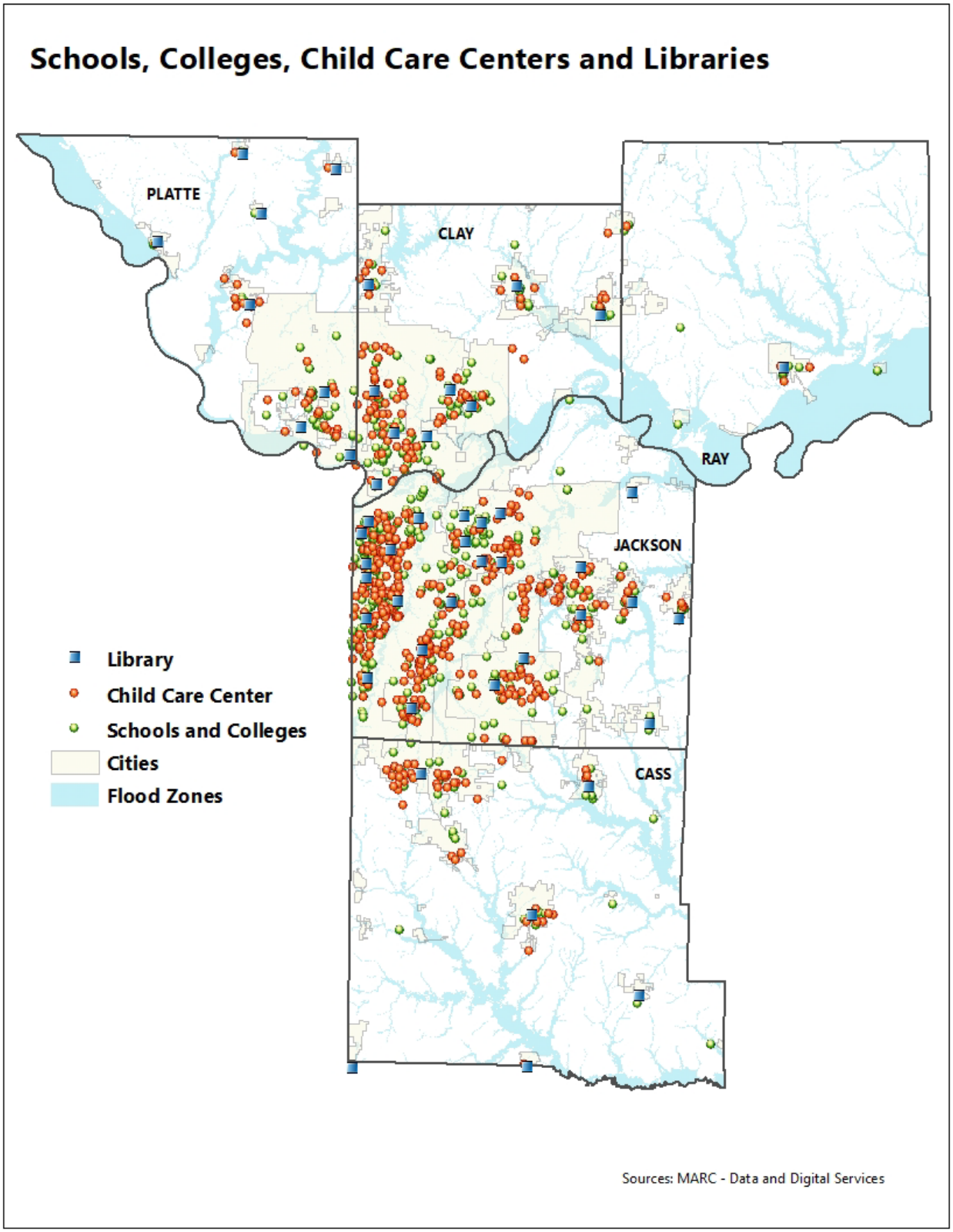
Table 4.9.5: Direct Building Loss and Income Loss						
		Cass	**Clay**	**Jackson**	**Platte**	**Ray**
Residential	# Residential Structures	162	551	1,123	181	318
	Total $$ of Loss	$50,718,733	$183,637,947	$361,402,825	$67,728,912	$87,699,243
Agriculture	# Agriculture Structures	264	192	218	109	502
	Total $$ of Loss	$86,846,275	$54,891,063	$76,983,335	$33,047,061	$222,315,498
Commercial	# Commercial Structures	67	143	1,095	82	22
	Total $$ of Loss	$44,417,950	$183,668,088	$1,479,301,745	$86,757,405	$14,868,684
Education	# Education Structures	0	1	2	0	0
	Total $$ of Loss	$0	$2,345,440	$5,403,213	$	$0
Government	# Government Structures	0	14	1	26	4
	Total $$ of Loss	$0	$19,085,373	$1,738,437	$37,513,793	$3,378,321
$10,671,314Industrial	# Industrial Structures	27	65	598	42	11
	Total $$ of Loss	$14,971,689	$88,084,432	$865,030,631	46,042,048	$10,671,314
Total # Population Affected		**418**	**1,449**	**2,684**	**460**	**811**
Total Loss- Hazus Layer		**$196,954,647**	**$531,712,343**	**$2,789,860,185**	**$271,089,219**	**$338,933,060**

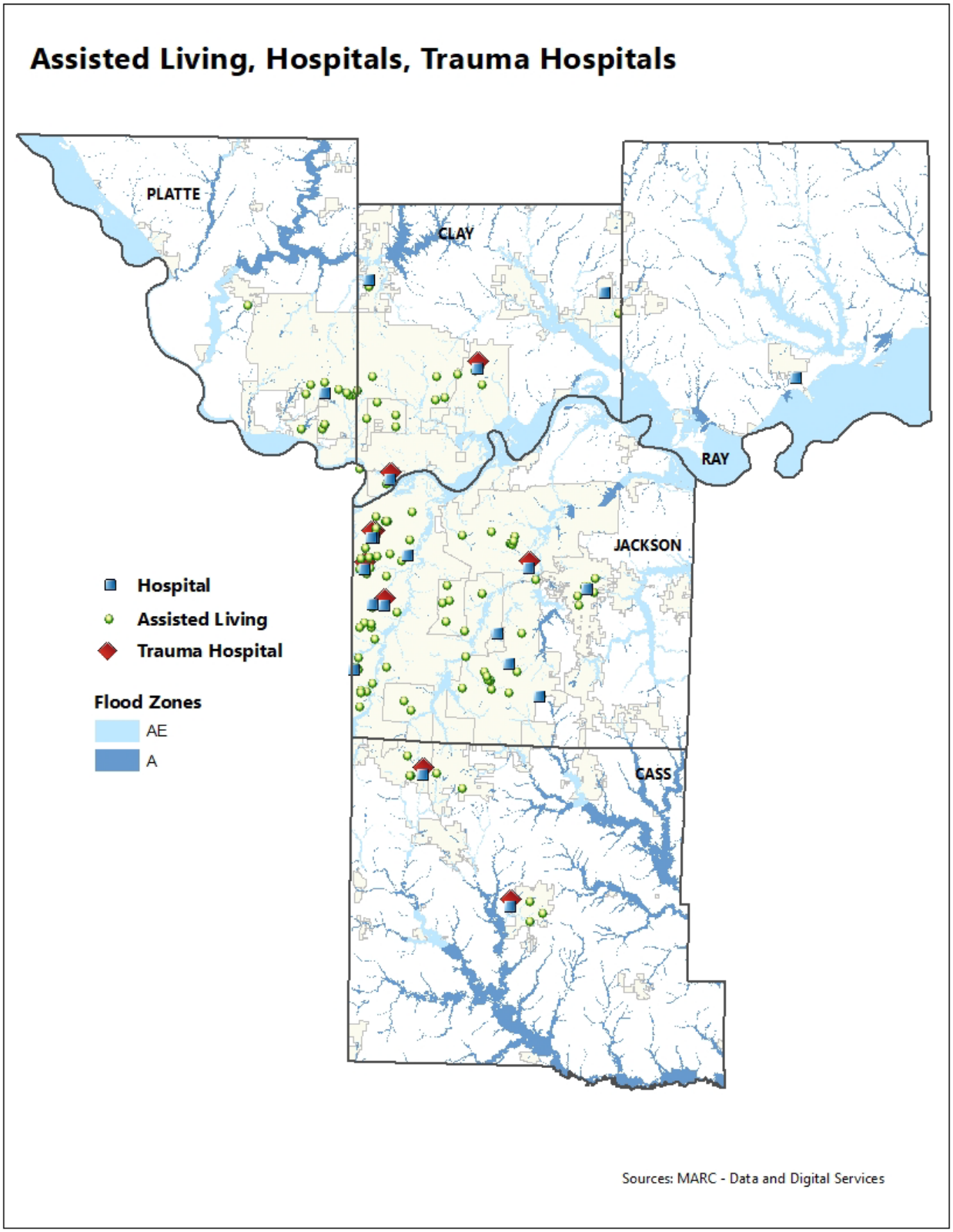
Source: Missouri State Hazard Mitigation Plan, pg. 3.72-3.75

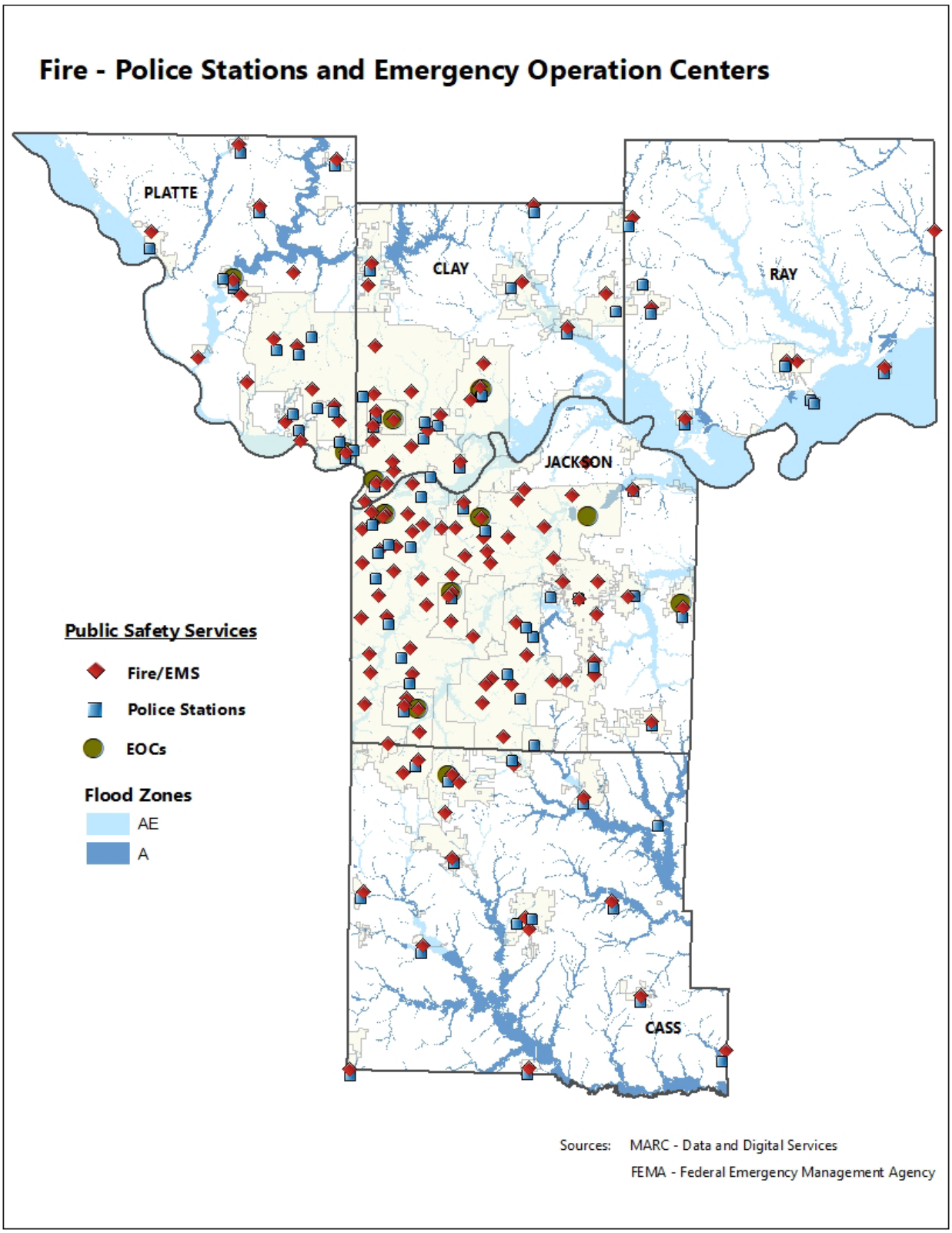
The following maps depict the key assets, including vulnerable populations, that may be vulnerable to flooding in the region.

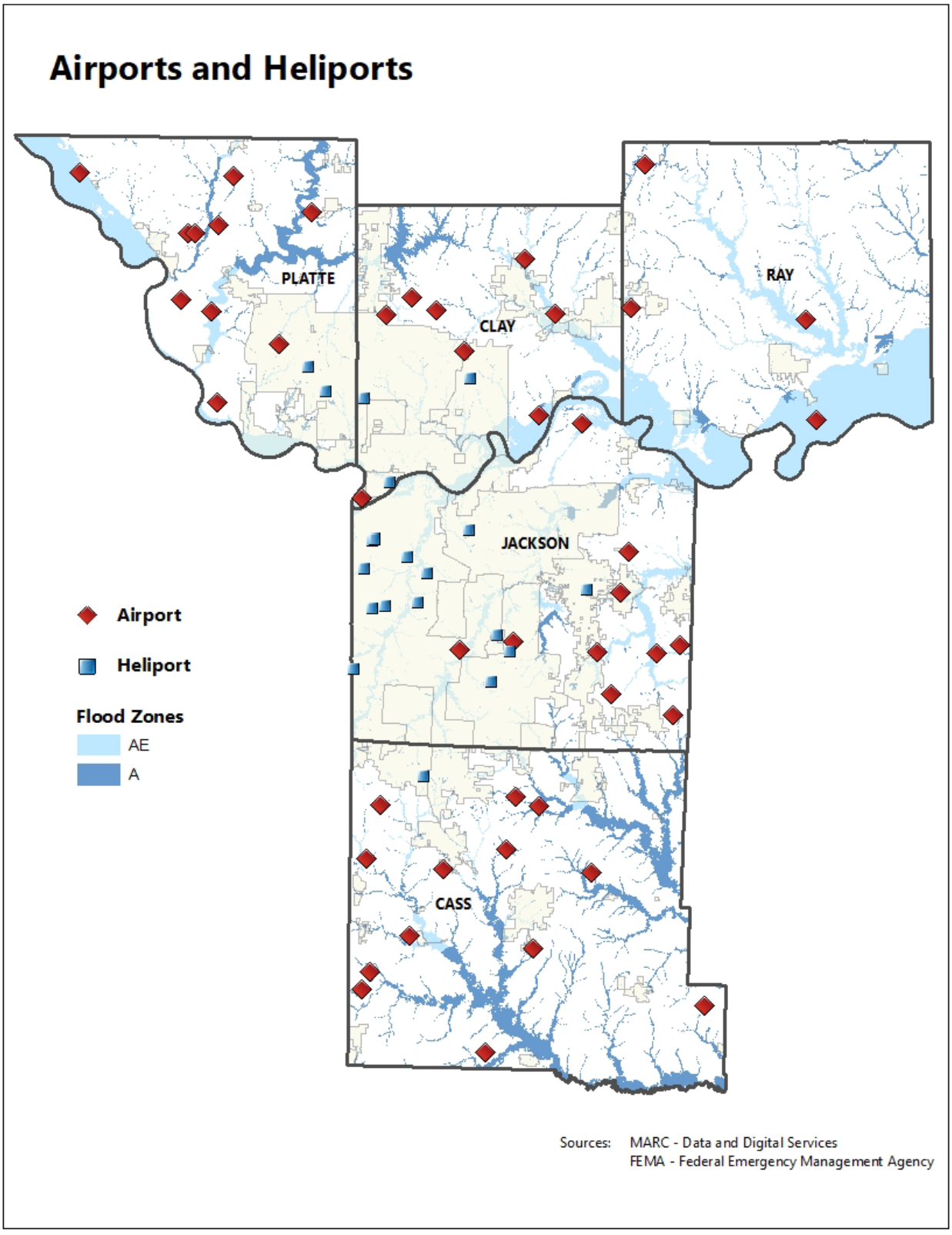


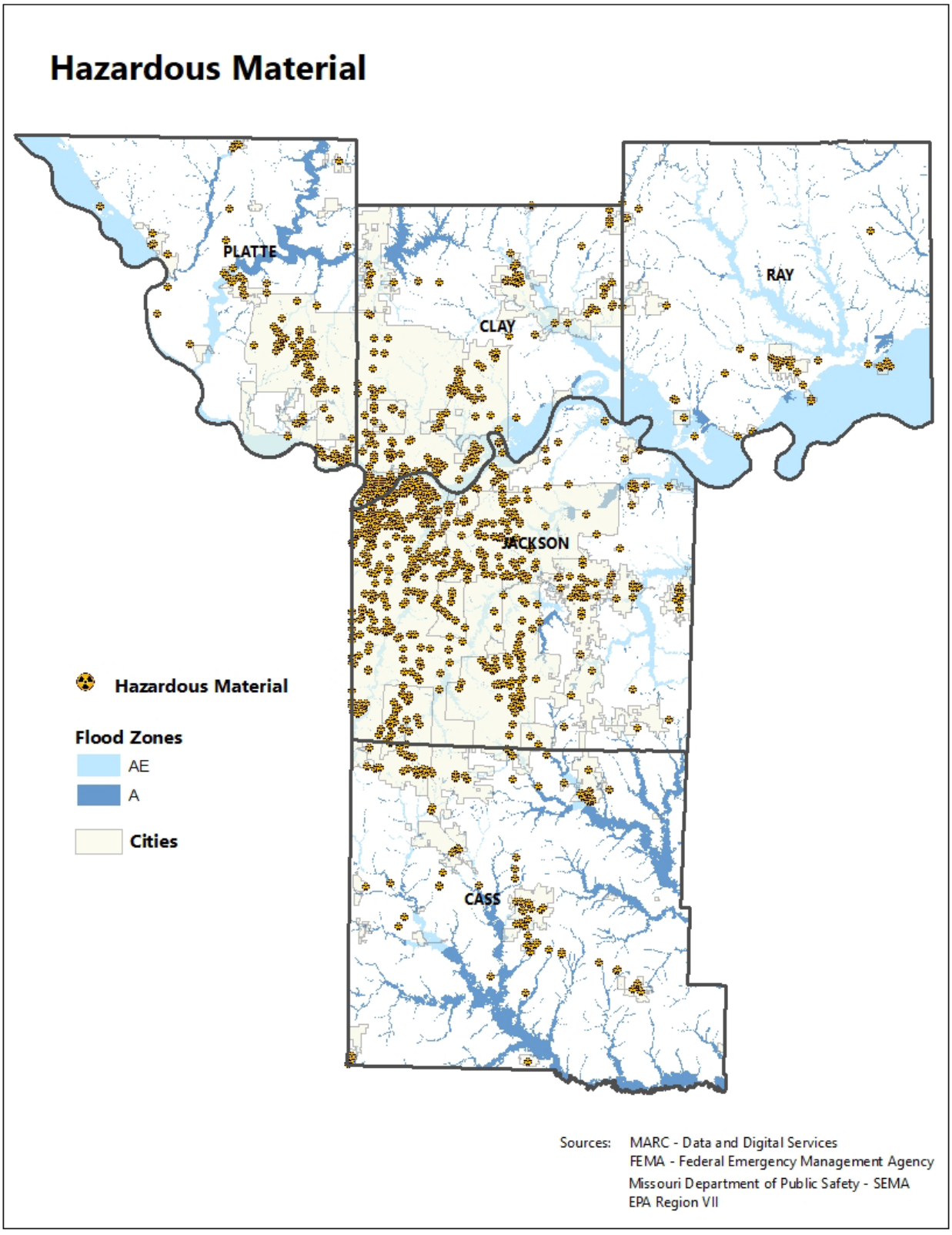

Arena, Stadium, Sports Complex, Historic Site,
Grocery Store, Cooling or Warming Center
PLATTE
CLAY
RAY
JACKSON
CASS
Historic Sites
Cooling Warming Centers
Arena - Stadium - Sports Complex
GroceryStores
Flood Zones
AE
A
Sources: MARC - Data and Digital Services

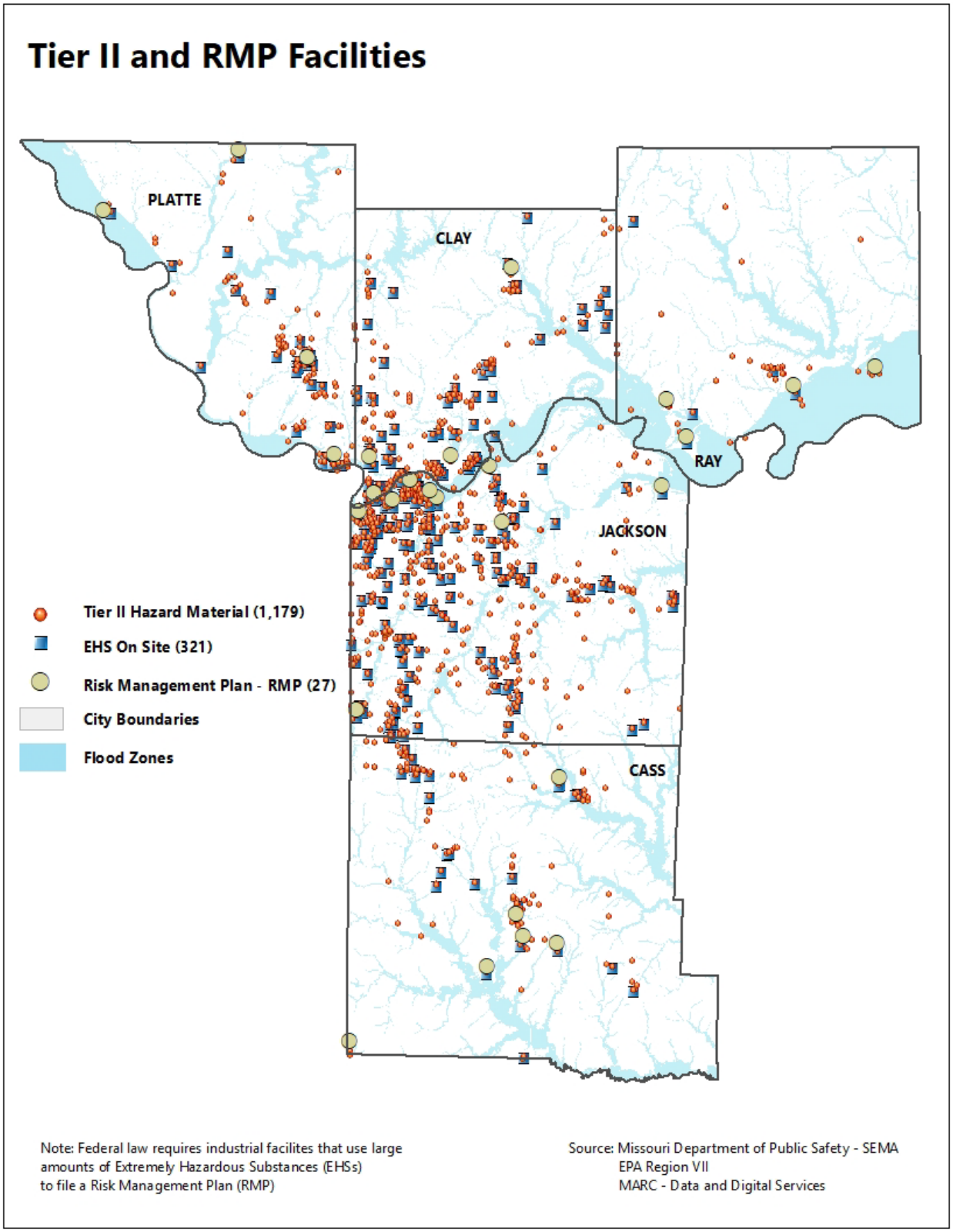

Schools, Colleges, Child Care Centers and Libraries
PLATTE
CLAY
RAY
JACKSON
CASS
Library
Child Care Center
Schools and Colleges
Cities
Flood Zones
Sources: MARC - Data and Digital Services


Assisted Living, Hospitals, Trauma Hospitals
PLATTE
CLAY
RAY
JACKSON
CASS
Hospital
Assisted Living
Trauma Hospital
Flood Zones
AE
A
Sources: MARC - Data and Digital Services


Fire - Police Stations and Emergency Operation Centers
PLATTE
CLAY
RAY
JACKSON
CASS
Public Safety Services
Fire/EMS
Police Stations
EOCs
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Airports and Heliports
PLATTE
CLAY
RAY
JACKSON
CASS
Airport
Heliport
Flood Zones
AE
A
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency


Hazardous Material
PLATTE
CLAY
RAY
JACKSON
CASS
Hazardous Material
Flood Zones
AE
A
Cities
Sources: MARC - Data and Digital Services
FEMA - Federal Emergency Management Agency
Missouri Department of Public Safety - SEMA
EPA Region VII


Tier II and RMP Facilities
PLATTE
CLAY
RAY
JACKSON
CASS
Tier II Hazard Material (1,179)
EHS On Site (321)
Risk Management Plan - RMP (27)
City Boundaries
Flood Zones
Note: Federal law requires industrial facilites that use large amounts of Extremely Hazardous Substances (EHSs) to file a Risk Management Plan (RMP)
Source: Missouri Department of Public Safety - SEMA
EPA Region VII
MARC - Data and Digital Services

4.9.6 Problem Statements

Vulnerability statements, such as those below, can support development of mitigation strategies for flooding:

- Buildings and critical infrastructure (including hazardous materials sites) within each county are vulnerable to flood damage.
- Many homeowners and business owners may not understand changes to the National Flood Insurance Program (NFIP) from the Homeowner Flood Insurance Affordability Act of 2014 and how it impacts them.
- In some cases, flood control actions taken by one jurisdiction or community can negatively impact downstream or neighboring jurisdictions.
- Fewer programs and grants exist to support flood mitigation efforts than in the past.
- Mitigation efforts that could be most effective include flood buyouts, implementation of the Federal Flood Insurance Program and the adoption of stream setback ordinances to keep development further from area streams and floodplains. Other efforts might include partnerships with agencies to provide temporary shelter/housing for those displaced.
- Changing weather patterns can increase the frequency and severity of flash floods and will be exacerbated by city design/development.

4.10 Levee Failures

Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant surfaces are stressed beyond their capabilities to withstand floods, levee failure can result in loss of life and injuries as well as damages to property, the environment, and the economy. Levees are usually engineered to withstand a flood with a computed risk of occurrence. In Missouri, there are an estimated 1,926 miles of levees, many of which were largely constructed to protect agricultural land and are not built to design standards established to protect people and property.[xviii] Their presence can, in some cases, generate a false sense of security. If a larger flood occurs, that structure will likely be compromised. In the event of a levee failure, the water behind it can be released as a flash flood. Failed levees can create floods that are catastrophic to life and property, in part because of the tremendous energy of the released water. **See Figure 4.10.1.**

Source: Jackson County, MO Sheriff's Office[xix]

Figure 4.10.1: Breached Levee in Levasy, Missouri

For the purposes of this plan, the term levee failure will refer to both overtopping and breach of a levee.[xx] Overtopping occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee. A levee breach occurs when part of the levee gives way, creating an opening through which floodwaters may pass. **See Figure 4.10.2 – Figure 4.10.3.**

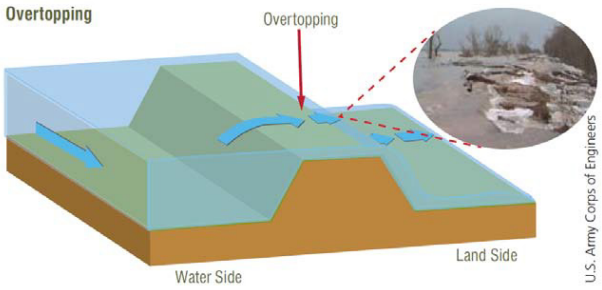


Figure 4.10.2: Overtopping of a Levee

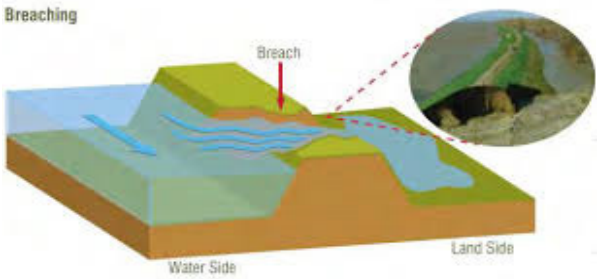


Figure 4.10.3: Breaching of a Levee

Source: Missouri State Hazard Mitigation Plan 2013

Earthen levees can be damaged in several ways. **Figure 4.10.4** presents a few inundation scenarios. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters — and even large objects such as boats or barges — can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. Seismic activity can also cause levees to slide or slump, both of which can lead to failure.

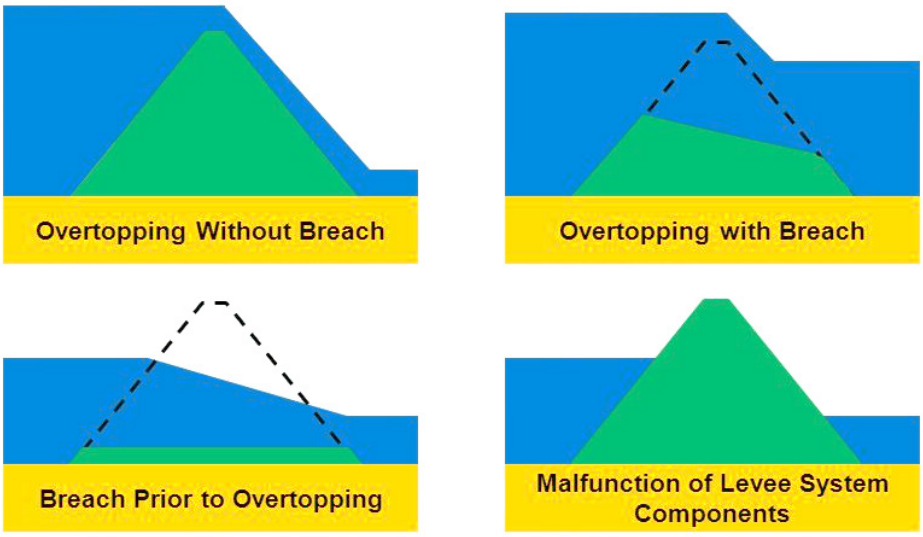


Figure 4.10.4: Inundation Scenarios

Source: Missouri State Hazard Mitigation Plan 2013

Three categories of levees are discussed in the Levee Failure profile:

1. Levees in the USACE Levee Safety Program
2. FEMA Accredited Levees
3. Levees that are both in the USACE Levee Safety Program and Accredited by FEMA

Levees in the USACE Levee Safety Program

The Levee Safety Program (LSP) was created by the USACE in 2006 to assess the integrity and viability of levees and to make sure levee systems that do not present unacceptable risk to the public, property and environment. Under this program, the USACE conducts levee inspections that are used to rate levee systems and determine compliance with operation and maintenance requirements, understand the overall levee condition, and determine eligibility for federal rehabilitation assistance under PL84-99.[xxi]

According to the National Levee Database managed by USACE, there are currently 36 levees in the Kansas City region included in the Levee Safety Program, of which one is rated acceptable, 18 are rated minimally acceptable, and 15 are not reported. Eleven of the 34 levees are federally constructed and turned over to the public sponsor for operations and maintenance. All other levees are locally constructed, operated and maintained.

See **Table 4.10.1** for specific levees in the USACE LSP as of December 31, 2014[xxii]

Table 4.10.1: USACE Levees in Cass, Clay, Jackson, Platte, and Ray Counties

County	NAME	Public Sponsor	Length (Miles)	Leveed Area Acreage	Levee Safety Action Classification	People at Risk	Structures at Risk	Property Value
Clay	Birmingham Unit	Birmingham Drainage District	10.84	4,990	Low	1,113	209	$489M
Clay	North Kansas City Levee Unit	City of Kansas City, Missouri, North Kansas City Levee Unit	8.70	2,909	Moderate	26,703	1,658	$4.4B
Clay, Jackson	Northeast Birmingham Unit	Undefined	0.84	435	Not Screened	0	0	$0
Clay, Ray	Egypt L&D District Tri-County Ray Clay Jack	Egypt Levee & Drainage District, Tri-County of Ray, Clay, Jackson, MO	13.31	4,526	Low	0	0	$0

Jackson	East Bottoms Unit	City of Kansas City, Missouri	9.15	4,335	Moderate	16,539	751	$5.6B
Jackson	FIRE PRAIRIE CREEK - LEVASY	Undefined	2.66	344	Not Screened	4	2	$700K
Jackson	FIRE PRAIRIE CREEK LEVEE 1	City of Levasy	0.61	187	Not Screened	12	4	$1.4M
Jackson	FIRE PRAIRIE CREEK LEVEE 2	City of Levasy	1.73	342	Not Screened	570	228	$88.4M
Jackson	FIRE PRAIRIE CREEK LEVEE 3	City of Levasy	2.71	578	Not Screened	14	8	$2.66M
Jackson	GSA Bannister Complex	Department of Energy	1.66	289	Not Screened	6,573	276	$1.69B
Jackson	Lake City AAP	Lake City AAP	4.26	2,061	Not Screened	188	6	$4.91M
Jackson	LAKE CITY AAP	Lake City AAP	3.74	1,435	Not Screened	0	0	$0
Jackson	Liberty Bend Cutoff Levee Left Bank	Liberty Bend Non-Project , USACE	0.82	802	Not Screened	128	24	$25.4M
Jackson	Liberty Bend Cutoff Levee Right Bank	Liberty Bend Non-Project , Liberty Bend Right Bank Non-Project Segment Upstream, USACE	1.02	635	Not Screened	4	12	$7.88M
Jackson	MRLS 351-R	Atherton Levee District, Atherton-Blue Mills Levee District	16.00	8,154	Low	245	140	$80.4M
Jackson, Wyandotte	CID, Central Industrial District	City of Kansas City, Missouri, Kaw Valley Drainage District	1.84	950	Moderate	7,494	287	$967M

Jackson, Wyandotte	Turkey Creek RB Levee, Tunnel and Walled Channel	United Government of Wyandotte County	0.54	194	Not Screened	1,394	219	$424M
Platte	MRLS 385-L Quindaro Bend	Riverside Quindaro Bend Levee District	4.04	1,446	Low	1,367	42	$310M
Platte	MRLS 385-L Riverside	Riverside Quindaro Bend Levee District	1.22	139	Low	438	54	$90.2M
Platte	MRLS 400-L	Waldron Levee District	7.33	3,821	Low	66	41	$9.28M
Platte	MRLS 400-L Ring Levee	Waldron Levee District	0.14	3	Low	2	2	$105K
Platte	MRLS 408-L	Farley-Beverly Drainage District	12.19	9,827	Low	222	127	$41.6M
Platte	Platte County Drainage Dist 1 sec. 2, Bean Lake	Bean Lake Levee Association, Platte County Drainage District	9.40	6,674	Low	304	425	$45M
Platte	Sugar Creek Levee 1	Undefined	0.78	232	Not Screened	4	2	$830K
Platte, Buchanan	Platte County Drainage District No. 1 Section 1	Platte County Drainage District, Rushville-Sugar Lake	12.18	9,136	Low	304	425	$45M
Ray	HENRIETTA-CROOKED RIVER L&D DIST, SEC 2 B	Undefined	1.21	58	Not Screened	2	2	$760K
Ray	MO VALLEY D&L DIST OF RAY CO. MO, SECTION 1 A	Undefined	1.98	1,273	Not Screened	14	9	$2.55M
Ray	MO VALLEY D&L DIST OF RAY CO. MO, SECTION 1 B	Undefined	1.97	525	Not Screened	210	86	$30.3M

Ray	MO VALLEY D&L DIST OF RAY CO. MO, SECTION 2	Undefined	1.70	576	Not Screened	0	2	$390K
Ray	MO Valley D&L Dist. of Ray Co. MO, Section 2	MO Valley D&L Dist. of Ray Co. MO	1.96	277	Low	0	0	$22.2K
Ray	MO Valley D&L Dist. of Ray Co. MO, Section 3	MO Valley D&L Dist. of Ray Co. MO	2.66	287	Low	0	0	$49.1K
Ray	RAY-LAFAYETTE LEVEE DIST. NO. 2	Undefined	1.69	511	Not Screened	0	0	$0
Ray, Carroll	The Ray-Carroll Levee District of Ray County, Missouri	The Ray-Carroll Levee District of Ray County, Missouri	21.86	13,575	Low	627	372	$77.7M
Ray, Lafayette	MO Valley D&L Dist. of Ray Co. MO, Section 1	MO Valley D&L Dist. of Ray Co. MO	13.65	9,928	Low	78	104	$14.4M
Ray, Lafayette	RAY-LAFAYETTE LEVEE DIST. NO. 1	Undefined	5.25	8,044	Not Screened	32	20	$9.9M
Ray, Lafayette	Ray-Lafayette Levee Dist. No. 1	Henrietta-Crooked Section 1, Ray-Lafayette		29,693	Low	399	239	$48.8M

FEMA Accredited Levees

Many levees shown on the effective Flood Insurance Rate Maps (FIRM) were mapped in the 1970s and 1980s and have never been remapped by FEMA. Prior to 1986, levees were shown on FIRMs as providing protection from base flood when they were designed and constructed in accordance with sound engineering practices. Since 1986, levees have been shown as accredited on FIRMs only when they meet the requirements of 44 CFR 65.10 “Mapping Areas Protected by Levee Systems,” including certification by a registered professional engineer or a federal agency with responsibility for levee design.

Levees that do not meet the requirements of 44 CFR 65.10 cannot be shown as accredited on a FIRM. Furthermore, floodplain areas behind the levee are at risk to base flood inundation and are mapped as high-risk areas subject to FEMA’s minimum floodplain management regulations and mandatory flood insurance purchase requirement.

In 2004, as it initiated work under the Flood Map Modernization Initiative (Map Mod), FEMA determined that analysis of the role of levees in flood risk reduction would be an important part of the mapping efforts. A report issued in 2005 noted that the status of the nation's levees was not well understood and the condition of many levees and floodwalls had not been addressed since their original inclusion in the NFIP. As a result, FEMA established policies to address existing levees.

For the remainder of this discussion, FEMA Accredited Levees will be discussed in two main types: those mapped on Digital Flood Insurance Rate Maps (DFIRM) since the Flood Map Modernization Initiative and those that are mapped prior to the initiative and not mapped on DFIRMs.

FEMA Accredited Levees Mapped on DFIRMS

As DFIRMs are developed, levees fall under one of the three following categories:

Accredited Levee – With the exception of areas of residual flooding (interior drainage), if the date and documentation specified in 44 CFR 65.10 is readily available and provided to FEMA, the area behind the levee will be mapped as moderate-risk areas. There is no mandatory flood insurance purchase requirement in a moderate-risk area, but flood insurance is strongly recommended.

Provisionally Accredited Levee (PAL) – If data and documentation is not readily available, and no known deficiency precludes meeting requirements of 44 CFR 65.10, FEMA can allow the party seeking recognition up to two years to compile and submit full documentation to show compliance with 44 CFR 65.10. During this two-year period of provisional accreditation, the area behind the levee will be mapped as moderate-risk with no mandatory flood insurance purchase requirement.

De-Accredited Levees – If the information established under 44 CFR 65.10 is not readily available and provided to FEMA, and the levee is not eligible for the PAL designation, the levee will be de-accredited by FEMA. If a levee is de-accredited, FEMA will evaluate the level of risk associated with each non-accredited levee through its Levee Analysis Mapping Procedures (LAMP) criteria to consider how to map the floodplain and which areas on the dry side of the levee will be shown as high risk. The mapping will then be updated to reflect this risk.

Table 4.10.2 shows the status of accredited levees within the region. The table distinguishes between USACE program levees and non-USACE program levees.

Table 4.10.2: Levee Accreditation Status in DFRIM Counties in the Kansas City Region				
County	**Primary Community**	**Levee Owner**	**USACE Program Levee**	**Levee Status**
Clay	Kansas City, MO	Birmingham Drainage District	Yes	PAL
Clay	Kansas City, MO; North Kansas City, MO	City of Kansas City, MO	Yes	Accredited
Clay	North Kansas City	North Kansas City Levee District	Yes	PAL
Jackson	Kansas City, MO	City of Kansas City, MO	Yes	PAL
Jackson	Jackson County Unincorporated Areas	Atherton Levee District	Yes	PAL
Jackson	Jackson County Unincorporated Areas	Atherton- Blue Mills Levee District	Yes	PAL
Jackson	Kansas City, MO	GSA	Yes	Accredited
Jackson	Levasy	Northeast Industrial District (East Bottoms)	Yes	Not PAL Eligible
Platte	Platte County Unincorporated Areas	Waldron Levee District	Yes	PAL
Platte	Platte County Unincorporated Areas	Farley-Beverly Levee District	Yes	PAL
Platte	Riverside	Riverside- Quindaro Bend Levee District	Yes	PAL
Platte	Riverside	Riverside- Quindaro Bend Levee District	Yes	PAL
Ray	None Identified			

4.10.1 Historical Occurrences

Data Limitation: The damage years for levees in the five-county area are unknown. The Missouri State Hazard Mitigation Plan provides an example of levee damage history (1942–1993) for southeastern Missouri. A similar history can provide the extent and probability for the Kansas City area. For example, Ray County has received 13 federal disaster declarations for flooding.[xxiii]

The historical narratives below provide an overview of significant floods in recent years relative to levee failure mainly due to spring thaw and storms.

Flood of 1993 Summary

Known as the "Great Flood of 1993," this flood is considered to be among the most expensive ever in the United States, with total damages of over $15 billion and an overall death toll of 50, of which at least 13 took place in Missouri. This flood evolved from a series of heavy rain events along the Missouri and Mississippi Rivers, culminating with a crest of 49.58 feet and a flow of 1.08 million cubic feet per second on August 1 on the Mississippi River at St. Louis. The areas of record flooding extended well upstream on both the Missouri and Mississippi Rivers within Missouri, including western Illinois, western Wisconsin, southern Minnesota, southeastern South Dakota, eastern Nebraska, and much of Kansas, Missouri and Iowa. Months of heavy rainfall followed a winter of near- to above-average snowfall to produce significant spring flooding over much of Missouri. For the first seven months of 1993, United States

Department of Agriculture/Agriculture Stabilization and Conservation Service county offices reported more than 50 inches of rainfall in Osage, Sullivan and Worth Counties — more than twice their normal totals. In June and July, the rainfall intensified as mainly nocturnal thunderstorms affected much of the lower Missouri and middle Mississippi River basins.

Throughout the Midwest, at least 75 towns were completely inundated, an estimated 54,000 people were evacuated, and about 50,000 homes were damaged or destroyed by the flooding. And personal impacts extended well beyond flooded structures. In Iowa, for example, tens of thousands of people were unable to work due to a lack of public water supplies needed for sanitation, firefighting, and routine operation of businesses. Transportation was severely affected throughout Missouri. At one point in July, all road bridges between St. Louis and Burlington, Iowa, were closed due to flooding. On Friday, July 16, only 5 of 28 bridges connecting Missouri with Illinois were open. At one point, all bridges crossing the Missouri River between St. Louis and Kansas City were closed, along with sections of Interstates 29, 35, and 70 across Missouri, all at considerable cost to the trucking industry. Along the Mississippi River, barge traffic was halted for over a month, costing the barge industry between $3–4 million each day. The rail industry suffered losses of over $300 million, with more than $100 million in losses in Missouri alone. Damages to locks and dams and levee systems were staggering. Over a thousand levee systems, including 40 federal levees, were damaged or destroyed.

The agriculture industry also experienced huge losses. More than 600 billion tons of topsoil were removed by the flood and deposited downstream. Over a million acres were flooded, much of it farmland. All of this was a complete loss at harvest time, resulting in a total agricultural loss of $1 billion.

According to SEMA, this flood brought issues related to levees to the forefront.[xxiv] The flood approached or exceeded the 100-year threshold on most major rivers and resulted in overtopping or failure of large numbers of levees, most of them agricultural levees that provided various levels of damage/risk reduction. As a result of this flooding, 840 of Missouri's estimated 1,456 levees were damaged. A number of flood-level records were broken in 1993. In the USACE St. Louis and Kansas City Districts, 867 of 947 federal and non-federal levees failed or were overtopped, greatly contributing to the flooding. (See Table 4.10.3) The Missouri River, normally no more than a half-mile wide, expanded to 5–6 miles wide north of St. Joseph and 8–10 miles wide east of Kansas City.

Table 4.10.3 Number of Failed or Overtopped Federal and Non-Federal Levees – 1993 Flood

USACE District	Federal	Non-Federal
Kansas City	6 of 48	810 of 810

Source: Missouri State Hazard Mitigation Plan

2011 Flooding Summary[xxv]

On July 25, 2011, a major disaster declaration was requested due to flooding during the period of June 1 to August 1, 2011 (See Figure 4.10.5). The governor requested a declaration for individual assistance for 11 counties, public assistance for 22 counties and hazard mitigation for the entire state of Missouri. During the period of July 18–22, 2011, joint federal, state, and local PDAs were conducted in the requested counties and are summarized below.

Figure 4.10.5: Summer Flood Extents (Missouri)[xxvi]

Flooding 2017

Cass, Clay, Jackson, Platte, and Ray counties did not receive federal disaster declaration in 2017. However, a period of flooding occurred during the months of July and August. On the evening of July 26, a line of thunderstorms formed roughly along the Interstate 70 corridor. The storms remained over Kansas City and surrounding areas for several hours, causing some extreme flash flooding. Some of the heaviest rain hit some of the most vulnerable parts of the city, namely Indian Creek near the Kansas and Missouri state line. The Kansas City area received 5 to 7 inches of rain fall over a roughly 3-hour period, causing Indian Creek at State Line Road to rise to 27.96 feet, a new record for that location. The result was businesses in that area becoming inundated with several feet of running water. Numerous car dealerships saw much of their merchandise go underwater at that location. A strip mall consisting of a restaurant among other businesses had water at least 6 feet deep.[xxvii]

From August 21st through the 22nd, multiple rounds of heavy rain fell, with some of the highest totals observed over the southwestern portions of the Kansas City metro area and other locations south of Kansas City. Widespread amounts of 4 to 6 inches were recorded, with isolated reports of 8 to nearly 10 inches. In addition to numerous roads and some schools closed due to widespread flooding, record crests were made on Indian Creek at State Line Road. Several water rescues were made overnight on August 21 2017, due to flooding.[xxviii]

2019 Flooding

On May 21, 2019 FEMA announced that federal disaster assistance has been made available to the state of Missouri to supplement state and local recovery efforts in the areas affected by severe storms, straight-line winds, and flooding on March 11 to April 16, 2019.[xxix] Platte and Ray counties were included in this declaration to receive funding for emergency work and repair or replacement of facilities due to severe storms, straight-line winds, and flooding.[xxx]

Bean Lake is a levee system that runs seven miles in Platte County, Missouri. It was breached on March 20, 2019 as well as during the flood of 1993. It's operated by two agencies, the Platte City Drainage District (Platte County Section 2 segment) and the Bean Lake Levee Association (Bean Lake segment). It was inspected in June 2012. The Corps' 2016 risk assessment said that the "likelihood of a flood

overtopping this levee in the next year has been estimated at 2 percent, (one chance in 50)." Extrapolated out, that equaled a 45 percent "likelihood of water overtopping the levee over the life of a typical 30-year mortgage."[xxxi]

Rushville Sugar Lake is a 10.2-mile levee running across Buchanan and Platte counties in Missouri and operated by the Rushville Sugar Lake Levee District. It was breached around March 22, 2019. It was last inspected in June 2012. The likelihood of a flood overtopping this levee was estimated at 5 percent, or a one-in-20 chance, the assessment said. That equaled a 79 percent "likelihood of water overtopping the levee over the life of a typical 30-year mortgage."[xxxii]

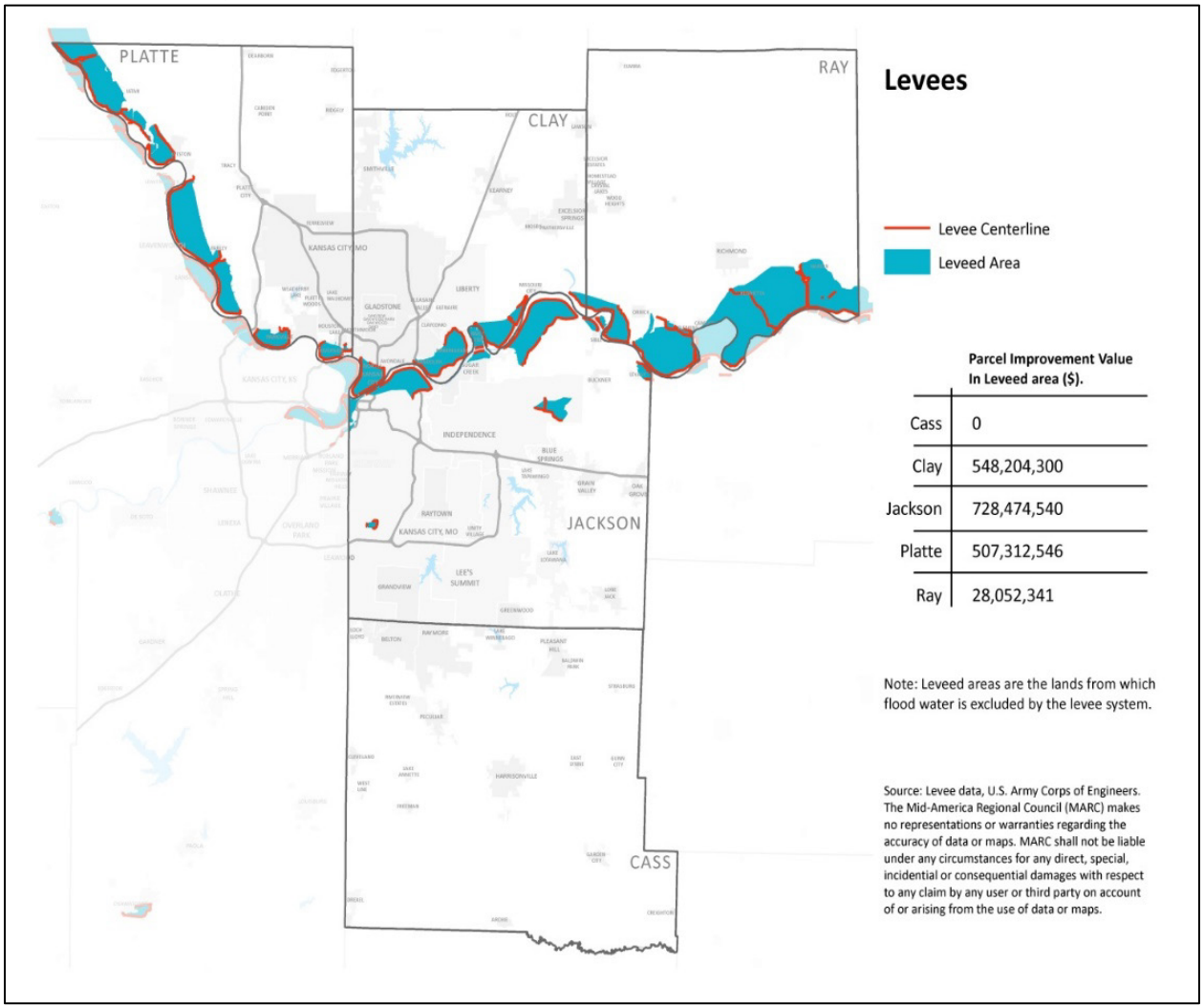
On June 24, 2019 Governor Mike Parson, Lt. Governor Mike Kehoe requested the President Donald Trump issue a major disaster declaration for flood, storm, and tornado damage beginning on April 29th, 2019. This declaration request involved 41 counties, Jackson and Platte among them. The Governor's request stated $25 million in qualifying expenses that had already been identified.[xxxiii] "Governor Parson said joint Preliminary Damage Assessments, conducted by the **State Emergency Management Agency**, **U.S. Small Business Administration**, **Federal Emergency Management Agency**, and local officials, examined 1,650 primary homes, of which 953 had been destroyed or sustained major damage. The assessments also showed that 125 of 251 businesses that were examined had been destroyed or sustained major damage"

4.10.2 Probable Locations

Magnitude 10%-15%

Figure 4.10.6 below is the Location of Levees and Protected Areas within the Kansas City Region. A magnitude rating of 10%-15% was given to all counties except Cass, because only the portions of the county near levee locations will be affected in the event of a levee failure.

Figure 4.10.6 Location of Levees and Protected Areas, Kansas City Region



4.10.3 Impact

"Levees in the state of Missouri that are accredited against the 0.2 percent and 1 percent annual chance of flooding provide protection for close to 2,200 square miles of land. The majority of privately constructed and maintained levees provide protection for an even greater expanse of agricultural land. Should major flood events like the 1993 flood strike, the severity of damage to human lives and properties from all levee failures is expected to be high. While the U.S. Army Corps of Engineers has done major levee reconstruction for levees that are in the PL84-99 program following the 1993 flood, proper inspection, diligent maintenance and timely repair are key to controlling the severity of levee failure damage in the event of another catastrophic flood.

The magnitude of levee failure during a flooding event can be very similar to a dam failure in that the velocity of the water caused by sudden release. A levee breach can result in a flood surge or flood wave that can cause catastrophic damages. If the levee is overtopped due to flood waters more than that of the levee design, impacts are similar to flood impacts."

4.10.4 Probability of Future Occurrence: Low (500-year Event) to High (100-year Event)

Given the numerous levee systems constructed along the main stems and tributaries of the Missouri River, the Kansas City region is highly susceptible to catastrophic levee failure and/or overtopping. Not counting the great flood of 1993, for the 70-year period from 1942 to 2012 for which levee failure statistics are available, over 100 levee failures/over toppings were recorded. In the Flood of 1993 alone, 840 levees — over 55 percent of the levees in the state of Missouri — sustained significant damages. This translates to an overall high probability of 1 percent (100-year event) annual chance flood levee failure in any given year. The probability of a 0.2 percent (500-year event) annual chance flood levee failure has been defined as low for this plan update.[xxxv]

4.10.5 Vulnerability Analysis and Potential Loss Estimates

Flooding is the most common hazard associated with levee failure, breach or overtopping. A levee failure, breach or overtopping can result not only in loss of life, but also considerable loss of capital investment, loss of income and property damage. As discussed in the introduction to this section, extreme flooding conditions have the potential to result in levee failures. Since levee failure is an area-specific hazard, potential loss estimates could be tied directly to the hazard area by jurisdiction. Table 4.10.4 below is the resultant potential loss estimates for jurisdictions within the levee protected areas (*asterisks indicate the community is a current plan participant).

Table 4.10.4 Potential Loss Estimates for County/City Structures and Land Protected by Levees

City	Total Building Value	Total land Value	Total Value	City	Total Building Value	Total land Value	Total Value
Cass County	No risk			**Clay County***	$548,204,300	$281,844,500	$830,048,800
Jackson County*	$728,474,540	$205,133,266	$933,607,806	**Platte County***	$507,312,546	$63,719,224	$571,031,770
Ray County*	$28,052,341	$27,726,259	$55,778,600	**Liberty***	$46,700	$1,771,200	$1,817,900
Birmingham	$26,280,600	$4,640,500	$30,921,100	**Missouri City**	$1,164,500	$463,700	$1,628,200
Camden	$0	$63,680	$63,680	**North Kansas City***	$345,595,200	$207,965,200	$553,560,400

Table 4.10.4 Potential Loss Estimates for County/City Structures and Land Protected by Levees							
City	**Total Building Value**	**Total land Value**	**Total Value**	**City**	**Total Building Value**	**Total land Value**	**Total Value**
Farley*	$1,101,561	$4,403,306	$5,504,867	**Parkville***	$10,967	$1,148,209	$1,159,176
Fleming	$0	$468,040	$468,040	**Randolph**	$2,217,800	$4,104,300	$6,322,100
Harden	$16,600,690	$593,120	$17,193,810	**Riverbend**	$0	$98,900	$98,900
Henrietta	$6,281,660	$437,210	$6,718,870	**Riverside***	$204,336,624	$36,368,504	$240,705,128
Independence*	$25,332,006	$13,217,713	$38,549,719	**Sugar Creek**	$9,742,229	$1,361,080	$11,103,309
Kansas City*	$875,002,623	$248,542,150	$1,123,544,773	**Weston***	$20,855	$136,407	$157,262

Data limitations: Since no good modeling exists to more accurately determine potential loss of the levee systems, the loss estimates below assume a total loss of all buildings within the leveed area. While this may be slightly extreme, it is not unrealistic to assume a total levee failure would cause massive if not catastrophic damage to the protected area.

4.10.6 Problem Statements

Vulnerability statements, such as those below, can support development of mitigation strategies for Levees:

- Several local levees don't have public sponsors identified; upkeep and maintenance for these levees is unclear.
- Unregulated private levees, or those installed without the coordination of a levee district may have negative downstream impacts.
- Property owners may be unaware of public information resources about levee safety.

4.11 Dam Failures

The National Dam Safety Act defines a dam as "an artificial barrier which impounds or diverts water and: (1) is more than 6 feet high and stores 50-acre feet or more [of water] or (2) is 25 feet or higher and stores more than 15 acre-feet [of water]." Dam construction varies widely, ranging from small earthen dams containing farm ponds to large structures of reinforced concrete used for hydroelectric power. Between these two extremes are larger earthen dams reinforced with a core of concrete or asphalt. Most dams in Missouri, including those in the Kansas City metropolitan area, are of earthen construction.[xxxvi]

Dam failures are most likely to happen for the following reasons[xxxvii]:

- **Piping** – Piping is caused when seepage through a dam is not properly filtered and soil particles continue to progress, and form sink holes in the dam. Piping failures are usually caused by embankment leakage, foundation leakage and/or the deterioration of structures on the dam.
- **Structural Failure** – Structural failure of materials used in dam construction may be caused by an earthquake, slope instability or poor construction.
- **Cracking** – Cracking of dams may be caused by movement, such as the natural settling of a dam, or by earthquakes.
- **Overtopping** – Overtopping is water spilling over the top of a dam. This condition can deteriorate dams made of earth, rock or mine tailings.
- **Inadequate maintenance and upkeep** – Inadequate maintenance and upkeep can result in one or more of the aforementioned problems, causing failure of the dam.
- **Erosion** – Erosion of dams is generally caused by inadequate capacity of a spillway, resulting in overtopping of the dam, flow erosion or inadequate slope protection.[xxxviii]

These types of failures may be interrelated. Erosion, for example, may weaken the dam and lead to structural failure. Similarly, structural failure of a dam may shorten the seepage path and lead to a piping failure. Many of the region's dams are old, and with age come a greater likelihood of deterioration and the failure of a dam's structure and systems.[xxxix]

Structural failure is the most common cause of dam failure, and flooding is the most common hazard that interacts with dam failure. According to SEMA, "prolonged rains and flooding can saturate earthen dams . . . producing much the same breaching effect as that which occurs with earthen levees. Flooding can also result in overtopping of dams when the spillway and reservoir storage capacities are exceeded by the excess water. A large slide may develop in either the upstream or downstream slope of the embankment and threaten to release the impounded water." Other natural hazards, such as earthquakes or tremors, can also severely damage dams, including complete structural collapse.[xl]

In the 1970s, three major dam failures occurred within a 15-month period, prompting the development of a national dam safety program. Among the most catastrophic were the failures of the Teton Dam in Idaho in 1976, which killed 14 people and caused more than $1 billion in damage, and the Kelly-Barnes Dam in Georgia in 1977, which left 39 dead and $30 million in property damage. In Missouri, dam failures occurred in Lawrenceton in 1968, Washington County in 1975, Fredricktown in 1977, and on December 14, 2005, with the collapse of the Upper Reservoir of Ameren UE's Taum Sauk hydroelectric complex in Reynolds County. Many of Missouri's smaller dams are becoming a greater hazard as they continue to age and deteriorate. Hundreds of dams are in need of rehabilitation; however, a lack of funding and questions of ownership have made it difficult to implement the necessary maintenance.[xli]

The Missouri Department of Natural Resources (MDNR) Water Resources Center is responsible for ensuring that all new and existing non-agricultural, non-federal dams 35 feet or higher meet the minimum safety standards established by the Dam and Reservoir Safety Law. The MDNR has three classifications for all state-regulated dams:

- ***Class 1*** – The area downstream from the dam that would be affected by inundation contains 10 or more permanent dwellings or any public building. Inspection of these dams must occur every two years.
- ***Class 2 –*** The area downstream from the dam that would be affected by inundation contains one to nine permanent dwellings, or one or more campgrounds with permanent water, sewer and electrical services, or one or more industrial buildings. Inspection of these dams must occur once every three years.
- ***Class 3 –*** 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. Inspection of these dams must occur once every five years.

4.11.1 Historical Occurrences

There are no historical occurrences of dam failures in Cass, Clay, Platte, Jackson or Ray counties.

4.11.2 Probable Locations

Magnitude <10%

The National Inventory of Dams (NID),[xlii] developed and maintained by the U.S. Army Corps of Engineers (USACE), and distributed by the Missouri Office of Dam Safety, includes 269 dams in the Kansas City metropolitan area, with 123 of those classified as *high hazard* and 46 classified as *significant hazard*. One high-hazard dam and three significant-hazard dams were included in the 2017 inventory. Lake Deanna Dam and Grand Oaks Dam are both State-regulated and classified as significant-hazard dams. 36601 Jim Owings is a private dam classified as high-hazard. Lake Lotawana Sediment Pond Dam is a private dam classified as significant-hazard. Table **4.11.1** summarizes the 269 dams in Cass, Clay, Jackson, Platte and Ray counties.

Each county was given the lowest magnitude rating of <10% due to no historical dam failure events.

Table 4.11.2 summarizes the 42 dams in the five-county planning area regulated by the state of Missouri by class and hazard. Table 4.11.3 lists all 42 state-regulated dams with select characteristics. The MDNR inventory of dams contains additional information on area dams that is not included in this table due to space limitations. Information from the MDNR inventory of dams is available from the Missouri Department of Natural Resources, Water Resources Program, P.O. Box 250, Rolla, MO 65401, (573) 368-2175.[xliii] As a mitigation measure, stakeholders are encouraged to review the MDNR information on local dams to develop and implement mitigation measures.

Table 4.11.1: Dams by Hazard Level, Owner Type and Height by County						
Owner Type	**High Hazard**	**>35'**	**Significant**	**> 35'**	**Low Hazard**	**>35'**
Cass County						
Local Government	5	1	0	0	3	0

Private	23	4	3	2	36	0
Clay County						
Federal	1	1	0	0	0	0
State	1	1	0	0	1	1
Local Government	0	0	0	0	3	1
Private	13	2	0	0	19	0
Jackson County						
Federal	3	2	0	0	4	0
State	3	1	0	0	8	0
Local Government	5	3	0	0	1	0
Private	40	14	1	0	18	2
Platte County						
Local Government	1	1	0	0	0	0
Private	16	4	0	0	13	0
Ray County						
Local Government	4	2	1	0	10	0
Private	8	3	5	0	20	1
Total						
Federal	4	3	0	0	4	0
State	4	2	0	0	9	1
Local Government	15	7	1	0	17	1
Private	100	27	9	2	106	3
Total	**123**	**39**	**10**	**2**	**136**	**5**

Table 4.11.2: MDNR Regulated Dams by County (Class and Hazard Level)						
County	Regulated Class			Hazard Level		
	Class 1	Class 2	Class 3	High	Significant	Low
Cass	5	2	0	5	2	0
Clay	2	1	2	3	0	2
Jackson	15	3	2	18	0	2
Platte	5	0	0	5	0	0
Ray	1	4	0	5	0	0
Total	**28**	**10**	**4**	**36**	**2**	**4**

Data limitation: The Emergency Action Plans (EAP) for High-Hazard Potential (HHP) dams have been completed and approved for each of the five counties as of the last 2015 Plan update.[xliv] An EAP is a plan of action to reduce potential property damage and loss of lives in an area affected by a dam failure and should include a map of the potential inundation area along with procedures and information for warning downstream emergency management authorities. The process for rolling out EAPs to county officials has been staggered. As of this Plan update, only Jackson County inundation pathways were available for inclusion into this risk assessment.

Table 4.11.3: Missouri State- Regulated Dams in the Five County Planning Area											
County	Name	Class	Hazard	Owner Type	Height (Feet)	Storage (Acre-Ft.)	Primary Purpose	Dam Type	River	Nearest City	Distance (Miles)
CASS	GRAND OAKS FARMS LAKE DAM	2	NUID	Private	35.4	91	-	-	TRIB EAST CREEK	BELTON	3
CASS	HARRISONVILLE CITY LAKE DAM	1	High	Local Govt.	55	13520	Recreation and Water Supply	Earth	TR MIDDLE BIG CREEK	PLEASANT HILL	4
CASS	LAKE DEANNA DAM	2	Signficant	Private	67	1876			HARDING CREEK	NA	0
CASS	LAKE WINNEBAGO DAM	1	High	Private	64	7150	Recreation	Earth	MIDDLE BIG CREEK	LATOUR	21
CASS	LAKE WINNEBAGO DAM EXPANSION, NOT BLT	1	High	Private	63	13700	-	Earth		CITY OF LAKE WINNEBAGO	0
CASS	MILL CREEK DAM	1	High	Private	62	3850	Recreation	Earth	MILL CREEK	BELTON	0
CASS	RAINTREE LAKE DAM	1	High	Private	55	7220	Recreation	Earth	MIDDLE BIG CREEK	PLEASANT HILL	8
CLAY	HELVEY PARK DAM	3	Low	Local Govt.	36	203	Recreation and Water Supply	Earth	TR WILKERSON CREEK	SMITHVILLE	1
CLAY	HOLLY LAKE DAM	1	High	Private	40	140	Recreation	Earth	TR-LITTLE SHOAL CREEK	LIBERTY	0
CLAY	MEADOW LAKE ESTATES DAM	2	High	Private	47	400	-	-	-	-	0
CLAY	WATKINS MILL STATE PARK DAM	1	High	State	55	2600	Flood Control, Storm Water Management, and Recreation	Earth	TR-WILLIAMS CREEK	PRATHERSVILLE	-
CLAY	WILLIAMS CREEK #4 DAM	3	Low	State	46	598	Flood Control, Storm Water Management, and Recreation	Earth	TR TO WILLIAMS CREEK	MOSBY	-
JACKSON	ADAMS DAIRY PARKWAY DAM	2	High	Local Govt.	48	876	Flood Control and Storm Water Management	Earth	TRIB BLUE BRANCH	GRAIN VALLEY	3
JACKSON	BARBER LAKE DAM	1	High	Private	57	2186	Irrigation and Recreation	Earth	TR TO WEST FORK SNI-A-BAR CRK	LAKE LOTAWANA	
JACKSON	CARP LAKE DAM	3	Low	Private	45	83	Recreation	Earth	TR-LITTLE BLUE RIVER	LEES SUMMIT	1
JACKSON	COMMANDEER LAKE DAM	3	Low	Private	42	56	Recreation	Earth	TR-E FK LITTLE BLUE RIVER	INDEPENDENCE	1
JACKSON	DOUTT LAKE DAM	1	High	Private	38	86	Water Supply and Other	Rockfill and Earth	TRIB TO ROCK CREEK	INDEPENDENCE	0
JACKSON	LAKE JACOMO DAM	1	High	Local Govt.	74	38620	Recreation	Earth	EAST FORK LITTLE BLUE RIVER.	LEES SUMMIT	0
JACKSON	LAKE LOTAWANA DAM	2	High	Private	58	11568	Recreation	Earth	WEST FORK SNI-A-BAR CREEK	TARSNEY LAKES	3
JACKSON	LAKE TAPAWINGO DAM	1	High	Private	55	2000	Recreation	Earth	TR EAST FORK OF LITTLE BLUE R	INDEPENDENCE	0
JACKSON	LAKEWOOD-EAST DAM	1	High	Private	75	4810	Recreation	Earth	WEST FORK OF MAY BROOK	LEES SUMMIT	1
JACKSON	LAKEWOOD-WEST DAM	1	High	Private	84	6000	Recreation	Earth	WEST FORM OF MAY BROOK	LEES SUMMIT	1
JACKSON	LONE JACK LAKE DAM	2	High	State	47	660	Flood Control and Storm Water Management	Earth	TRIB TO THE SNI-A-BAR	LONEJACK	25
JACKSON	PRAIRIE LEE LAKE DAM	1	High	Local Govt.	69	6000	Recreation	Earth	EAST FORK LITTLE BLUE RIVER	BLUE SPRINGS	0
JACKSON	ROSENFELT DAM	1	High	Private	57	400	Recreation	Earth	UNNAMED TRIB TO BLUE RIVER	GRANDVIEW	1
JACKSON	TOM SMITH LAKE -EAST DAM	1	High	Private	55	127	Recreation	Earth	TR-BLUE RIVER	KANSAS CITY	3
JACKSON	TOM SMITH LAKE WEST	1	High	Private	50	302	-	Earth	TRIB. BLUE RIVER	STANLEY, KS	5
JACKSON	TOM SMITH SOUTH LAKE DAM	1	High	Private	57	650.8	-	Earth	TRIB. BLUE RIVER	STANLY, KS	5
JACKSON	UNITY #1 DAM	1	High	Private	48	285	Recreation and Water Supply	Buttress	TR-LITTLE CEDAR CREEK	UNITY VILLAGE	0
JACKSON	UNITY #2 DAM	1	High	Private	52	618	Recreation and Water Supply	Earth	TR-LITTLE CEDAR CREEK	KANSAS CITY	2
JACKSON	VIEW HIGH LAKE DAM	1	High	Private	37	148	Recreation	Earth	TR-LITTLE BLUE RIVER	KANSAS CITY	1
JACKSON	WHISPERING HILLS LAKE DAM	1	High	Private	40	190	Recreation	Earth	TR ROUND GROVE CREEK	KANSAS CITY	0
PLATTE	INTERNATIONAL AIRPORT DAM	1	High	Local Govt.	45	1670	Flood Control and Storm Water Management	Earth	TR TODD CREEK	PLATTE CITY	16
PLATTE	LAKE WAUKOMIS DAM	1	High	Private	68	2292	Recreation	Earth	TR LINE CREEK	LAKE WAUKOMIS	0
PLATTE	RISS LAKE DAM	1	High	Private	93	7720	Recreation	Earth	WHITE ALOE BRANCH	PARKVILLE	1
PLATTE	THOUSAND OAKS DAM	1	High	Private	70	190	-	Earth			0
PLATTE	WEATHERBY LAKE DAM	1	High	Private	84	5750	Recreation	Earth	RUSH CREEK	PARKVILLE	3
RAY	CRYSTAL LAKE DAM	1	High	Private	54	2846	Recreation	Earth	FISHING RIVER	EXCELSOR SPRINGS	1
RAY	HEDGES LAKE DAM	2	High	Private	43	115	Irrigation, Fire Protection, Stock, or Small Farm Pond, and Recreation	Earth	TR-SHACKELFORD BRANCH	ORRICK	0
RAY	HIDDEN VALLEY LAKE DAM	2	High	Private	52	454	Recreation	Earth	TR TO ROCKY FORK	HARDIN	0
RAY	LAWSON CITY LAKE DAM	2	High	Local Govt.	45	380	Recreation and Water Supply	Earth	BRUSHY CREEK	ELMIRA	11
RAY	WILLOW CREEK WTRSHD SITE A-1	2	High	Local Govt.	42	2000	Flood Control and Storm Water Management	Earth	WILLOW CREEK	HENRIETTA	-

4.11.3 Impact

There are 123 *high-hazard* dams plus ten *significant-hazard* dams located in the five-county area. The majority of these are privately owned and, if they were to fail, would not cause widespread damage. Dam owners are required to notify MDNR of any problem for *inspection*. Problems deemed a serious nature require the *notification* of emergency personnel. Problems deemed immediate require *evacuation*. The transition between those of a serious nature to immediate can either be a slow or rapid transition. At all three reporting levels, efforts are made to save and repair the dam.

Although unlikely, the failure of one of the USACE's six main stem dams on the Upper Missouri River Basin may also impact the Kansas City metropolitan area. These dams with their respective reservoirs and storage capacity include[xlv]:

- Fort Peck Dam and Lake (18.7 million acre-feet of water) near Glasgow, Montana
- Garrison Dam and Lake Sakakawea (23 million acre-feet of water) near Bismarck, North Dakota
- Oahe Dam and Lake (23.5 million acre-feet of water) near Pierre, South Dakota
- Big Bend Dam and Sharpe Lake (1.9 million acre-feet of water) near Fort Thompson, South Dakota
- Fort Randall Dam and Lake Francis Case (nearly 5.5 million acre-feet of water) near Wagner, South Dakota
- Gavins Point Dam and Lewis and Clark Lake (492,000 acre-feet of water) near Yankton, South Dakota

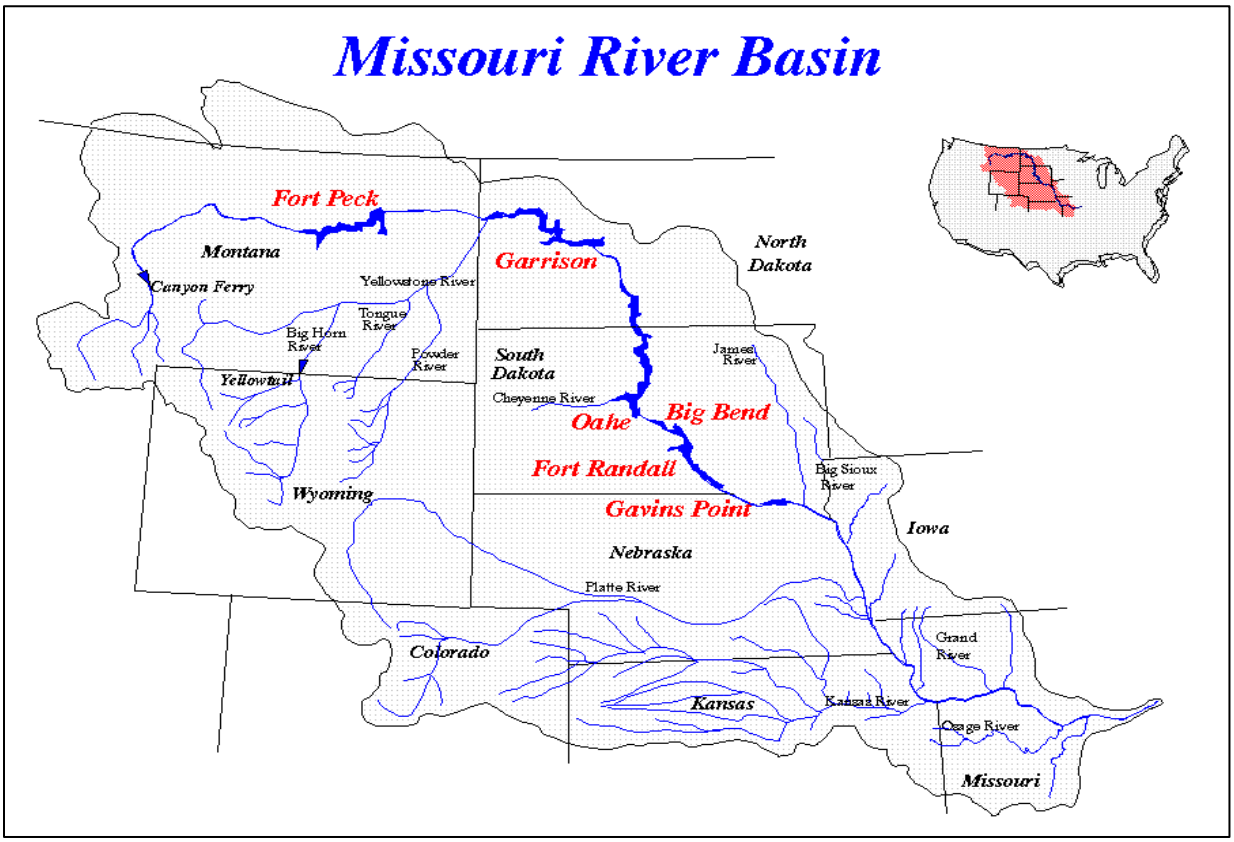
Map 4.11.1 depicts the locations of the six main stem dams on the Upper Missouri River Basin. Each of these dams holds back large bodies of water — Lake Sakakawea and Oahe Lake are two of the largest reservoirs in the nation — and a sudden release of water from one of these reservoirs due to dam failure could have a cascading effect. Water might have to be released from downstream reservoirs to accommodate the additional water received from an upstream dam failure, increasing the flow and level of water in the Missouri River and contributing to the potential for flooding at downstream locations, such as the Kansas City metropolitan area.

Probable Duration
Potential speed of onset (probable amount of warning time):

☐ Minimal (or no) warning
☐ 6 to 12 hours warning
☐ 12 to 24 hours warning
■ More than 24 hours warning

Community Assets
The rise and fall of rushing water can have disastrous impacts on life, property, the economy and the environment. Steps to prevent the loss of life and injuries in the event of a dam failure are similar to those for a tornado. However, instead of seeking shelter underground, evacuation for a dam failure requires people to seek high ground. Persons with disabilities, the elderly, and low-income individuals with limited means would be at a greater disadvantage.

A dam failure would result in damage to residential and commercial structures; critical infrastructure, including transportation and utility service interruptions; and economic losses to agricultural land and businesses. The natural environment could also be impacted by the force of the water damaging or destroying trees and vegetation.



Source: US Army Corps of Engineers, Missouri River Basin Water Management Division

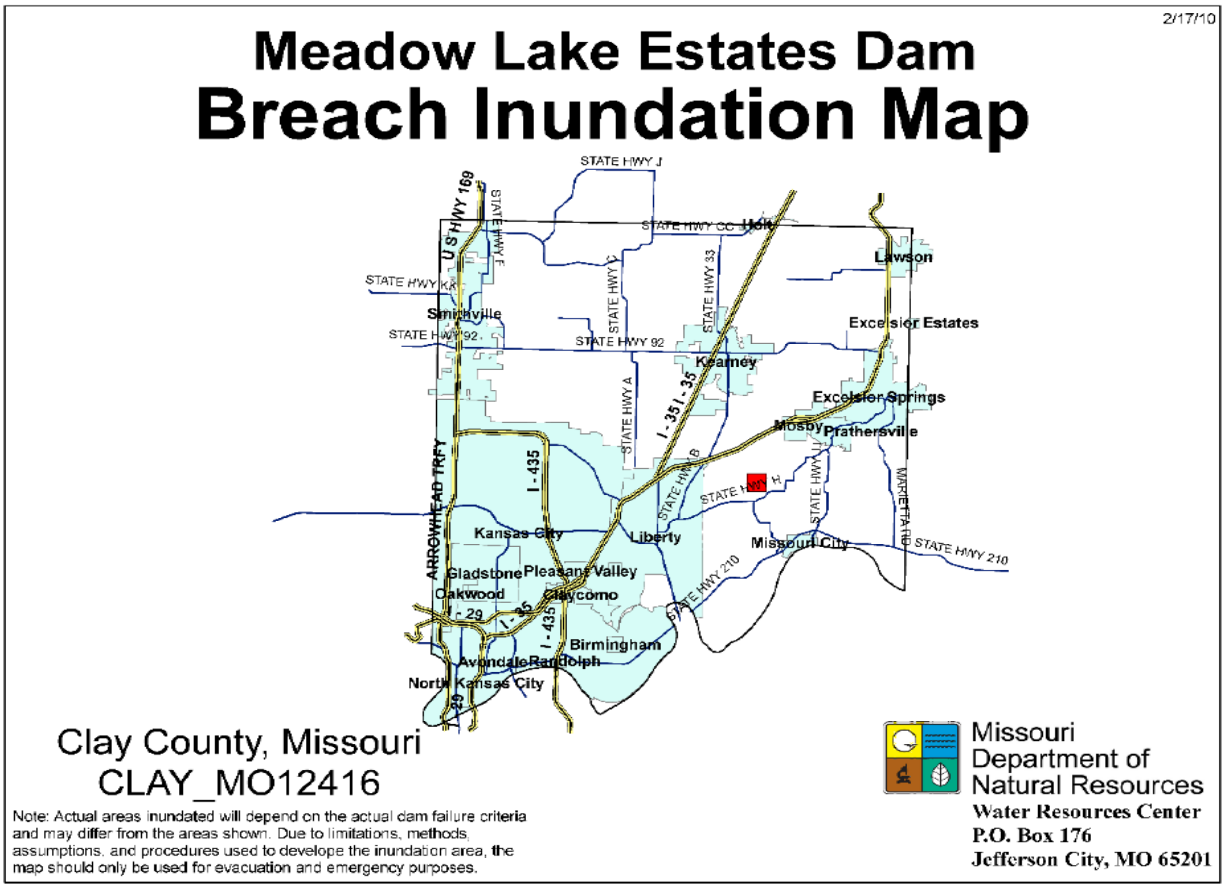
Map 4.11.1: USACE Main Stem Dams in the Upper Missouri River Basin

4.11.4 Probability of Future Occurrence

A probability percentage is unavailable because there no recorded events of dam failure in the five county area. However, the most likely cause of dam failure is heavy rainfall. In the Kansas City metropolitan area, May, June, July and September receive the highest average monthly rainfall amounts. Consequently, the risk of dam failure may be greatest in these months. Although less likely, dam failure may also be caused by a strong earthquake. Earthquakes, however, are not affected by climatic conditions and may occur at any time of the year. The Kansas City metro area is not at high risk for earthquakes (Missouri SEMA New Madrid zone outside KC metro area). Older dams, particularly those holding back large amounts of water, may pose significant risk to downstream populations and structures.

4.11.5 Vulnerability Analysis and Potential Loss Estimates

The Missouri Dam Safety Program reports that all high-hazard dams in the five-county area have approved Emergency Action Plans with inundation maps. As a part of the EAP, dam owners are required to have an evacuation plan and make inundation maps available to the local jurisdiction. See **Map 4.11.2** for a sample map. The state has completed inundation maps for 76 percent of these dams. Once the project is complete, inundation maps will be provided to each respective county in the state for planning and training purposes.[xlvi] Inundation maps are currently available for Jackson County.



Map 4.11.2: Sample Inundation Map (Meadow Lake Estates Dam)

Because inundation pathways are not largely available, the statistical risk assessment methodology was used to estimate loss for dam failures. Table 4.11.4 provides the results of the inundation area analysis with the numbers and values of various types of structures, and populations within the mapped areas for state-regulated dams. The table that follows (Table 4.11.5) provides the same analysis of the inundation area analysis of available USACE dams.

Table 4.11.4. Estimated Numbers and Values of Structures and Population Vulnerable to Failure of State-Regulated Dams with Available Inundation Areas				
County	Category	Number of Structures	Value of Structures	Population
Cass	Agriculture	59	$19,408,826	0
	Commercial	33	$21,877,498	0
	Residential	58	$18,158,559	150
Clay	Agriculture	7	$2,001,237	0
	Commercial	50	$64,219,612	0
	Government	1	$1,363,241	0
	Residential	75	$24,996,090	197
Jackson	Agriculture	33	$11,653,441	0
	Commercial	862	$1,164,527,949	0
	Education	4	$10,806,427	0
	Residential	914	$294,142,638	2,184
Platte	Agriculture	8	$2,425,473	0
	Commercial	56	$59,248,958	0
	Education	1	$2,061,764	0
	Government	2	$2,885,677	0
	Industrial	2	$2,192,478	0
	Residential	106	$39,664,446	269
Ray	Agriculture	3	$1,328,579	0
	Commercial	7	$4,730,945	0
	Residential	2	$551,568	5

Source: Missouri State Hazard Mitigation Plan, 2023

Table 4.11.5. Estimated Numbers and Values of Structures and Population Vulnerable to Failure of USACE Dams with Available Inundation Areas				
County	Category	Number of Structures	Value of Structures	Population
Cass	N/A	N/A	N/A	N/A
Clay	Agriculture	335	$95,773,470	0
	Commercial	666	$855,405,224	0
	Education	9	$21,108,963	0
	Government	38	$51,803,156	0
	Industrial	451	$611,170,441	0
	Residential	2298	$765,880,223	5,975
Jackson	Agriculture	510	$180,098,625	0
	Commercial	807	$1,090,225,121	0
	Education	11	$29,717,673	0
	Government	24	$41,722,484	0
	Industrial	1,875	$2,712,261,594	0
	Residential	4,085	$1,314,630,934	9,967
Platte	Agriculture	600	$181,910,427	0
	Commercial	434	$459,179,431	0
	Education	14	$28,864,695	0

	Government	40	$57,713,527	0
	Industrial	311	$340,930,409	0
	Residential	1,886	$705,727,785	4,640
Ray	Agriculture	899	$398,130,741	0
	Commercial	92	$62,178,136	0
	Education	20	$70,482,819	0
	Government	7	$5,912,062	0
	Industrial	46	$37,760,036	0
	Residential	989	$272,750,163	2,601

Source: Missouri State Hazard Mitigation Plan, 2023

4.11.6 Problem Statements

Vulnerability statements, such as those below, can support development of mitigation strategies for dam failures:

- 134 high-hazard dams (more than 35 feet) that could cause significant damage in inundation pathways exist throughout the planning area. Many of these are unregulated.
- While government and private owners of high-hazard dams have inundation pathways and completed Emergency Action Plans (EAP), these may not have been shared with local officials and potential affected parties.
- Local jurisdictions have little ability to require privately-owned dam owners to adequately maintain dams.
- There may be a need for regular training and exercising of evacuation plans in the vicinity of high-hazard dams.

[i] FEMA Website, Floods and Flash Floods Fact Sheet
[ii] SEMA State Hazard Analysis, Annex B
[iii] USA Today, online data
[iv] SEMA State Hazard Analysis, Annex B
[v] FEMA Web site, Floods and Flash Floods Fact Sheet, online document
[vi] USACE Walla Walla District, online data
[vii] SEMA State Hazard Analysis, Annex B
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[ix] PBS, online data
[x] FEMA Web site, Floods and Flash Floods Fact Sheet, online document
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[xii] Pima County Flood Control District Web site, online data
[xiii] SEMA State Hazard Analysis, Annex B
[xiv] Linda Lam, "A Concerning Trend: Flooding Deaths Have Increased in the U.S. the Last Few Years," *The Weather Channel*, November 8, 2018, https://weather.com/safety/floods/news/2018-11-08-flood-related-deaths-increasing-in-united-states
[xv] Linda Lam, "A Concerning Trend: Flooding Deaths Have Increased in the U.S. the Last Few Years," *The Weather Channel*, November 8, 2018, https://weather.com/safety/floods/news/2018-11-08-flood-related-deaths-increasing-in-united-states
[xvi] NWS Missoula Web site, online data
[xvii] Missouri State Hazard Mitigation Plan, State Estimates of Potential Loss, pg. 3.108-3.109
[xviii] Missouri State Hazard Mitigation Plan, http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

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[xxii] Missouri State Hazard Mitigation Plan
[xxiii] Missouri State Hazard Mitigat6ion Plan
[xxiv] Missouri Stat Hazard Mitigation Plan
[xxv] FEMA Local Planning Guide
[xxvi] Narratives from NOAA Storm Events Database
[xxvi] Narratives from NOAA Storm Events Database
[xxvi] FEMA, https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri
[xxvi] FEMA, https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri
[xxvi] Peggy Lowe, "10 Failed Levees In Midwest Flood Zone Were Not Inspected By Federal Government," KCUR, https://www.kcur.org/post/10-failed-levees-midwest-flood-zone-were-not-inspected-federal-government#stream/0
[xxvi] Peggy Lowe, "10 Failed Levees In Midwest Flood Zone Were Not Inspected By Federal Government," KCUR, https://www.kcur.org/post/10-failed-levees-midwest-flood-zone-were-not-inspected-federal-government#stream/0
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[xxvi] Missouri Governor Michael L. Parson, https://governor.mo.gov/press-releases/archive/missouri-requests-second-federal-disaster-declaration-year-response-flooding
[xxvi] USGS, Geological Survey Professional Paper 1183, Online, http://pubs.usgs.gov/pp/p1183/pp1183.html
[xxvi] SEMA State Hazard Analysis, Annex G, http://sema.dps.mo.gov/newspubs/publications/hazard_analysis.php
[xxvi] American Association of Dam Safety Officials; http://www.damsafty.org/news/?p=c0fdade4-ab98-4679-be22-e3d7f14e124f
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[xxvi] SEMA State Hazard Analysis, Annex G
[xxvi] SEMA State Hazard Analysis, Annex G
[xxvi] Missouri Office of Dam Safety/USACE National Inventory of Dams Webb site, http://nid.usace.army.mil
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[xxvi] Glenn Lloyd, Missouri Dam Safety Program, Phone Interview, May 21, 2015
[xxvi] USACE Omaha District Web site, http://www.nwo.usace.army.mil/Missions/DamandLakeProjects/MissouriRiverDams.aspx
[xxvi] Glenn Lloyd, Phone Interview, 2015
[xxvi] Narratives from NOAA Storm Events Database
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[xxvi] FEMA, https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri
[xxvi] FEMA, https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri
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[xxvi] SEMA State Hazard Analysis, Annex G
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[xxvi] Missouri Office of Dam Safety/USACE National Inventory of Dams Webb site, http://nid.usace.army.mil
[xxvi] http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm
[xxvi] Glenn Lloyd, Missouri Dam Safety Program, Phone Interview, May 21, 2015
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[xxxiv] American Association of Dam Safety Officials; http://www.damsafty.org/news/?p=c0fdade4-ab98-4679-be22-e3d7f14e124f
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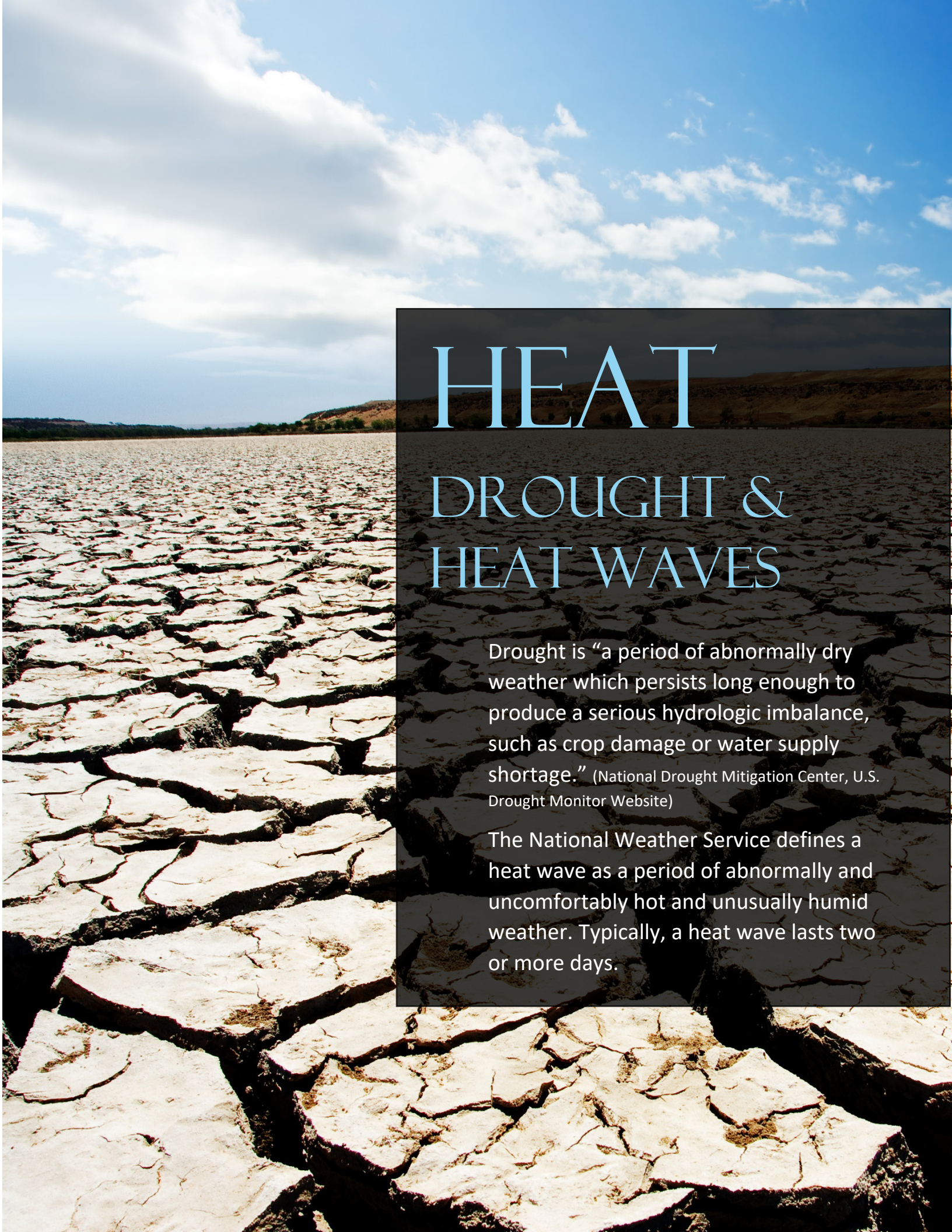
[xlv] USACE Omaha District Web site, http://www.nwo.usace.army.mil/Missions/DamandLakeProjects/MissouriRiverDams.aspx
[xlvi] Glenn Lloyd, Phone Interview, 2015



HEAT

DROUGHT & HEAT WAVES

Drought is “a period of abnormally dry weather which persists long enough to produce a serious hydrologic imbalance, such as crop damage or water supply shortage.” (National Drought Mitigation Center, U.S. Drought Monitor Website)

The National Weather Service defines a heat wave as a period of abnormally and uncomfortably hot and unusually humid weather. Typically, a heat wave lasts two or more days.

4.12 Drought

A drought's severity is dependent on a variety of factors, including its duration, the degree of moisture deficiency and the size of the affected area. Drought can be exacerbated by other climatic conditions, including high temperatures, high winds and low humidity.

There are five categories of drought, each one relating the occurrence of drought to water shortfall in some component of the hydrological cycle. These categories are operational definitions and help to describe the onset, severity and end of droughts. Each category affects patterns of water and land use and refers to a repetitive climatic condition. The categories include:

Meteorological Drought – is a measure of precipitation's departure from normal over a period of time. This definition of drought is region-specific, i.e., a drought in one area may not be considered a drought in another area. According to the National Drought Mitigation Center (NDMC), meteorological measurements usually provide the first indication of drought.[i]

Agricultural Drought – occurs when there is not enough moisture in the soil to meet the needs of a crop at a particular time. According to the NDMC, agriculture is usually the first economic area to be affected by drought.

Hydrological Drought – occurs when surface and subsurface water supplies are below normal. Hydrological drought is determined by streamflow and by lake, reservoir and groundwater levels. Hydrological indicators do not provide early indications of drought, since there is a delay between periods with little or no precipitation and low levels of surface and groundwater.

***Hydrological Drought and Land* Use –** refers to a meteorological drought in one area that has hydrological impact in another area. For example, a drought in the Rocky Mountains may have a significant impact in Missouri, since the Missouri River and its tributaries are partly dependent upon precipitation upstream and snowmelt.[ii]

Socioeconomic Drought – occurs when a physical water shortage begins to affect people.

4.12.1 Historical Occurrences

Drought has been a recurrent climatic feature of the Kansas City metropolitan area for many years. Residents of the Kansas City area have experienced some of the nation's worst periods of drought, including the 1930s Dust Bowl drought, the drought of 1954–1956, the Great Drought 1988–1989, the drought of 1999–2000, and the drought of 2012, which was one of the worst droughts to impact Missouri in over 30 years.

Historical occurrences occurring between May 2019 and November 2024 are depicted in **Table 4.12.1**. The planning area did not have any occurrences of excessive heat between May 2019 and November 2024.

Table 4.12.1 Historical Occurrences, Drought (5/19 to 11/24)						
Location	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
CASS (ZONE)	09/27/2022	Drought	0	0	$0	$0
CASS (ZONE)	10/01/2022	Drought	0	0	$0	$0
CASS (ZONE)	11/01/2022	Drought	0	0	$0	$0
CASS (ZONE)	05/09/2023	Drought	0	0	$0	$0
CASS (ZONE)	06/01/2023	Drought	0	0	$0	$0
CASS (ZONE)	07/01/2023	Drought	0	0	$0	$0
CASS (ZONE)	08/01/2023	Drought	0	0	$0	$0
CASS (ZONE)	10/01/2023	Drought	0	0	$0	$0
Location	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
CLAY (ZONE)	09/27/2022	Drought	0	0	$0	$0
CLAY (ZONE)	10/01/2022	Drought	0	0	$0	$0
CLAY (ZONE)	11/01/2022	Drought	0	0	$0	$0
CLAY (ZONE)	12/01/2022	Drought	0	0	$0	$0
Location	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
JACKSON (ZONE)	07/19/22	Drought	0	0	$0	$0
JACKSON (ZONE)	08/1/22	Drought	0	0	$0	$0
JACKSON (ZONE)	09/1/22	Drought	0	0	$0	$0
JACKSON (ZONE)	10/1/22	Drought	0	0	$0	$0
JACKSON (ZONE)	11/1/22	Drought	0	0	$0	$0
JACKSON (ZONE)	12/1/22	Drought	0	0	$0	$0
JACKSON (ZONE)	05/9/23	Drought	0	0	$0	$0
JACKSON (ZONE)	06/1/23	Drought	0	0	$0	$0
JACKSON (ZONE)	07/1/23	Drought	0	0	$0	$0

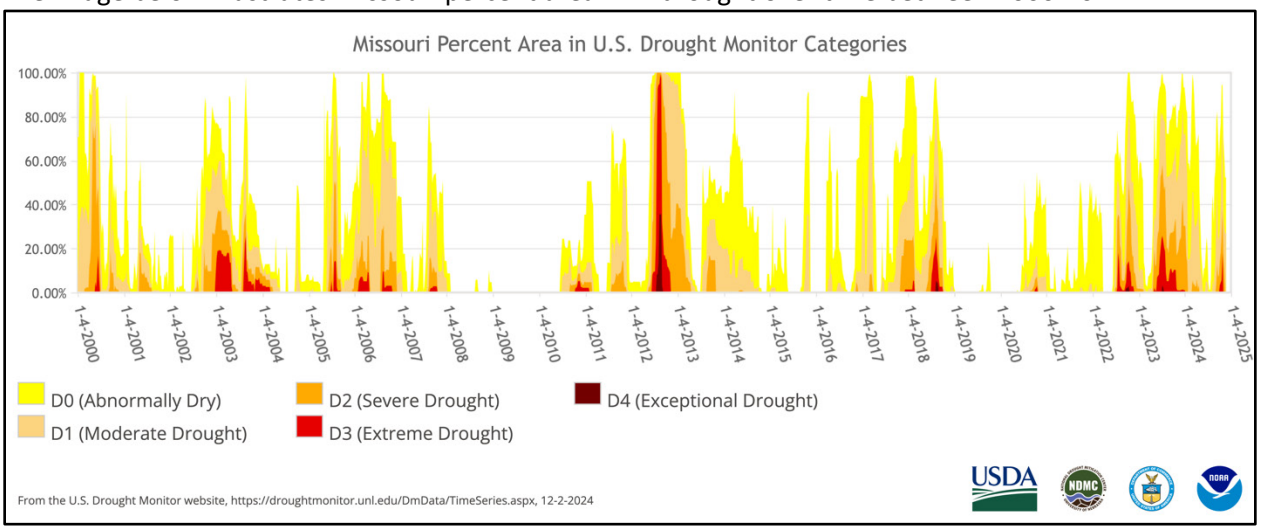
JACKSON (ZONE)	08/1/23	Drought	0	0	$0	$0
JACKSON (ZONE)	10/1/23	Drought	0	0	$0	$0
Location	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
PLATTE (ZONE)	9/27/22	Drought	0	0	$0	$0
PLATTE (ZONE)	10/1/22	Drought	0	0	$0	$0
PLATTE (ZONE)	11/1/22	Drought	0	0	$0	$0
PLATTE (ZONE)	12/1/22	Drought	0	0	$0	$0
Location	**Date**	**Event Type**	**Deaths**	**Injuries**	**Property Damage $**	**Crop Damage $**
RAY (ZONE)	9/27/22	Drought	0	0	$0	$0
RAY (ZONE)	10/1/22	Drought	0	0	$0	$0
RAY (ZONE)	11/1/22	Drought	0	0	$0	$0
RAY (ZONE)	6/20/23	Drought	0	0	$0	$0
RAY (ZONE)	7/1/23	Drought	0	0	$0	$0
RAY (ZONE)	8/1/23	Drought	0	0	$0	$0

Source: NOAA NCDC Web site

*the dollar values assigned in storm data are a basic estimate

4.12.2 Historical Trends

The image below illustrates Missouri percent area in in drought over time between 2000-2024.



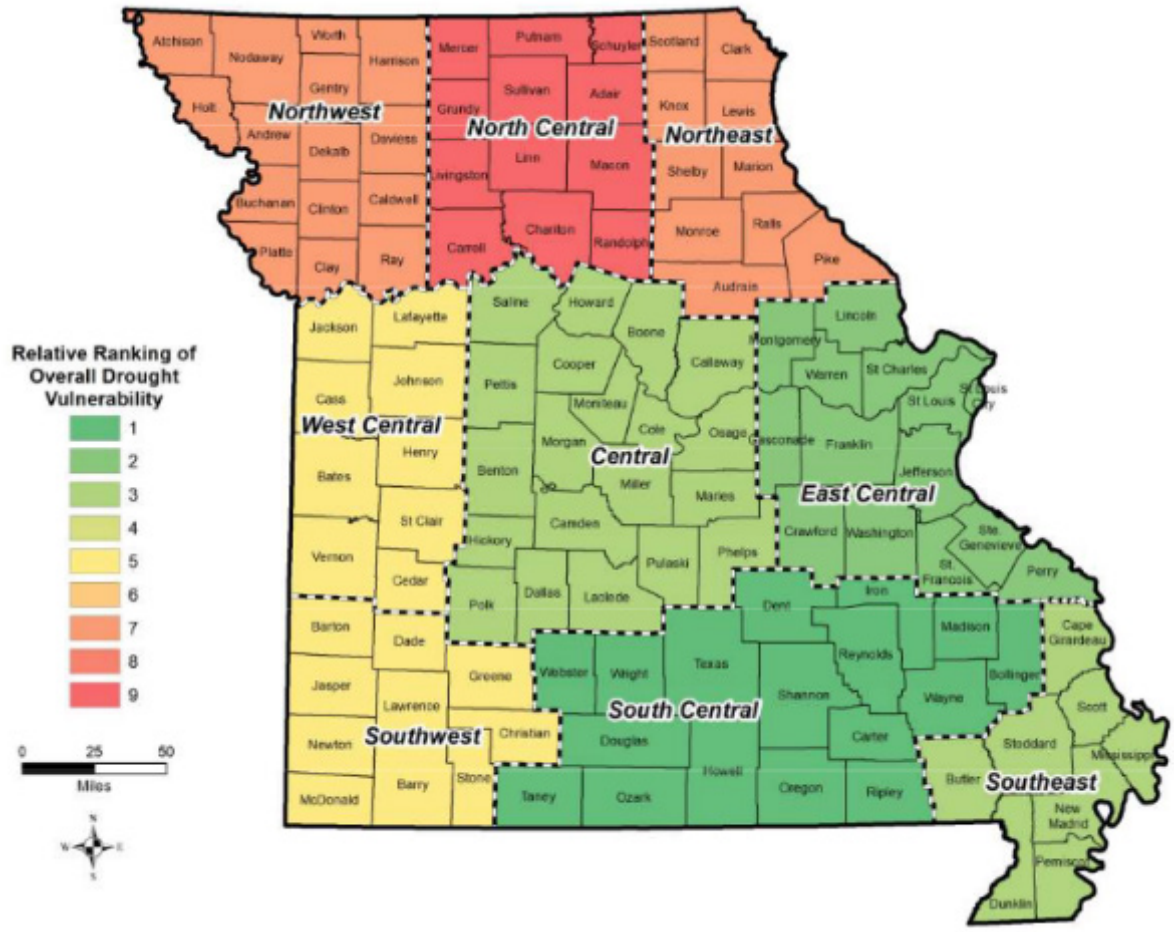
Source: NOAA NCDC Web site

4.12.3 Probable Locations

Magnitude >50%

As in the 2019 Plan, the entire planning area remains susceptible to drought. In its 2023 Missouri Drought Mitigation and Response Plan, MDNR divided the state into multiple regions. These drought regions are depicted in the map below.

The entire Kansas City region is subject to the impacts of drought. Therefore, all counites were given a >50% magnitude rating.



Source: Missouri Drought Mitigation and Response Plan, Missouri Department of Natural Resources

Map 4.12.4: Missouri's Drought Vulnerability Ranking

Specific locations within the regions described above may be susceptible to drought, based on local water supplies and/or patterns of water use. A local area's susceptibility to drought and the severity of drought conditions may also be influenced by a variety of other factors, such as historical occurrences of drought; actual annual and seasonal rainfall amounts; current and projected water demands and uses; sources of available water; water reserves and accessibility to additional water supplies; and current population and projected population trends associated with water use amounts.[iii]

4.12.4 Impact

There is not a consistent national methodology to determine the impact or severity of droughts. In response to this gap, the National Drought Mitigation Center developed the Drought Impact Reporter to fulfill the need for a national drought impact database for the United States. The Drought Impact Reporter is an interactive web-based mapping tool designed to compile and display impact information across the United States in near real-time from a variety of sources such as media, government agencies, and the public. Launched in July 2005, this tool is the only nationwide, multi-source archive of drought impact information.[iv]

Table 4.12.1 shows the number of impact reports received by the National Drought Mitigation Center from various sources. **Table 4.12.2** shows the number of valid impacts determined by the National Drought Mitigation Center using the information from reports. Impacts can be made up of one or more reports.[v]

Table 4.12.1: Drought Reports 05/19- 11/24

County	Report Category								
	Agricultural	Business and Industry	Energy	Fire	Plants and Wildlife	Relief, Response & Restrictions	Society and Public Health	Tourism & Recreation	Water Supply and Quality
Cass	2	0	0	1	4	1	2	0	4
Clay	2	0	0	0	2	4	2	0	4
Jackson	20	1	19	3	42	6	16	4	9
Platte	63	62	59	60	62	54	59	61	65
Ray	2	0	0	0	1	4	2	0	4

Source: National Drought Mitigation Center Website, Drought Impact Reporter

Table 4.12.2: Drought Impacts 05/19- 11/24									
County	Impacts Category								
	Agricultural	Business and Industry	Energy	Fire	Plants and Wildlife	Relief, Response & Restrictions	Society and Public Health	Tourism & Recreation	Water Supply and Quality
Cass	4	1	0	1	3	6	2	1	5
Clay	4	1	0	0	3	5	2	1	5
Jackson	7	3	0	1	6	6	3	1	6
Platte	4	2	0	0	3	6	2	1	6
Ray	4	1	0	0	3	5	2	1	5

Source: National Drought Mitigation Center Website, Drought Impact Reporter

4.12.4a Drought Impact Reporter Categories[vi]

Impacts and reports based on what sectors are involved. A report or an impact can have more than one category.

Agriculture – Drought effects associated with agriculture, farming, aquaculture, horticulture, forestry or ranching. Examples of drought-induced agricultural impacts include damage to crop quality; income loss for farmers due to reduced crop yields; reduced productivity of cropland; insect infestation; plant disease; increased irrigation costs; cost of new or supplemental water resource development (wells, dams, pipelines) for agriculture; reduced productivity of rangeland; forced reduction of foundation stock; closure/limitation of public lands to grazing; and the high cost or unavailability of water for livestock, Christmas tree farms, forestry, raising domesticated horses, bees, fish, shellfish or horticulture.

Business & Industry – This category tracks drought's effects on non-agriculture and non-tourism businesses, such as lawn care, recreational vehicles or gear dealers, and plant nurseries. Typical impacts include reduction or loss of demand for goods or services, reduction in employment, variation in number of calls for service, late opening or early closure for the season, bankruptcy, permanent store closure, and other economic impacts.

Energy – This category concerns drought's effects on power production, rates and revenue. Examples include production changes for both hydropower and non-hydropower providers, changes in electricity rates, revenue shortfalls and/or windfall profits, and purchase of electricity when hydropower generation is down.

Fire – Drought often contributes to forest, range, rural or urban fires, fire danger, and burning restrictions. Specific impacts include enacting or easing burning restrictions, fireworks bans, increased fire risk, occurrence of fire (number of acres burned, number of wildfires compared to average, people displaced, etc.), state of emergency during periods of high fire danger, closure of roads or land due to fire occurrence or risk, and expenses to state and county governments of paying firefighters overtime and paying equipment (helicopter) costs.

Plants & Wildlife – Drought effects associated with unmanaged plants and wildlife, both aquatic and terrestrial, include loss of biodiversity of plants or wildlife; loss of trees from rural or urban landscapes, shelterbelts, or wooded conservation areas; reduction and degradation of fish and wildlife habitat; lack

of feed and drinking water; greater mortality due to increased contact with agricultural producers, as animals seek food from farms and producers are less tolerant of the intrusion; disease; increased vulnerability to predation (from species concentrated near water); migration and concentration (loss of wildlife in some areas and too much wildlife in others); increased stress on endangered species; salinity levels affecting wildlife; wildlife encroaching into urban areas; and loss of wetlands.

Relief, Response & Restrictions – This category refers to drought effects associated with disaster declarations, aid programs, requests for disaster declaration or aid, water restrictions or fire restrictions. Examples include disaster declarations, aid programs, USDA Secretarial disaster declarations, Small Business Association disaster declarations, government relief and response programs, state-level water shortage or water emergency declarations, county-level declarations, a declared "state of emergency," requests for declarations or aid, nonprofit organization-based relief, water restrictions, fire restrictions, National Weather Service Red Flag warnings, and declaration of drought watches or warnings.

Society & Public Health – Drought effects associated with human, public and social health include health-related problems related to reduced water quantity and/or quality, such as increased concentration of contaminants; loss of human life (e.g., from heat stress, suicide); increased respiratory ailments; increased disease caused by wildlife concentrations; increased human disease caused by changes in insect carrier populations; population migration (rural to urban areas, migrants into the United States); loss of aesthetic values; change in daily activities (non-recreational, like putting a bucket in the shower to catch water); elevated stress levels; meetings to discuss drought; communities creating drought plans; lawmakers altering penalties for violation of water restrictions; demand for higher water rates; cultural/historical discoveries from low water levels; prayer meetings; cancellation of fundraising events; cancellation/alteration of festivals or holiday traditions; stockpiling water; public service announcements and drought information websites; protests; and conflicts within the community due to competition for water.

Tourism & Recreation – Drought effects associated with recreational activities and tourism include closure of state hiking trails and hunting areas due to fire danger; water access or navigation problems for recreation; bans on recreational activities; reduced license, permit, or ticket sales (e.g. hunting, fishing, ski lifts, etc.); losses related to curtailed activities (e.g. bird watching, hunting and fishing, boating, etc.); reduced park visitation; and cancellation or postponement of sporting events.

Water Supply & Quality – Drought effects associated with water supply and water quality include dry wells, voluntary and mandatory water restrictions, changes in water rates, easing of water restrictions, increases in requests for new well permits, changes in water use due to water restrictions, greater water demand, decreases in water allocation or allotments, installation or alteration of water pumps or water intakes, changes to allowable water contaminants, water line damage or repairs due to drought stress, drinking water turbidity, change in water color or odor, declaration of drought watches or warnings, and mitigation activities.[vii]

4.12.5 Probability of Future Occurrence: 20%

The onset, duration, and end of droughts are difficult to classify. Using past drought events to predict future probability is insufficient. Therefore, the weekly probability percentage of 20 percent is a very basic estimate based only on data from the National Oceanic and Atmospheric Administration storm events database (2000-2019). The combination of moderate precipitation amounts and relatively short

growing season (compared to other parts of the state), relatively high evaporation rates, deep soils, poor groundwater, reliance on surface water and historical occurrences (including current drought conditions), contribute to the region's vulnerability to drought. In many parts of the region, particularly rural areas within drought susceptibility Region C, drought conditions may have severe economic, environmental and social impacts. Mitigation measures, particularly those involving conservation and water system infrastructure improvements, may reduce the vulnerability of these areas to the effects of drought.

Another tool for monitoring drought is the United States Drought Monitor. This database allows you to download data in various categories for each week of a selected time period and location.[viii] **Table 4.12.3** below shows the probability of a D0-D4 drought occurring in more than half a county on a given week.

Due to **Table 4.12.3** including minor drought classifications like D0 and D1, the probability percentages are much higher than the probability percentage calculated from the NOAA storm events database in the previous paragraph. While many weeks experienced only D0 and D1 droughts and were not mentioned in the storm events database, **Table 4.12.4** shows that droughts at lower classification levels are still capable of damage.

Table 4.12.3 Probability of a D0-D4 Drought Occurring in a Given Week

County	Weeks with >50% of county in D0-D4 Drought	Weeks data on record	Probability
Cass	218	554	39%
Clay	209	554	38%
Jackson	202	554	36%
Platte	196	554	35%
Ray	191	554	34%
Planning Area	1,016	2,770	37%

Source: United States Drought Monitor

4.12.6 Extent

Like *section 4.12.3* mentioned, drought impacts are inherently difficult to quantify. Several methods exist for quantifying the impacts of and economic losses caused by drought in the United States. For ease of comparison, this 2020 Plan update relies on the U.S. Drought Monitoring system classification to describe drought intensity, discussed below. (The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL.)

> "Drought intensity categories are based on five key indicators, numerous supplementary indicators including drought impacts, and local reports from more than 350 expert observers around the country. The accompanying drought severity classification table **(Table 4.12.4)** shows the ranges for each indicator for each dryness level. Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what most of the indicators show and on local observations. The analysts producing the map also weigh the indices according to how well they perform in various parts of the country and at different times of the year. Additional indicators are often needed in the West, where winter snowfall in the

mountains has a strong bearing on water supplies. It is this combination of the best available data, local observations and experts' best judgment that makes the U.S. Drought Monitor more versatile than other drought indicators."[ix]

Table 4.12.4: Drought Classification							
			Ranges				
Category	**Description**	**Possible Impacts**	**Palmer Drought Severity Index (PDSI)**	**CPC Soil Moisture Model (Percentiles)**	**USGS Weekly Streamflow (Percentiles)**	**Standardized Precipitation Index (SPI)**	**Objective Drought Indicator Blends (Percentiles)**
D0	**Abnormally Dry**	Going into drought: Short-term dryness slowing planting, growth of crops of pastures Coming out of drought: some lingering water deficits pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	**Moderate Drought**	Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	**Severe Drought**	Crop or pasture losses likely Water shortages common Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	**Extreme Drought**	Major crop/pasture losses Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5

D4	Exceptional Drought	Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

4.12.7 Vulnerability Analysis

The categories described under section *4.12.3a Drought Impact Reporter Categories* (agriculture, business and industry, energy, fire, plants and wildlife, relief/response, society/public health, tourism/recreation, and water supply/quality) are all vulnerable areas in the region. Severe drought also poses health threats to citizens due to water shortages and can be exacerbated by extreme heat. Particularly vulnerable are children, the elderly, and those with respiratory problems. Contaminated or poor water quality for drinking and sanitation measures can also cause serious illnesses.[x]

4.12.8 Problem Statements

Drought will continue to impact the Kansas City region, most notably in the agricultural sector and areas of the region with high drought susceptibility. Due to the region's general abundance of potable water via the Kansas and Missouri Rivers and alluvial wells, short-term droughts are not likely to have direct, lasting impacts on the entire region, but may have meaningful impacts on individual communities. "Some preparatory measures and policies may help communities and infrastructure assets and systems (especially aging infrastructure) to cope with the impacts."[xi]

Vulnerability statements, such as those below, can support development of mitigation strategies for drought:

- Older infrastructure could be impacted by drought conditions (such as soil or substructure constriction).
- For agricultural communities, inefficient/aging irrigation systems can waste excessive amounts of water and increase the severity of drought impacts.
- Public information campaigns typically don't include water conservation measures.

4.13 Heat Waves

Almost every summer, heat waves affect the Kansas City metropolitan area. Although the entire region is affected by heat waves, the impact of these prolonged periods of heat and humidity tends to be more severe in urban areas because they absorb and retain more heat than rural or natural areas. In addition, elderly, sick and low-income residents — especially those who live in the urban core or other urbanized areas of the Kansas City region — are more susceptible to the hazards of heat waves than those who are young, healthy or have access to adequate air conditioning or ventilation.

4.13.1 Historical Occurrences

Like severe winter weather, heat waves are virtually an annual occurrence in the Kansas City metropolitan area. The region has experienced significant heat waves in the past, including record-setting periods of high temperatures, such as Aug. 4–8, 1934, when the average high temperature was 108 degrees; Aug. 12–15, 1936, with an average high temperature of 110.5 degrees (the region's record high temperature of 113 degrees occurred on Aug.14, 1936); Aug. 22–27, 1936, when the average high temperature was 105.6 degrees; and July 11–14, 1954, with an average high temperature of 110 degrees for the period.[xii] Summarized below in Table 4.13.1 is a listing of heat events from 2010 to 2018. This table includes heat events from the 2019 Plan because there have been no heat events reported to NOAA between 05/19 and 11/24.

Table 4.13.1: Heat Events (2010-2018)

Impacted County	Begin Date	End Date	Deaths	Injuries	Property Damage	Crop Damage	Additional Information
Jackson	August 2, 2010	August 14, 2010	2	0	0	0	A ridge of high pressure aloft caused unseasonably hot and humid weather settled over west central Missouri during the first two weeks of August. Excessive humidity, combined with afternoon high temperatures in the 95 to 104-degree range, caused heat index readings in the 105 to 115-degree range. As a result, an 86-year-old male and a 92-year-old female, died from the excessive heat in their apartments.
Jackson	June 28, 2012	June 30, 2012	0	0	0	0	An upper level ridge of high pressure, over the central plains, dominated the weather with hot and humid conditions, June 27th through June 30th. Afternoon heat indices were in the 100 to 105 degree range.

Clay Jackson Platte Cass	June, 26 2013	June 27, 2013	1	0	0	0	An upper level ridge of high pressure allowed hot and humid conditions to prevail across west central Missouri, on June 26th and 27th, 2013. The combination of heat and humidity caused afternoon heat indices, to be in the 100 to 106 degree range. As a result, one person in Kansas City died from the effects of the heat.
Jackson	June 10, 2015	June 11, 2015	1	0	0	0	June 10 temperatures had heat indices in the upper 90s to middle 100s. An elderly woman died as a direct cause of the heat. While the heat wave lasted only a short duration, the death was pronounced on June 15. The heat related fatality was reported to the office by a Kansas City Health Department official.

4.13.2 Probable Location

Magnitude >50%

The entire Kansas City region is subject to the impacts associated with heat waves. Therefore, all counites were given a >50% magnitude rating.

4.13.3 Impact

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the planning area, there have been 53 deaths since 1998 due to extreme heat.[xiii] Of all the other natural hazards discussed in this Plan, only extreme cold kills more Americans annually.

According to the NWS, the severity of heat-related disorders tends to increase with age. For example, heat cramps in a 17-year-old can become heat exhaustion for someone in his forties and may result in heat stroke for someone in his sixties.[xiv] **Table 4.13.2** below describes the possible impacts to health from prolonged heat exposure.

Table 4.13.2: Heat Index/Heat Disorders		
Category	**Heat Index**	**Possible heat disorders for people in higher risk groups**
Extreme Danger	130 degrees or higher (54 C or higher)	Heatstroke/sunstroke highly likely with continued exposure.
Danger	105-129 degrees (41-54 C)	Sunstroke, heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90-105 degrees (32-41 C)	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80-90 degrees (27-32 C)	Fatigue possible with prolonged exposure and/or physical activity.

In addition to heat-related illnesses, heat waves pose several other problems. Pets and livestock may suffer disorders like those experienced by humans due to prolonged exposure to heat and humidity. High demand for electricity for cooling purposes can lead to blackouts or brownouts. The resultant loss of power can lead to an even greater risk of heat-related illnesses and fatalities due to loss of cooling and ventilation. In urban areas, the opening of fire hydrants can result in a system-wide loss of water pressure. Increased water use may result in water shortages and drought-like conditions. (Heat waves commonly take place during actual droughts, as was the case in the Kansas City area and elsewhere during major droughts of the mid-1930s and mid-1950s.) Extreme heat can cause asphalt on roads and parking lots to soften and buckle. If large numbers of people are affected by heat-related illnesses, local EMS systems and hospital emergency rooms may become overwhelmed, affecting the level of care available to people. Finally, studies indicate that civil disturbances, riots and incidents of domestic violence and abuse are more likely to occur during heat waves.[xv]

4.13.4 Probability of Future Occurrence: 60%

Historical occurrences of heat waves, climatological and meteorological data, demographic data and medical statistics associated with heat-related disorders and deaths provide useful information about the people and places vulnerable to the effects of heat waves. The probability percent is based only on historical occurrences since 1998.

While recent changes in temperatures observed in Kansas City have been relatively modest, temperature is projected to increase substantially in all seasons over the remainder of this century. Heat waves will become more frequent and summer overnight lows will become hotter.

A recent study written by Dan Walker and published by MARC shows increasing annual temperatures due to climate changes. By 2100, in Kansas City:

- Average annual temperature will increase from 56.5°F to 64.4°F.
- The number of days/year in which the temperature exceeds 105°F will increase from 0.7 to 21.9.
- The number of cooling degree days, a reflection of the demand for energy needed to cool a building, will nearly double. Conversely, energy demand for heating will decline by 27 percent.

- The last spring frost is projected to be more than two weeks earlier, whereas the first fall frost will occur about 11 days later.

4.13.5 Extent

The National Weather Service defines a heat wave as a period of abnormally and uncomfortably hot and unusually humid weather. Typically, a heat wave lasts two or more days. The NWS will initiate three types of heat alert products, depending on local conditions:

Excessive Heat Outlooks – issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.

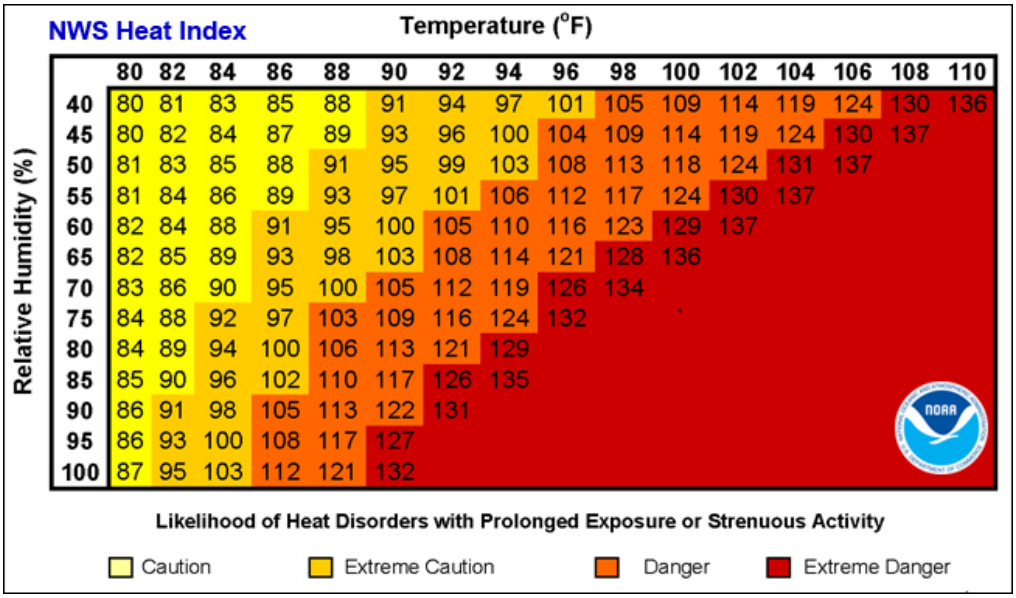
Excessive Heat Watches – issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.

Excessive Heat Warning/Advisories – issued when an excessive heat event is expected in the next 36 hours. These products are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life. Warnings are issued within 12 hours of the onset of the following criteria: 1) heat index of at least 105 degrees F for more than three hours per day for two consecutive days, or 2) heat index more than 115 degrees F for any period.[xvi]

In the Kansas City metropolitan area, these types of high temperatures generally occur between June and September but are most likely to occur in July and August. Based on data from the High Plains Regional Climate Center covering the past 64 years, from 1948 to 2012, the Kansas City metropolitan area experiences approximately 46.2 days per year above 90 degrees, with a significant number of those days with humidity levels between 50 and 70 percent.[xvii] During this period, July averaged the most days with temperatures above 90 degrees (16.1 days), followed by August with an average of 14.5, June with an average of six, and September with an average of 4.9.[xviii] According to this climatological data, the Kansas City metropolitan area is subject to heat waves during the summer months of any given year.

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. Of all the other natural hazards discussed in this Plan, only extreme cold kills more Americans annually.

In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. To provide warning about the potentially devastating effects of heat waves, the NWS devised the "Heat Index" (HI), shown in Figure 4.13.1, which is sometimes referred to as the "Apparent Temperature." The HI, given in degrees Fahrenheit, is an accurate measure of how hot it really feels when the effects of relative humidity (RH) are added to the actual air temperature.[xix]



Source: National Weather Service

Figure 4.13.1: Heat Index Degrees*

*Note: Because HI values were devised for shady, light-wind conditions, exposure to full sunshine can increase HI values by up to 15 degrees. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

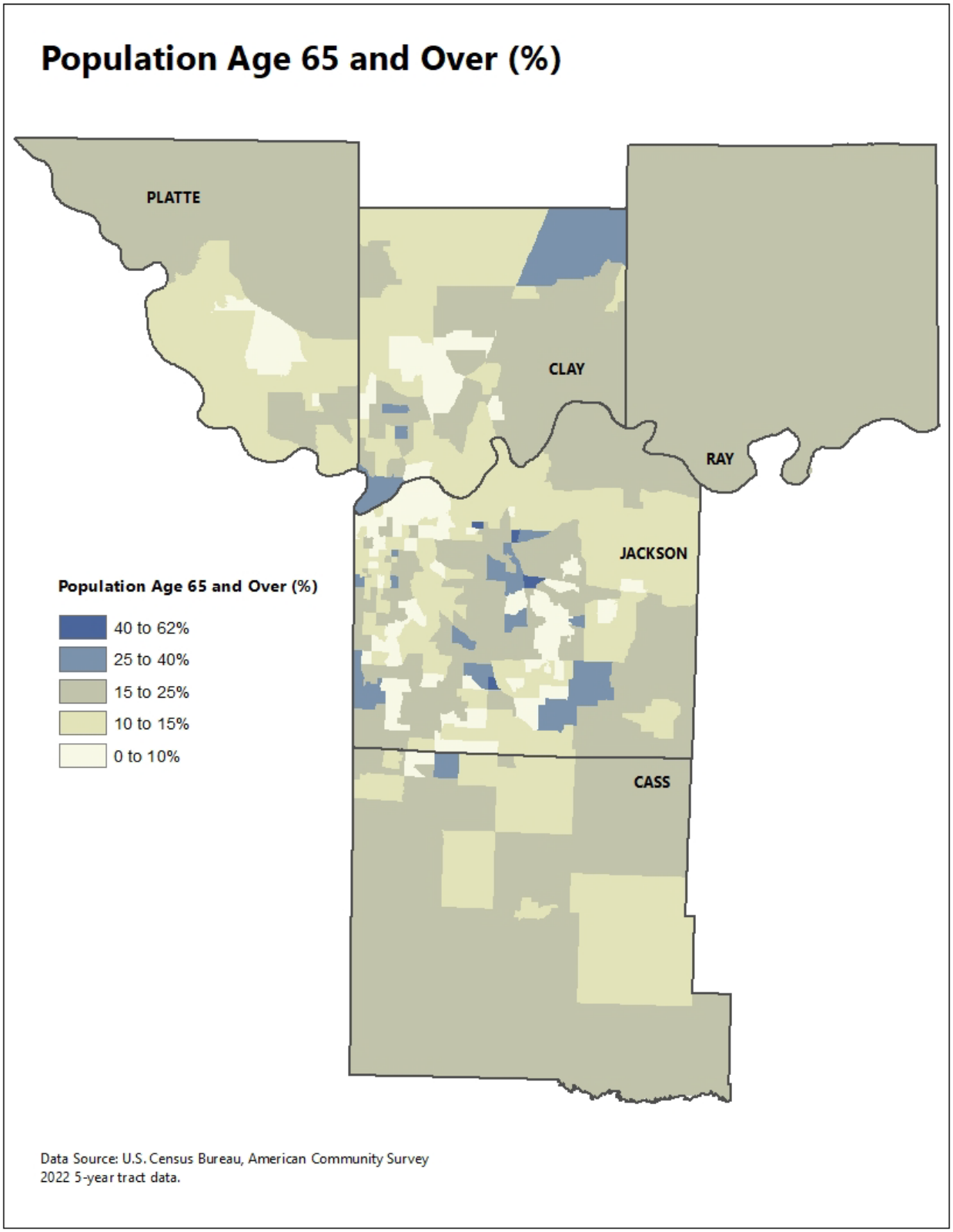
4.13.6 Vulnerability Analysis

The impact of heat waves is generally limited for most of the population in the metropolitan area, although they can be more severe for the urban areas and at-risk groups described in *Section 4.13.3*. Socioeconomic problems associated with certain urban populations exacerbate the hazards of heat waves. Many people in the urban core of Kansas City and elsewhere across the metropolitan area, especially the elderly and poor, do not have air conditioning or do not use their air conditioners because of the high cost of electricity. In addition, some residents in high crime areas, particularly the elderly, may be afraid to open their windows or venture outside to seek cooler locations. People with disabilities or other medical needs may also be more susceptible to the effects of heat waves and tend to live more in urban areas. Because of these conditions and problems, most heat-related deaths occur in cities.[xx]

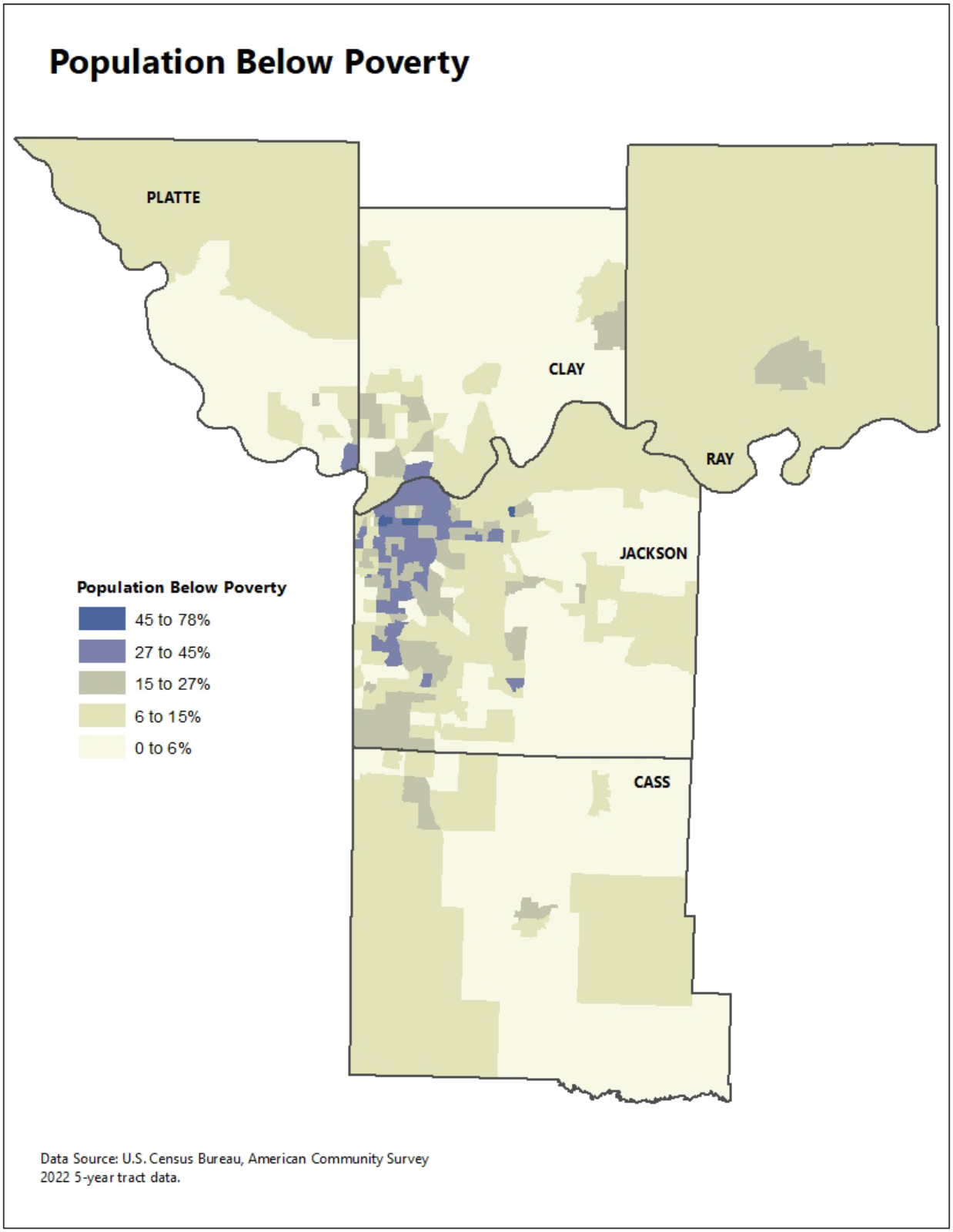
As previously mentioned, at-risk population groups are:

- People with medical/physical conditions or disabilities.
- People who work or conduct leisure activities outside.
- People who are difficult to reach through normal communications.
- People who are elderly.
- People with a lack of access to air-conditioning or other cooling mechanisms due to low incomes.

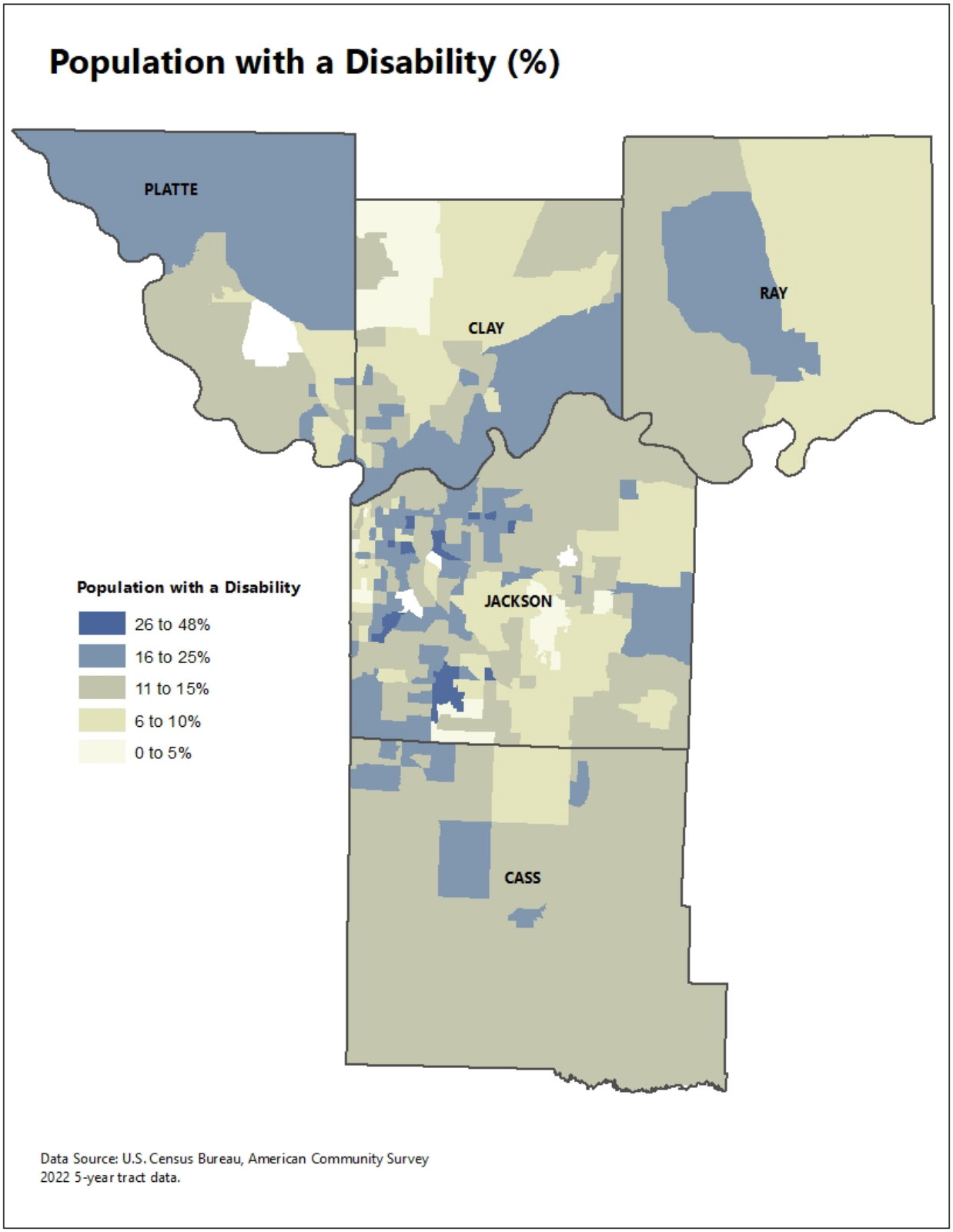
Maps 4.13.1- 4.13.3 illustrate the locations and distribution of three at-risk populations. **Map 4.13.1** depicts the population in the Kansas City metropolitan area over the age of 65. **Map 4.13.2** depicts poverty level. Map 4.13.3 depicts the disabled population in the Kansas City metropolitan area.



Map 4.13.1: Population Over age 65 in the Kansas City Metropolitan Area



Map 4.13.2: Population Below Poverty Kansas City Metropolitan Area



Map 4.13.3: Population with a Disability in the Kansas City Metropolitan Area

4.13.6 Problem Statements

Heat waves can pose a dangerous health threat to the residents of the Kansas City metropolitan area, especially at-risk population groups:

- People with medical/physical conditions or disabilities
- People who work or conduct leisure activities outside
- People who are difficult to reach through normal communications
- People who elderly
- People with a lack of access to air-conditioning or other cooling mechanisms due to low-income

Given the locations and circumstances of these populations, vulnerability statements, such as those below, can support development of mitigation strategies for heat waves:

- If not already identified, cooling centers should be strategically located to maximize coverage for those residents most vulnerable to heat waves.
- Low-income families may not have the ability to acquire or run air conditioning and may need alternative solutions to mitigate the dangers from heat waves (e.g., cooling centers).
- Those most vulnerable to heat waves are often the most difficult to reach with information or warnings about heat waves.

[i] National Drought Mitigation Center, U.S. Drought Monitor Website, http://droughtmonitor.unl.edu/
[ii] Missouri Department of Natural Resources (MDNR) Missouri Drought Mitigation and Response Plan, 2023
[iii] Drought of 2023 Final Report, MDNR Online, https://dnr.mo.gov/document-search/missouri-drought-mitigation-response-plan-2023
[iv] National Drought Mitigation Center
[v] National Drought Mitigation Center Website, Drought Impact Reporter Help Page
[vi] National Drought Mitigation Center Website
[vii] National Drought Mitigation Center Website
[viii] United States Drought Monitor, Data Download, Comprehensive Statistics, https://droughtmonitor.unl.edu/Data/DataDownload.aspx
[ix] United States Drought Monitor
[x] SEMA Hazard Mitigation Plan, pg. 3.252
[xi] Department of Homeland Security, Office of Cyber Infrastructure and Analysis, "Drought Impacts to Critical Infrastructure," April 23, 2015
[xii] Nation Master Website, www.nationmaster.com
[xiii] National Oceanic and Atmospheric Administration, Storm Events Database
[xiv] National Weather Service, Website, http://www.nws.noaa.gov/os/heat
[xv] Nation Master Website, www.nationmaster.com
[xvi] [National Weather Service, Website, http://www.nws.noaa.gov/os/heat/ww.shtml
[xvii] High Plains Regional Climate Center, Website, http://www.hprcc.unl.edu/
[xviii] High Plains Regional Climate Center, Website, http://www.hprcc.unl.edu/
[xix] National Weather Service, Website, http://www.nws.noaa.gov/os/heat
[xx] National Weather Service, Website

ATTACHMENT RISK ASSESSMENT
CASS COUNTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	44,013
Number of Schools	39
Number of Nursing Homes	10
Number of Childcare Centers	41
Number of Apartment Complexes	83
Number of Hazardous Materials locations	129
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	13

Floods

Buildings in floodplain	313
Commercial property in floodplain (parcels)	15
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	271
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	2
Dams	30
Flood events in past 5 years (NOAA)	6

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

CITY OF BELTON
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	10,284
Number of Schools	9
Number of Nursing Homes	4
Number of Childcare Centers	13
Number of Apartment Complexes	37
Number of Hazardous Materials locations	34
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	94
Commercial property in floodplain (parcels)	6
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	67
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	2
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

CITY OF HARRISONVILLE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	4,357
Number of Schools	5
Number of Nursing Homes	4
Number of Childcare Centers	7
Number of Apartment Complexes	12
Number of Hazardous Materials locations	34
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	47
Commercial property in floodplain (parcels)	10
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	32
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF LAKE WINNEBAGO
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	512
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	0
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	8
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	6
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	2
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF PECULIAR
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	2,276
Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	2
Number of Apartment Complexes	4
Number of Hazardous Materials locations	14
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	37
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	31
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF PLEASANT HILL
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	3,499
Number of Schools	5
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	10
Number of Hazardous Materials locations	15
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	10

Floods

Buildings in floodplain	98
Commercial property in floodplain (parcels)	20
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	74
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF RAYMORE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	8,783
Number of Schools	7
Number of Nursing Homes	2
Number of Childcare Centers	11
Number of Apartment Complexes	16
Number of Hazardous Materials locations	7
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	7

Floods

Buildings in floodplain	36
Commercial property in floodplain (parcels)	8
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	27
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

ARCHIE R-V SCHOOL DISTRICT
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	1,381
Number of Schools	2
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	1
Number of Hazardous Materials locations	3
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	58
Commercial property in floodplain (parcels)	4
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	54
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	5
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

HARRISONVILLE SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	5,949
Number of Schools	5
Number of Nursing Homes	4
Number of Childcare Centers	7
Number of Apartment Complexes	12
Number of Hazardous Materials locations	35
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	113
Commercial property in floodplain (parcels)	10
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	85
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	11
Flood events in past 5 years (NOAA)	2

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

PLEASANT HILL R-III SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	4,647
Number of Schools	5
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	9
Number of Hazardous Materials locations	14
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	6

Floods

Buildings in floodplain	146
Commercial property in floodplain (parcels)	35
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	102
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	4
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

RAYMORE-PECULIAR SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	15,089
Number of Schools	10
Number of Nursing Homes	2
Number of Childcare Centers	13
Number of Apartment Complexes	24
Number of Hazardous Materials locations	2
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	12

Floods

Buildings in floodplain	136
Commercial property in floodplain (parcels)	8
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	118
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	3
Flood events in past 5 years (NOAA)	2

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

SHERWOOD-CASS R-8 SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

CLAY COUNTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	105,571
Number of Schools	80
Number of Nursing Homes	21
Number of Childcare Centers	91
Number of Apartment Complexes	248
Number of Hazardous Materials locations	235
Tornado events in past 5 years (NOAA)	3

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	41

Floods

Buildings in floodplain	663
Commercial property in floodplain (parcels)	74
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	313
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	72
Dams	19
Flood events in past 5 years (NOAA)	3

Severe Winter Weather

Warming Centers	12
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	15
Heat related events in past 5 years (NOAA)	17

CITY OF EXCELSIOR SPRINGS
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	4,368
Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	17
Number of Hazardous Materials locations	9
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	4

Floods

Buildings in floodplain	33
Commercial property in floodplain (parcels)	5
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	9
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CITY OF GLADSTONE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	12,595
Number of Schools	7
Number of Nursing Homes	1
Number of Childcare Centers	9
Number of Apartment Complexes	27
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	15
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	8
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

CITY OF KEARNEY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	4,228
Number of Schools	7
Number of Nursing Homes	0
Number of Childcare Centers	7
Number of Apartment Complexes	8
Number of Hazardous Materials locations	3
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	4

Floods

Buildings in floodplain	12
Commercial property in floodplain (parcels)	3
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	5
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF LIBERTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	11,749
Number of Schools	16
Number of Nursing Homes	5
Number of Childcare Centers	17
Number of Apartment Complexes	39
Number of Hazardous Materials locations	36
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	5

Floods

Buildings in floodplain	157
Commercial property in floodplain (parcels)	25
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	90
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	5
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	3
Heat related events in past 5 years (NOAA)	17

CITY OF NORTH KANSAS CITY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	3,084
Number of Schools	1
Number of Nursing Homes	1
Number of Childcare Centers	3
Number of Apartment Complexes	24
Number of Hazardous Materials locations	39
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	68
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	38
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	37
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

CITY OF SMITHVILLE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	3,797
Number of Schools	5
Number of Nursing Homes	1
Number of Childcare Centers	7
Number of Apartment Complexes	8
Number of Hazardous Materials locations	8
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	109
Commercial property in floodplain (parcels)	25
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	49
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	2
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

EXCELSIOR SPRINGS SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	6,592
Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	17
Number of Hazardous Materials locations	24
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	10

Floods

Buildings in floodplain	306
Commercial property in floodplain (parcels)	24
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	180
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	17
Flood events in past 5 years (NOAA)	2

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

NORTH KANSAS CITY SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	59,743
Number of Schools	32
Number of Nursing Homes	8
Number of Childcare Centers	47
Number of Apartment Complexes	157
Number of Hazardous Materials locations	28
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	13

Floods

Buildings in floodplain	775
Commercial property in floodplain (parcels)	42
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	625
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	70
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	5
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	6
Heat related events in past 5 years (NOAA)	17

SMITHVILLE R-II SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	5,411
Number of Schools	5
Number of Nursing Homes	1
Number of Childcare Centers	7
Number of Apartment Complexes	8
Number of Hazardous Materials locations	8
Tornado events in past 5 years (NOAA)	2

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	146
Commercial property in floodplain (parcels)	34
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	77
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	3
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

JACKSON COUNTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	330,584
Number of Schools	260
Number of Nursing Homes	85
Number of Childcare Centers	350
Number of Apartment Complexes	1,950
Number of Hazardous Materials locations	637
Tornado events in past 5 years (NOAA)	2

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	15

Floods

Buildings in floodplain	188
Commercial property in floodplain (parcels)	7
Commercial property in floodplain (area)	60
Residential property in floodplain (parcels)	121
Residential property in floodplain (value)	5
Residential property in floodplain (area)	132
Hazardous materials locations in floodplain	188
Dams	7
Flood events in past 5 years (NOAA)	60

Severe Winter Weather

Warming Centers	41
Severe winter weather in past 5 years (NOAA)	6

Heat

Cooling Centers	59
Heat related events in past 5 years (NOAA)	17

CITY OF BLUE SPRINGS
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	22,434
Number of Schools	22
Number of Nursing Homes	7
Number of Childcare Centers	27
Number of Apartment Complexes	61
Number of Hazardous Materials locations	31
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	7

Floods

Buildings in floodplain	32
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	25
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	2
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	4
Heat related events in past 5 years (NOAA)	17

CITY OF GRANDVIEW
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	11,897
Number of Schools	7
Number of Nursing Homes	2
Number of Childcare Centers	16
Number of Apartment Complexes	45
Number of Hazardous Materials locations	19
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	30
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	22
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CITY OF GREENWOOD
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	14,088
Number of Schools	1
Number of Nursing Homes	0
Number of Childcare Centers	4
Number of Apartment Complexes	2
Number of Hazardous Materials locations	7
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF GRAIN VALLEY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

CITY OF INDEPENDENCE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	55,913
Number of Schools	45
Number of Nursing Homes	9
Number of Childcare Centers	42
Number of Apartment Complexes	134
Number of Hazardous Materials locations	88
Tornado events in past 5 years (NOAA)	2

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	15

Floods

Buildings in floodplain	894
Commercial property in floodplain (parcels)	37
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	650
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	9
Dams	2
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	7
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	12
Heat related events in past 5 years (NOAA)	17

CITY OF KANSAS CITY, MO
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	241,827
Number of Schools	191
Number of Nursing Homes	52
Number of Childcare Centers	238
Number of Apartment Complexes	1,678
Number of Hazardous Materials locations	536
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	55

Floods

Buildings in floodplain	2,287
Commercial property in floodplain (parcels)	263
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	900
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	138
Dams	24
Flood events in past 5 years (NOAA)	5

Severe Winter Weather

Warming Centers	26
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	38
Heat related events in past 5 years (NOAA)	17

CITY OF LEE'S SUMMIT
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	40,716
Number of Schools	32
Number of Nursing Homes	11
Number of Childcare Centers	53
Number of Apartment Complexes	89
Number of Hazardous Materials locations	60
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	24

Floods

Buildings in floodplain	131
Commercial property in floodplain (parcels)	3
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	77
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	8
Flood events in past 5 years (NOAA)	3

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CITY OF LEVASY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

CITY OF OAK GROVE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	6,150
Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	49
Number of Hazardous Materials locations	17 (# of Tornado Warnings)
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	3
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	3
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	
Dams	0
Flood events in past 5 years (NOAA)	7

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	8

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	8

CITY OF RAYTOWN
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	13,647
Number of Schools	10
Number of Nursing Homes	4
Number of Childcare Centers	8
Number of Apartment Complexes	54
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	23
Commercial property in floodplain (parcels)	12
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	10
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CENTRAL JACKSON COUNTY FIRE PROTECTION DISTRICT
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	
Number of Schools	25
Number of Nursing Homes	7
Number of Childcare Centers	31
Number of Apartment Complexes	69
Number of Hazardous Materials locations	39
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	240
Commercial property in floodplain (parcels)	20
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	189
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	7
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	5
Heat related events in past 5 years (NOAA)	17

SNI VALLEY FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	6,150
Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	49
Number of Hazardous Materials locations	14
Tornado events in past 5 years (NOAA)	17 (# of tornado warnings)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	12
Commercial property in floodplain (parcels)	
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	
Dams	3
Flood events in past 5 years (NOAA)	7

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	8

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	8

BLUE SPRINGS SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	36,809
Number of Schools	22
Number of Nursing Homes	9
Number of Childcare Centers	36
Number of Apartment Complexes	83
Number of Hazardous Materials locations	2
Tornado events in past 5 years (NOAA)	2

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	159
Commercial property in floodplain (parcels)	4
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	123
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	3
Dams	159
Flood events in past 5 years (NOAA)	4

Severe Winter Weather

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	4
Heat related events in past 5 years (NOAA)	17

FORT OSAGE R-1 SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	9,711
Number of Schools	9
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	12
Number of Hazardous Materials locations	0
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	4

Floods

Buildings in floodplain	349
Commercial property in floodplain (parcels)	55
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	180
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	12
Dams	10
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

GRAIN VALLEY SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	8,309
Number of Schools	7
Number of Nursing Homes	0
Number of Childcare Centers	7
Number of Apartment Complexes	17
Number of Hazardous Materials locations	4
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	142
Commercial property in floodplain (parcels)	12
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	106
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

INDEPENDENCE SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	46,141
Number of Schools	30
Number of Nursing Homes	8
Number of Childcare Centers	36
Number of Apartment Complexes	118
Number of Hazardous Materials locations	65
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	12

Floods

Buildings in floodplain	951
Commercial property in floodplain (parcels)	62
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	813
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	5
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	9
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	14
Heat related events in past 5 years (NOAA)	17

KANSAS CITY SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	113,216
Number of Schools	33
Number of Nursing Homes	37
Number of Childcare Centers	122
Number of Apartment Complexes	1,389
Number of Hazardous Materials locations	78
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	18

Floods

Buildings in floodplain	1,097
Commercial property in floodplain (parcels)	575
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	436
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	96
Dams	2
Flood events in past 5 years (NOAA)	3

Severe Winter Weather

Warming Centers	17
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	25
Heat related events in past 5 years (NOAA)	17

LEE'S SUMMIT SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	42,826
Number of Schools	29
Number of Nursing Homes	11
Number of Childcare Centers	49
Number of Apartment Complexes	85
Number of Hazardous Materials locations	10
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	25

Floods

Buildings in floodplain	213
Commercial property in floodplain (parcels)	11
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	136
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	26
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

OAK GROVE R-VI SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	4,104
Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	6
Number of Apartment Complexes	25
Number of Hazardous Materials locations	8
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	22
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	14
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	22
Flood events in past 5 years (NOAA)	2

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

METROPOLITAN COMMUNITY COLLEGES SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

PLATTE COUNTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	45,378
Number of Schools	36
Number of Nursing Homes	12
Number of Childcare Centers	29
Number of Apartment Complexes	110
Number of Hazardous Materials locations	136
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	9

Floods

Buildings in floodplain	262
Commercial property in floodplain (parcels)	14
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	131
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	26
Dams	16
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	9
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	12
Heat related events in past 5 years (NOAA)	17

CITY OF FARLEY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	91
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	1
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF LAKE WAUKOMIS
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	492
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	0
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF NORTHMOOR
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	144
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	1
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	33
Commercial property in floodplain (parcels)	5
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	1
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF PARKVILLE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	2,958
Number of Schools	1
Number of Nursing Homes	1
Number of Childcare Centers	2
Number of Apartment Complexes	18
Number of Hazardous Materials locations	8
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	51
Commercial property in floodplain (parcels)	28
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	4
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	2
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CITY OF PLATTE CITY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	2,067
Number of Schools	4
Number of Nursing Homes	1
Number of Childcare Centers	8
Number of Apartment Complexes	15
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	2

Floods

Buildings in floodplain	1
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	1
Dams	1
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	3
Heat related events in past 5 years (NOAA)	17

CITY OF PLATTE WOODS
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	228
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	2
Number of Apartment Complexes	0
Number of Hazardous Materials locations	0
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF RIVERSIDE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	1,667
Number of Schools	1
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	17
Number of Hazardous Materials locations	22
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	40
Commercial property in floodplain (parcels)	12
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	6
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	18
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

CITY OF TRACY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	84
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	0
Number of Hazardous Materials locations	2
Tornado events in past 5 years (NOAA)	

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	0

Floods

Buildings in floodplain	1
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	1
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF WEATHERBY LAKE
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	967
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	0
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	4
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	3
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	0
Heat related events in past 5 years (NOAA)	17

CITY OF WESTON
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	854
Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	2
Number of Hazardous Materials locations	6
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	1

Floods

Buildings in floodplain	23
Commercial property in floodplain (parcels)	8
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	6
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	2
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

NORTHLAND REGIONAL AMBULANCE DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

WEST PLATTE FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	
Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	2
Number of Hazardous Materials locations	4
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	45
Commercial property in floodplain (parcels)	13
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	19
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	2
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

NORTH PLATTE R-1 SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	1,757
Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	1
Number of Hazardous Materials locations	6
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	5

Floods

Buildings in floodplain	41
Commercial property in floodplain (parcels)	9
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	27
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	4
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	3
Heat related events in past 5 years (NOAA)	17

PARK HILL SCHOOL DISTRICT
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	32,136
Number of Schools	21
Number of Nursing Homes	7
Number of Childcare Centers	19
Number of Apartment Complexes	80
Number of Hazardous Materials locations	24
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	12

Floods

Buildings in floodplain	427
Commercial property in floodplain (parcels)	86
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	290
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	19
Dams	3
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	4
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	5
Heat related events in past 5 years (NOAA)	17

PLATTE COUNTY R-3 DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	11,401
Number of Schools	7
Number of Nursing Homes	7
Number of Childcare Centers	10
Number of Apartment Complexes	37
Number of Hazardous Materials locations	8
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	8

Floods

Buildings in floodplain	40
Commercial property in floodplain (parcels)	3
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	17
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	7
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	4
Heat related events in past 5 years (NOAA)	17

WEST PLATTE R-II SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	1,718
Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	2
Number of Hazardous Materials locations	10
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	3

Floods

Buildings in floodplain	156
Commercial property in floodplain (parcels)	22
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	75
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	3
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	1
Heat related events in past 5 years (NOAA)	17

PARK UNIVERSITY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units

Number of Schools

Number of Nursing Homes

Number of Childcare Centers

Number of Apartment Complexes

Number of Hazardous Materials locations

Tornado events in past 5 years (NOAA)

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)

Floods

Buildings in floodplain

Commercial property in floodplain (parcels)

Commercial property in floodplain (area)

Residential property in floodplain (parcels)

Residential property in floodplain (value)

Residential property in floodplain (area)

Hazardous materials locations in floodplain

Dams

Flood events in past 5 years (NOAA)

Severe Winter Weather

Warming Centers

Severe winter weather in past 5 years (NOAA)

Heat

Cooling Centers

Heat related events in past 5 years (NOAA)

RAY COUNTY
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	9,388
Number of Schools	11
Number of Nursing Homes	2
Number of Childcare Centers	8
Number of Apartment Complexes	11
Number of Hazardous Materials locations	44
Tornado events in past 5 years (NOAA)	1

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	6

Floods

Buildings in floodplain	562
Commercial property in floodplain (parcels)	25
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	504
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	4
Dams	19
Flood events in past 5 years (NOAA)	1

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

CITY OF RICHMOND
SUMMARY ASSESSMENT OF RISKS

Tornadoes

Number of Housing Units	2,847
Number of Schools	4
Number of Nursing Homes	2
Number of Childcare Centers	7
Number of Apartment Complexes	9
Number of Hazardous Materials locations	19
Tornado events in past 5 years (NOAA)	0

Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	4

Floods

Buildings in floodplain	45
Commercial property in floodplain (parcels)	7
Commercial property in floodplain (area)	
Residential property in floodplain (parcels)	30
Residential property in floodplain (value)	
Residential property in floodplain (area)	
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

Severe Winter Weather

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	

Heat

Cooling Centers	2
Heat related events in past 5 years (NOAA)	17

Chapter 5: Mitigation Strategy

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Chapter 5: Mitigation Strategy

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.*

5.1 Updates to the 2020 Plan Mitigation Goals and Actions

This section of the plan focuses on the mitigation strategies developed by each participating jurisdiction to reduce or avoid long-term vulnerabilities to the five identified natural hazards (severe thunderstorms, severe winter weather, severe heat/drought, high winds/tornadoes and flooding). For continuing participants from the 2020 Plan, each of the jurisdictions' mitigation goals and actions identified in the 2020 Plan were reviewed for relevance and updated with current status. New participants provided goals and mitigation actions beginning in 2025. Continuing and new participants are noted within the mitigation strategies section **(Attachment 1)**.

These mitigation actions were activities that stakeholders in the hazard mitigation planning process, especially local governments, could implement over a five-year period. Many of the actions were intended to be implemented in a relatively short period of time, generally less than two years, using existing organizations and resources in each county or across the region. Other actions required a longer implementation timeframe, perhaps two to five years or longer, as well as additional resources, particularly funding. Most actions require new resources that local jurisdictions may need to secure before implementation is possible.

For the Hazard Mitigation Plans beginning with the 2015 one, an online database was created to allow jurisdictions to evaluate hazards and corresponding mitigation goals and actions for their community. Jurisdictions were instructed to complete information on goals and actions for hazards that were identified threats to their community. For each mitigation action, jurisdictions were asked to designate a project's status as completed, deleted, deferred or ongoing. If the action was completed, jurisdictions were asked to provide a date of completion. For those deleted or deferred, jurisdictions were asked to provide a narrative explanation. If a project was marked as ongoing, further information was requested to document the current status and expected future effort.

The Hazard Mitigation Plan steering committee determined that "priority" should be ranked on a qualitative scale of high, medium and low and jurisdictions were instructed to consider a generic cost/benefit analysis when ranking mitigation actions.

High-priority actions were those for which resources, manpower, political capital, etc., are readily available to accomplish the actions and should generally be accomplished within two years. Medium-priority actions were those that are desirable, but due to various planning limitations, weren't expected to be implemented for two to five years. Low-priority actions were those that weren't scheduled to be implemented in the near future (greater than five years). Actions deleted or deferred were either no longer applicable or regarded as "failing" the cost/benefit analysis.

The mitigation goals and actions were prepared considering the increasing concern over changing climate conditions and the cost of repairing damage and losses from disasters. Many of the cities and counties have updated building codes, adopted infrastructure standards and invested in capital

improvements to reduce risks from natural hazards. Many of the school districts in the region have taken steps in their plans, policies and capital improvements to reduce risks from active shooters, improved sheltering of students and employees, and warning systems.

5.1.1. Changes to 2020 Mitigation Goals and Actions Database for 2025 Plan Update

For this 2025 Plan update, continuing participants used their 2020 goals and mitigation actions as a starting point. The database for mitigation actions includes:

- Type of Mitigation Activity – *optional* field to describe if the action related to Natural Systems protection, Structure and Infrastructure Projects, Local Plans and Regulations or Education and Awareness Programs
- Cost / Benefit Review – *required* field to discuss a benefit-cost review of each action as part of the evaluation and prioritization process to determine if costs are reasonable compared to probable benefits. Jurisdictions could use cost estimates based on experience and judgment and discuss benefits as losses avoided (such as the number and value of structures and infrastructure protected by the action and the population protected from injury and loss of life). Qualitative benefits, such as quality of life and natural and beneficial functions of ecosystems could also be used for the review.
- Target Capacity – *optional* field to project the extent of population or infrastructure the action is intended to serve/protect/mitigate.

5.1.1a. Prioritization of Mitigation Actions

The chronological ranking method[i] of prioritizing mitigation goals and actions (based on implementation timeframes) used for the past two Plans (2015 and 2020) were again used for this update and defined as:

- Low-Priority Actions -- those not scheduled to be implemented in the near future (greater than five years). Many jurisdictions removed some of these actions from prior plans given low expectations that resources or other support might be available to implement.
- Medium-Priority Actions – those that are desirable but due to various planning limitations, are not expected to be implemented for two to five years.
- High-Priority Actions: -- those for which resources, manpower, political, capital etc. are readily available to accomplish the action within the next one to two years. With the exception of larger jurisdictions with more resources (including ability to seek and secure FEMA or other grant funds), some high priority actions in previous years are seen as difficult for smaller cities and school districts.

Jurisdictions considered the results of the hazard profiles and their current capabilities to protect and mitigate natural hazards. They also looked at actions taken previously, 2020 goals and strategies, and projects that could be supported with FEMA pre-disaster or hazard mitigation grants. Local jurisdictions also considered the increase in risks due to changing climate conditions. The increased concern over severe weather events due to climate change became an increased consideration for mitigation goals and actions.

5.1.1b Cost Estimates for Mitigation Action

Unless a proposed mitigation action is included in a jurisdiction's comprehensive, strategic or capital improvements plan, it was difficult to estimate costs. Some education actions could be implemented at a low cost. Although policies could be developed and adopted at low cost, the impact of certain policies could be of greater cost to either the jurisdiction or public or private organizations in the community. (e.g., the cost of building codes to increase resistance to high winds or strengthened energy conservation codes could result in more expensive building costs). The jurisdictions were asked to consider low, medium or high costs, recognizing that such terms are relative based on the budgets and other resources for each jurisdiction. Additionally, jurisdictions were asked to consider whether the costs were one-time or recurring.

5.1.1c Status of Jurisdictional 2015 and 2020 Goals and Actions

As noted above, continuing jurisdictions were required to review the status of their goals and actions and make changes, as appropriate. Attachments 1 and 2 is the consolidated listing of all participating jurisdictions' mitigation goals and actions and reflects the most current status of their goals and actions. Each action is designated as Completed (from previous plans), New for 2025 or Ongoing. A few actions are Undetermined indicating that the local jurisdiction is still considering the appropriateness of the action for the 2025 plan.

5.1.2 Updates to School District/College/University 2025 Mitigation Goals and Actions

Those school districts and colleges and universities that participated in the 2020 plan were asked to review their 2020 goals and strategies similarly to cities and counties. For school districts that did not participate in 2020, they were asked to identify goals and strategies for the 2025 plan. These have been consolidated in Attachment 2 in a table format and include the same information elements discussed above that cities and counties were required to complete.

5.2 Mitigation Goals and Actions for 2025 Plan

Jurisdictions that participated in the 2020 plan were invited to participate in the 2025 plan. In addition, cities and school districts that did not participate in 2020 were invited to be a part of the plan. Continuing participants were encouraged to develop new goals and actions using the online tool (or an excel spreadsheet). Some jurisdictions chose to add new goals and actions, others elected to continue focusing on previously identified strategies. Both the old (2020) and new (2025) mitigation goals and actions were consolidated into **Attachment 2**. The column labeled "Plan year" indicates if the goal or action is from the 2020 plan or newly added as part of the 2025 update. New goals continue to mirror the numbered list from the 2020 goals and actions (see Attachment 1), but new actions are unnumbered, both to avoid confusion and denote them as new actions.

5.3 Implementation of the National Flood Insurance Program (NFIP)

Requirement §201.6(c)(3)(ii): *[The hazard mitigation strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirement, as appropriate.*

In accordance with regulatory requirements, all hazard mitigation plans must describe each jurisdiction's participation in the NFIP by identifying, analyzing and prioritizing actions related to continued compliance with the NFIP. These three basic components include:

1) Adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs);

2) Floodplain identification and mapping, including any local requests for map updates; or

3) Description of community assistance and monitoring activities

Three sections of this 2025 updated plan were developed to show compliance with the above requirements: 1) and 3) The Local Capabilities Section (Section 3, table 3.7) shows which jurisdictions have floodplain management plans or ordinances in effect and describe community assistance and monitoring activities where applicable. 2) Floodplains were identified and mapped for all participating jurisdictions as part of the Flood risk assessment and are available as part of the data layers for the online planning tool (Refer to Section 4.5.4).

1) Floodplain management

<u>Discourage new development in floodplains and flood-prone areas.</u>

a.) Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas. (Almost every incorporated city/town and every county in the 5-county Planning Area have joined the federal flood insurance program and adopted an ordinance prohibiting developing in the 100-year floodplain unless conditions to address risk are met).

b.) Consider using the 500-year floodplain rather than the 100-year floodplain or consider adopting a stream setback ordinance. A number of communities have adopted stream setback ordinances (Table 3.7) and a number have adopted Stormwater Management Plans (Table 3.1).

c.) Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.

d.) Consider fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.

<u>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</u>

a.) Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS). All cities and counties participating in the 2025 plan participate in the NFIP (Table 3.23). Four jurisdictions – Independence, Kansas City, Blue Springs and Platte County – participate in the Community Rating System. (Table 3.30).

b.) Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents. Evaluate current and planned development in areas where risks from flooding have increased due to changes in the FIRMs.

c.) Designate a Floodplain Manager and support training to become certified.

2) Floodplain identification and mapping

Improve flood hazard assessments and flood mapping.

a.) Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.

b.) Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.

c.) Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.

d.) Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems. Where appropriate work with MARC to support both local and regional mapping and analysis.

e.) Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.

3) Community assistance and monitoring activities

Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.

a.) Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.

b.) Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.

c.) As funding allows, repetitive flood loss properties and structures will be targeted for buyout.

d.) With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses

Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.

a.) Identify incentives to offer property owners to remove or retrofit structures in flood-prone areas.

b.) Encourage cities and counties to adopt the new APWA Stormwater Management Design Standards expected to be completed in mid-2025.

The Metropolitan Emergency Managers Committee has committed to review the Hazard Mitigation Plan annually and assist local jurisdictions with updated information and guidance to maintain the plan and to consider steps to integrate the HMP into other plans and policies. The Kansas City region is preparing a 2025 update to the Regional Climate Action Plan (KC Climate Coalition with support from MARC) and the results of that analysis will be used to engage local officials to take more proactive steps to mitigate risks from natural hazards.

5.4 Attachments

Attachment 5.1: Community Mitigation Goals and Actions

Attachment 5.2: School Mitigation Goals and Actions

[i] FEMA *Local Mitigation Planning Handbook,* 6-B, March 2013

2025 Cass County Emergency Mgmt Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Reduce vulnerability and enhance community situational awareness										
Implement a community-wide weather radio distribution program, prioritizing vulnerable and rural populations. 200 radios 100 Light and Pillow shaker kits	2025	New, reviewed in 2025	2025 goals based on budget or grants to be obtained	Education and Awareness Programs	Medium	July 2026	$17,000	Emergency Mgt	$17,000	BRIC, HMGP, FMA; Local Budgeted Funds
Floods										
Implement a comprehensive flood monitoring system to enhance early warning capabilities and reduce flood-related risks										
Implement a cloud-based dashboard/map that will visually allow the public and local government to see flood-affected areas. This dashboard will be connected to several water-level sensors throughout the county.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	Medium	N/A	High	Emergency Mgt	High	BRIC, HMGP, FMA
Improve signage for flood areas to a solar lighted sign and water level sensors to provide better visibility and awareness.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	Medium	N/A	Medium	Emergency Mgt	Medium	Local Budgeted Funds and Staff Time
Work with Public Works and gather data from other sources for recurring localized flood areas in the county.	2025	New, reviewed in 2025	Will attempt to start this action in early 2025	Other	Medium	N/A	Medium	Emergency Mgt and Public Works	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Promote use / sign up of Mass notification										
Using social media campaigning to educate the public on the availability of the county mass notification system.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	N/A	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Winter weather public preparedness										
Work with local cities to identify and map local warming centers	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	N/A	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Work with the county health department to create a social media campaign for winter weather safety	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	N/A	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Extreme Temperatures										
Develop education and safety messaging for heat-related weather										
Create and post a map of cooling shelters	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	N/A	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Social media campaign for safety messages to the public on preventing heat-related injuries.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	N/A	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time

2025 City of Belton, Missouri Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Enhance community preparedness for tornadoes through targeted outreach and education.										
Establish a Community Emergency Response Team (CERT) trained for tornado response.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Work with the school district to ensure tornado preparedness plans are regularly updated and exercised.	2025	New, reviewed in 2025			Medium	Ongoing	Medium	Emergency Mgt	Low	Local Budgeted Funds and Staff Time

2025 City of Harrisonville, MO Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Community Storm Shelter										
Identify two strategic locations inside the city limits of Harrisonville.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	High	Emergency Mgt.	Low	General Funds, City of Harrisonville, MO; Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	General Funds, City of Harrisonville, MO
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	General Funds, City of Harrisonville, MO
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	General Funds, City of Harrisonville, MO
Partner w/ trade orgs. to conduct safe room workshops.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	General Funds, City of Harrisonville, MO
Upgrade outdoor warning Sirens										
Floods										
Improve hazard assessment information for dams across the Kansas City metropolitan area.										
Include maps and information from inundation studies and dam emergency action plans in local emergency operations and land use plans.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	Medium	USACE and City of Harrisonville
Obtain assessed valuation data and population figures for areas in the vicinity of dam inundation pathways so that enhanced vulnerability assessments may be conducted describing the number of lives and amount of property at risk from dam failure.	2025	New, reviewed in 2025	USACE completed innundation analysis of Town Creek Dams	Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	Medium	USACE and City of Harrisonville

Lake Annette 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Ensure the community has shelters to accommodate residents and visitors during tornadoes/natural hazards.										
Retrofit or add shelters to existing public/critical facilities.	2020	continuing	No public building; community center no longer an option	Structure and Infrastructure Projects	Medium	TBD as funds are available	Will better ensure safety of residents	board of aldermen	High	TBD
Improve tornado warning capabilities.										
Install outdoor warning sirens	2020	completed	Will work with fire dept to determine best option for community	Structure and Infrastructure Projects	Medium	TBD as funds are available	Will better ensure safety of residents	board of aldermen	Medium	TBD
Floods										
Discourage new development in floodplains and flood-prone areas.										
Identify damaged properties and seek grant funds to acquire and demolish the structures and use property for public open space	2025	new	have a number of vacant flood damaged properties in need of	Structure and Infrastructure Projects	High	as funds are available	will prevent future flood impacts on lives and proerty	board of aldermen	High	Grants through FEMA or CDBG
Implement or improve flood warning systems.										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	ongoing	Explore ordinances and policies that may require attorney and	Local Plans and Regulations	High	1-2 years	Will ensure that citizens are prepared real time for flood events.	board of aldermen	Low	Local funds; possible grant funds
Install outdoor warning sirens	2020	ongoing	Will work with fire dept to determine best	Structure and Infrastructure Projects	Medium	TBD as funds are available	Will better ensure safety of residents	board of aldermen	Medium	Grants through FEMA or CDBG
Increase communication with NWS for timely reporting	2020	ongoing		Local Plans and Regulations	High	1-2 years	Low/no cost mechanism to increase public safety.	board of aldermen	Low	Local
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Continue to participate in the National Flood Insurance Program (NFIP)	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Part of city operation	board of aldermen	Low	Local

2025 Lake Winnebago Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	While may increase building costs, will lead to greater occupant safety	building official	Medium	building permits
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	While may increase building costs, will lead to greater occupant safety	building official	Medium	building permits
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	While may increase building costs, will lead to greater occupant safety	building official	Low	building permits
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Low/no cost mechanism to increase public safety.	building official	Low	fees for building permits
Floods										
Discourage new development in floodplains and flood-prone areas.										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Completed	We do not allow building in the flood plain.	Local Plans and Regulations	Unspecified	N/A	Medium	building official	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to evaluate flood risk	engineer	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Local Plans and Regulations	High	Ongoing	Will ensure homeowners and businesses are protected.	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	Will ensure latest copies of flood maps are on hand to guide development and mitigation strategies.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Local Plans and Regulations	Medium	N/A	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	board of aldermen	Medium	property owner

Peculiar 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*									
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes and Severe Thunderstorms									
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.									
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness	High	No/low cost mechanism to increase public safety.	building official	Low	Local city resources
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.									
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Plans and Policies	High	could save lives	building official	Medium	FEMA HMP and BRIC grants
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness	High	No/low cost mechanism to increase public safety.	emergency manager	High	Local city resources
Increase public awareness and understanding the benefits of "safe rooms."									
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Education and Awareness	Medium	could save lives	emergency manager	Low	Local city resources
Floods									
Enhance public awareness and education efforts related to flooding.									
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Education and Awareness	High	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	Low	Local city resources
Improve flood hazard assessments and flood mapping.									
Coordinate the collection of demographic, economic, watershed, land use and other data and/or GIS systems.	2010	Ongoing		Plans and Policies	Medium	available and can be easily imported to identify potential areas	planning and public works	Medium	Public Works, Capital, Water and Wastewate Utilty Funds
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.									
greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing		Structure & Infrastructure	Medium	new downstream conditions are better than existing	planning and public works	High	Provided by development
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and i	2010	Ongoing		Education and Awareness	Medium	No/low cost mechanism to increase public safety.	planning and public works	Low	Local city resources
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.									
Participate in the National Flood Insurance Program (NFIP) .	2010	Ongoing		Plans and Policies	High	Will ensure reduced insurance rates for homeowners and	floodplain manager	Low	Local city resources
Extreme Temperatures and Severe Winter Weather									
Educate the public about steps to reduce risks to life and property	2025	New		Education and Awareness	Medium	help to protect lives	planning and public works	Low	local city resources

2025 Pleasant Hill Mitigation Strategy

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Have a plan to deploy resources to all affected areas	2025	New		Local Plans and Regulations	Medium	N/A	Medium	emergency management	Low	General Fund
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Evaluate commercial building code requirements for storm shelters requirements inside commercial and industrial buildings.	2020	Ongoing		Local Plans and Regulations	Medium	N/A	Medium	building code official	Low	General Fund
If necessary, implement storm shelter requirements for commercial and industrial buildings.	2020	Ongoing		Local Plans and Regulations	Medium	N/A	Medium	building code official	Low	General Fund
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Local Plans and Regulations	Medium	N/A	Low cost mechanism to increase public safety.	public works	500	General Fund
Floods										
Enhance public awareness and education efforts related to flooding.										
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing	Public education efforts will continue in plan year 2020; with a reminder to all properties and structures located within the flood plain.	Education and Awareness Programs	Medium	N/A	No/low cost mechanism to encourage flood preparedness.	emergency management	Under $100	General Fund
Ensure all roadways are accessible to emergency service personnel and that at least one route to a destination is accessible without undue delay.										
Assess and if necessary replace Culvert C-12a which crosses 58 Highway near the railroad track wye.	2020	Ongoing		Structure and Infrastructure Projects	High	N/A	Medium	public works	14000	Park/Stormwater Sales Tax/General Fund
Assess and if necessary, replace Culvert C-13a which crosses 58 Highway southeast of the railroad wye.	2020	Ongoing		Structure and Infrastructure Projects	High	N/A	Medium	public works	Low	Park/Stormwater Sales Tax/General Fund
Assess and if necessary, replace Culvert C-17a which crosses 58 Highway east of 7 Highway	2020	Ongoing		Structure and Infrastructure Projects	High	N/A	Medium	public works	83000	Park/Stormwater Sales Tax/General Fund
Consideration of egress in subdivision design, particularly when roadways cross floodplains.	2020	Ongoing		Local Plans and Regulations	High	N/A	Medium	public works, planning	Low	General Fund
Evaluate ordinances regarding roadway drainage ditches and culverts in an effort to allow conveyance of stormwater rather than pooling on roadways (58 Highway).	2020	Ongoing		Local Plans and Regulations	High	N/A	Medium	public works	Low	General Fund
Obtain preliminary cost estimates to either elevate roadways or improve stormwater systems in areas of persistent roadway flooding.	2020	Ongoing		Structure and Infrastructure Projects	High	N/A	Medium	public works	Low	General Fund
Evaluate dams throughout Pleasant Hill to ensure they are structurally sound and do not pose any downstream threats.										

Evaluate City's responsibility and/or regulations which could be put in place for private dam inspections	2020	Ongoing		Local Plans and Regulations	Low	N/A	Medium	public works, floodplain manager	Low	General Fund
Obtain cost estimate for improvements at City Lake Dam	2020	Ongoing		Structure and Infrastructure Projects	High	N/A	Medium	public works	Low	General Fund
Select and implement a solution for dam repair at the City Lake	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	public works	High	Park Fund/General Fund
Examine flood mitigation strategies near downtown Pleasant Hill and along 58 Highway.										
Commission a downtown stormwater study	2020	Ongoing		Local Plans and Regulations	High	N/A	Medium	public works, planning	medium	Park/Stormwater Sales Tax, General Fund
Obtain cost estimate for downtown stormwater study	2020	Ongoing		Local Plans and Regulations	High	N/A	Medium	public works, planning	Low	General Fund
Examine repetitive flood loss properties. Evaluate feasible and practical mitigation options.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Low	N/A	Will eliminate or greatly reduce repetitive loss properties.	public works	$10,000 per year	General Fund
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	The City still has a large number of structures within the floodplain. While flooding at some properties have either been alleviated or the structure has been removed, there is still work to do.	Structure and Infrastructure Projects	Medium	N/A	No/ or low cost to implement and require little staff support.	public works	100	General Fund
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Local Plans and Regulations	Low	N/A	No/ or low cost to implement and require little staff support.	public works	100	General Fund
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing		Local Plans and Regulations	Low	N/A	No/ or low cost to implement and require little staff support.	public works, floodplain manager	100	General Fund
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Medium	N/A	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning, public works	medium	General Fund
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										

In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing	As the City prepares for a comprehensive plan update, this action will be considered again.	Local Plans and Regulations	Medium	N/A	Medium	planning, city administration	Low	General Fund
Provide a flood warning system for residents and motorists to alert of closures and rising water to allow time to alter routes, sandbag properties, or evacuate.										
Continue to work with MoDOT regarding 58 Highway closures and placing the closure on the road conditions map as quickly as possible.	2020	Ongoing		Education and Awareness Programs	Low	N/A	Medium	public works	Low	General Fund
Coordinate with MoDOT regarding 58 Highway closure signage closer to 291 to reduce the number of individuals who drive through flooded roadways.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	public works	Low	General Fund
Explore utilization of Everbridge or other alert notification system for a specialized flash flood prone area.	2020	Ongoing		Education and Awareness Programs	Low	N/A	Medium	emergency management	Medium	General Fund
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Will eliminate or greatly reduce repetitive loss properties.	floodplain manager	Varies	General Fund
**Evaluate the adoption of stream setback ordinances	2020	Ongoing		Local Plans and Regulations	Medium	N/A	Medium	planning, public works	Low	General Fund
Explore ways to mitigate against extreme heat during outdoor activities.										
Coordinate with the Cass County Library for use as a cooling center when needed	2020	Ongoing		Education and Awareness Programs	Low	N/A	Medium	emergency management	100	General Fund
Evaluate cooling centers for use at the Cass County Fair.	2020	Ongoing		Structure and Infrastructure Projects	Low	N/A	Medium	emergency management	100	General Fund
Increase awareness of effects of extreme heat.										
Create a public information campaign regarding the effects of extreme heat on your body and health.	2020	Ongoing		Education and Awareness Programs	Medium	N/A	Medium	emergency management	200	General Fund
Create a public information campaign regarding water conservation methods.	2020	Ongoing		Education and Awareness Programs	Medium	N/A	Medium	emergency management	200	Water/Sewer Fund
Severe Thunderstorms										
Provide back up power to critical infrastructure	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	Low	General Fund
Continue educational campaigns regarding severe thunderstorms, primarily during outdoor activities.										
Incorporate severe weather public information campaigns to all parents of children enrolled in recreation programs	2020	Ongoing		Education and Awareness Programs	Low	N/A	Medium	parks and recreation	200	General Fund/Park Fund
Provide signage at Cass County Fair regarding Everbridge and other means of weather alerts, encouraging patrons to utilize these systems.	2020	Ongoing		Education and Awareness Programs	Medium	N/A	Medium	emergency management	300	Cass County Fair
Ensure warming centers and critical services can continue operations in the event of prolonged power outages.										

Assess availability of fuel resources in the event of power outages.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	Low	General Fund
Coordinate with critical facilities to assess back up generation capabilities including how long generators are operable.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	Low	General Fund
Evaluate number of emergency generators available for warming centers.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	100	General Fund
Evaluate the backup generation capacity at each of the Red Cross emergency shelters listed in Pleasant Hill.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	Low	General Fund
Purchase emergency generators for sewer lift stations.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	public works	600000	Water/Sewer Fund
Purchase generator for emergency warming center (Memorial Building)	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	public works	200000	General Fund
Test the generator for the emergency warming shelter at the Methodist Church.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	emergency management	100	General Fund
Reduce the number of trees or tree limbs likely to cause damage during severe winter weather.										
Create a public education campaign regarding tree health and property evaluations.	2020	Ongoing		Education and Awareness Programs	Medium	N/A	Medium	parks and recreation	Low	General Fund
Have the City Arborist inventory trees near utility poles.	2020	Ongoing		Structure and Infrastructure Projects	Medium	N/A	Medium	parks and recreation	Low	General Fund
Identify nearest emergency shelter for public outdoor facilities.										
Identify sheltors for public outdoor facilities.	2020	Ongoing		Local Plans and Regulations	Medium	N/A	Medium	parks and recreation	Low	General Fund

2025 Raymore Mitigation Strategy

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	updated 2025	Ongoing	This action is continually promoted through various departments.	Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Completed	This is completed.	Local Plans and Regulations	Medium	Completed	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	emergency management	Medium	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	updated 2025	Ongoing	We have finished all identifications necessary and will be working to complete all appropriate signage as soon as possible. Especially for our new buildings.	Structure and Infrastructure Projects	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	updated 2025	Ongoing	We continue to develop individual preparedness materials that include safe rooms. Additionally, I attended the safe room construction class in order to better serve the community in answering questions.	Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Enhance public awareness and education efforts related to flooding.										

Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	We also market the NFIP.	Education and Awareness Programs	Medium	Ongoing (as new homes and businesses continue)	Will reduce recovery costs and ensure compliance with NFIP.	floodplain management	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	updated 2025	Ongoing	We also have city ordinances restricting building in a floodplain.	Structure and Infrastructure Projects	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning, public works	High	Local Budgeted Funds and Staff Time; HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	updated 2025	Ongoing	We have a designated stormwater plan.	Structure and Infrastructure Projects	Medium	Ongoing	Will prevent flooding for moderate costs	planning, public works	Medium	Local Budgeted Funds and Staff Time; BRIC, HMGP
Severe Thunderstorms										
Ensure local alert systems are in place and operational during severe weather.										
Continue to promote the emergency alert notification system within the City of Raymore and the county	updated 2025	Ongoing	We use Everbridge now, not Code Red.	Education and Awareness Programs	Medium	Ongoing	Low cost mechanism for mass alerting of citizens to danger.	emergency management	Low	Local Budgeted Funds and Staff Time
Maintain the city's siren system in good working order and continue to assess the coverage those sirens provide	updated 2025	Ongoing	We continue to contract with Blue Valley Public Safety for this issue.	Structure and Infrastructure Projects	Medium	Ongoing	Will sustain primary warning capability of the city.	emergency management	Low	Local Budgeted Funds and Staff Time
Establish a current database of Red Cross certified shelters that could be used during severe weather and make that list available to the public.										
Identify all establishments that could be used as shelters. If consented to be a shelter, have Red Cross inspect and certify establishment as a shelter	2015	Ongoing	We have one dedicated (and Red Cross inspected) shelter and are currently in the process of getting a second site inspected.	Structure and Infrastructure Projects	Medium	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Work with neighboring communities, MEMC, and MARC on creating an updated shelter database for the entire region	2015	Ongoing	We need to continually get an updated list from MARC of area shelters.	Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Increase the public's awareness of the dangers of severe thunderstorms and the need to shelter immediately.										

Distribute severe storms safety literature at public events and launch announcements through social media and the city website	2015	Ongoing	We offer a robust platform for severe weather information including literature, Facebook, Twitter, city website, and outside online resources.	Education and Awareness Programs	Medium	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Promote storm spotter training for the entire region	2015	Ongoing	We continually promote the annual storm spotting class through the National Weather Service.	Education and Awareness Programs	Low	Ongoing	Free program that benefits public awareness and city alerting procedures.	emergency management	Low	Local Budgeted Funds and Staff Time
Promote the advantages of identifying, creating, or building a safe room to be used during severe weather.										
Continue to register storm shelters as they are installed in homes and businesses throughout the community	2015	Ongoing	We maintain a safe room registration list within our Police Department.	Local Plans and Regulations	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Work with residents and business partners by providing information on safe rooms and shelters when requested	2015	Ongoing	This would be the same as above in the Tornado section.	Education and Awareness Programs	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time

2025 Clay County Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time/BRIC
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Ensure Alert, Warning and Mass Notification systems are in place and operational.										
Conduct monthly test of outdoor siren warning system.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Continue outdoor siren routine maintenance program	2025	New, reviewed in 2025		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	Low	Sheriff Office Budget
Subscibe to a Mass Notification System	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	BRIC, HMGP
Floods										
Discourage new development in floodplains and flood-prone areas.										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time
Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time
Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Develop and share flood hazard maps and evacuation plans with the public.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time

Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Planning & Zoning	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Improve public awareness and preparedness for severe thunderstorm events.										
Develop public campaigns to promote the importance of having emergency kits and backup power supplies.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Encourage businesses to assess vulnerabilities and adopt thunderstorm mitigation measures.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Ensure uninterrupted communication and emergency response capabilities during severe thunderstorms.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Road and Bridge	Low	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Enhance city readiness for severe winter weather, including snow, ice, and extreme cold.										
Develop and distribute winter weather preparedness guides, including tips for home heating, vehicle safety, and preventing frostbite.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Partner with community stakeholders to identify heated public, private, and nonprofit facilities that can be used as "emergency warming shelters" during extreme cold and severe winter weather.										
Establish partnerships with local business to provide warming centers during extremem cold events.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Sustain the operation of municipal services, including snow removal and emergency response, during severe winter weather.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Road and Bridge	Low	Local Budgeted Funds and Staff Time
Conduct regular maintenance and upgrades to critical infrastructure, including roads, to minimize disruptions.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Road and Bridge	Low	Local Budgeted Funds and Staff Time
Coordinate with the school district to ensure continuity of operations during winter storms.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Extreme Temperature										
Protect vulnerable populations from extreme heat impacts.										
Identify and publicize locations for cooling centers, including city facilities and partnering organizations.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Develop heat awareness campaigns, focusing on hydration, recognizing heat-related illnesses, and cooling strategies.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Collaborate with businesses and schools to establish heat mitigation measures, such as shaded areas and hydration stations.	2025	New, reviewed in 2025		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Ensure city services and cooling options remain accessible during prolonged extreme heat events.										

Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Road and Bridge	Low	Local Budgeted Funds and Staff Time
Integrate heat mitigation strategies into city-wide continuity and emergency operations plans.	2025	New, reviewed in 2025		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time

2025 Excelsior Springs Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	planning; public works	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.	2020	Ongoing	Identified for new plan	Education and Awareness Programs	Medium	Ongoing	Medium	planning; public works	High	HMGP, BRIC
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	planning; public works	Low	Local Budgeted Funds and Staff Time
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing	This is an ongoing process.	Local Plans and Regulations	Medium	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time

Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind including Hall of Waters and schools in the city.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Increase public Education/ Awareness and Readiness for Tornadoes and Severe Thunderstorms										
Host a mock drill with all city officials.	2015	Ongoing	Needs to be completed with ever changing city officials.	Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Host a public education event.	2015	Ongoing	Resources for this event is limited, minor ongoing education continues.	Education and Awareness Programs	Medium	2+ years	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Develop plans and adopt policies to address sound stormwater and flooding challenges										
Mitigation Action: Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	no costs identified	City Council	Low	Local Budgeted Funds and Staff Time
Discourage new development in floodplains and flood-prone areas.										
**Continue to implement city regulations as participation in the federal flood insurance program.	2020	Ongoing	Part of city's planning and zoning process.	Local Plans and Regulations	High	Ongoing	part of city operation	floodplain manager	Low	general revenue
Enhance public awareness and education efforts related to flooding.										
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time

**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2010	Completed		Structure and Infrastructure Projects	Medium	Completed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	planning, public works	Low	Local Budgeted Funds and Staff Time
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	planning, public works	Low	Local Budgeted Funds and Staff Time
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works, parks and recreation	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	High	BRIC, HMGP, FMA
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works, planning	Low	Local Budgeted Funds and Staff Time
**Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time

**Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2010	Completed		Education and Awareness Programs	Medium	Completed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
**Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2010	Completed		Education and Awareness Programs	Medium	Completed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Reduce flood risk to city.										
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Completed		Structure and Infrastructure Projects	Medium	Completed	Medium	emergency management	High	BRIC, HMGP, FMA
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works, parks and recreation	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Completed		Structure and Infrastructure Projects	Medium	Completed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Completed		Local Plans and Regulations	Medium	Completed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Dam Failures										
Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.										
Identify area at risk for Crystal Lakes to provide updates as to condition of dam and ensure residents at risk have evacuation access.	2020	Ongoing	New	Education and Awareness Programs	Low	Ongoing	Low cost mechanism to increase public safety.	public works	Low	Local Budgeted Funds and Staff Time
Extreme Temperatures										
Ensure local government and human service agencies ae aware of A/C facilities across area that can be used as shelters in the event of a heat wave.										
Identify cooling centers in the city.	2020	Ongoing	New	Local Plans and Regulations	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time

Severe Winter Weather										
Increase winter weather response readiness										
Identify emergency snow routes.	2020	Ongoing	New	Local Plans and Regulations	Medium	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Ensure local government and human service agencies ae aware of facilities across area with backup power or generators that can be used as shelters in the event of severe winter weather										
Identify potential sites for emergency shelters.	2020	Ongoing	New	Local Plans and Regulations	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time

2025 Gladstone Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2024	Ongoing		Bldg Code Update	Medium	Ongoing	Low/no cost mechanism to increase public safety.	Planning, building codes	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2024	Ongoing		Bldg Code Update	Medium	Ongoing	Low/no cost mechanism to increase public safety.	planning, building codes	Low	Local Budgeted Funds and Staff Time
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2024	Ongoing	Case by Case	Local Plans and Regulations	Medium	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	planning, building codes	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2023	Ongoing	Fire Station 2 completed 2023	Structure and Infrastructure Projects	Medium	Ongoing	City bldgs being retrofit as renovations occur	Planning, building codes	$25,000 per structure	Local Budgeted Funds and Staff Time
Provide more public information on preparing for a disaster.										
Public Education and EOP updates	2024	Ongoing		Education and Awareness Programs	High	Ongoing	Low/no cost mechanism to increase public safety.	Gladstone Emergency Management Agency	Low	Local Budgeted Funds and Staff Time
Floods										
Develop plans and adopt policies to address sound stormwater and flooding challenges										

Mitigation Action: Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	New	Metro KC APWA Section is working with consultants to complete the new standards in 2025; Participating in review of draft standards under development	Local Plans and Regulations	High	12/31/2026	no costs identified	City Council	Low	Local Budgeted Funds and Staff Time; HMGP, BRIC
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2025	New	Identify repetitive flood loss properties and determine buyout opportunities.	Structure and Infrastructure Projects	Medium	Ongoing	no costs identified	City Council	High	HMGP, BRIC
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	No/ or low cost to implement and require little staff support.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2024	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2024	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	High	HMGP, BRIC
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	High	HMGP, BRIC
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time

Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Increase public disaster preparedness.										
Provide Public Education materials and EOP updates	2024	Ongoing		Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time

2025 Kearney Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Completed	The City follows the 2012 IRC and IBC, which has standards for when tempered glass is required during construction.	Structure and Infrastructure Projects	Low	Completed	While may increase building costs, will lead to greater occupant safety	Emergency Mgt.	100000	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Completed	The City encourages the use of safe rooms/storm shelters with educational material available online and city hall.	Education and Awareness Programs	Low	Completed	Low/no cost mechanism to increase public safety.	Emergency Mgt.	5000	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing	The City encourages the use of safe rooms/storm shelters with educational material available online and city hall. New public building construction in the City has only been school district facilities the past 10 years.	Local Plans and Regulations	Low	Ongoing	Medium	code official, planning	Low	Local Budgeted Funds and Staff Time
Improve emergency response to large scale events										
Create a Community Emergency Response Team program	2015	Ongoing		Education and Awareness Programs	Low	2025	Increases community involvement and disaster preparedness at relatively low cost.	Emergency Mgt.	Low	Fire District Budget
Floods										
Discourage new development in floodplains and flood-prone areas.										
**Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2010	Ongoing	The City requires residential construction to be a minimum 3' the base flood elevation.	Local Plans and Regulations	Medium	Ongoing	Medium	planning, public works	Low	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.										

Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	The City's website includes flood insurance information	Education and Awareness Programs	Low	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	3000	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Completed	The City has flood information available at City Hall and city website.	Education and Awareness Programs	Medium	Completed	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing	Police & Fire monitor problem areas and maintain close communication during flooding events	Local Plans and Regulations	Low	Ongoing	Low cost mechanism to increase public safety.	Emergency Mgt.	3000	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing	Police & Fire monitor problem areas and maintain close communication during flooding events	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented jointly.	2010	Ongoing		Education and Awareness Programs	Low	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Medium	planning, public works, parks and recreation	low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing	The City elevated electrical controls at the east side lift station. Sewer plant expansion improvements have been located outside the floodplain.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	high	Local Budgeted Funds and Staff Time
**Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2010	Ongoing	The City elevated electrical controls at the east side lift station. Sewer plant expansion improvements have been located outside the floodplain.	Local Plans and Regulations	Medium	2025	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	100000	water and sewer revenues, grants
Severe Thunderstorms										
Ensure operability of public facilities during severe weather events										

Retrofit existing city faculties with backup power - city hall, water wells	2015	Ongoing	Backup power was installed at the water plant in 2016, and installed at the sewer plant and Jamespoint lift station in 2020. Remaining facilities include the east side lift station, water wells, and city hall.	Structure and Infrastructure Projects	High	2025	Would ensure continuity of government operations and public services.	public works	300000	Local Budgeted Funds and Staff Time

2025 Lawson Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Create a safe storm shelter for people at public campgrounds and for city lake users.										
Identification and Planning for a storm shelter at public campgrounds and city lakes.	2020	Ongoing	Public safety issue has been identified but an affordable solution has yet to be found.	Structure and Infrastructure Projects	High	Ongoing	Medium	planning, public works, parks and recreation	High	HMGP, BRIC
Create a safe storm shelter in the downtown district to house members of the community living in older homes or without basements.										
Identification and Planning for a storm shelter in the downtown area.	2020	Ongoing	Public safety issue has been identified but an affordable solution has yet to be found	Structure and Infrastructure Projects	High	Ongoing	Medium	emergency management, public works	High	HMGP, BRIC
Create municipal storm shelter plan and purchase required supplies to house evacuees locally.										
Identification and Planning to identify storm shelter locations and necessary supplies.	2020	Ongoing	The community safety issue has been identified but an affordable solution has yet to be found.	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management, public works	Low	Local Budgeted Funds and Staff Time
Develop and implement a continuity of service response plan to ensure continued vital functioning of municipal government.										
Identification and Planning for a continuity of operations plan following a tornado.	2020	Ongoing	Operational challenges have been identified and are being examined in follow up meetings.	Local Plans and Regulations	Medium	Ongoing	Medium	city administration, emergency management	Low	Municipal revenues
Floods										
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Medium	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Participate in the National Flood Insurance Program (NFIP) and consider the Community Rating System (CRS).	2025	New		Local Plans and Regulations	Medium	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Execute additional storm water drainage plans as listed in the city's Storm Water Master Plan.										
Execution of Plan	2020	Ongoing	Multiple storm drainage projects have been identified and are in execution as funding is obtained	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	Low	Municipal revenues and local bonds
Execute north fork of Fishing River Flood Plain mitigation project to lessen flood plain impact for the surrounding community.										
Preliminary planning	2020	Ongoing	Discussion with public concerning projectPossible preliminary engineering	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Improve in house ability to maintain and improve existing storm water drainage system by purchasing additional equipment.										

Identification and Planning	2020	Ongoing	The need for additional equipment has been identified to allow for more in house work projects.	Structure and Infrastructure Projects	High	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Preliminary planning	2020	Ongoing	Identify equipment that would aid in maintenance of current stormwater system and procure	Other	High	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Improve natural drainage creek to mitigate storm water flooding between North Pennsylvania and North Raum street.										
Identification and Planning	2020	Ongoing	Storm water flooding issue has been identified but project funding has not been located to move forward with mitigation.	Local Plans and Regulations	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Replace wooden bridge on North Raum Street to allow for a norther evacuation route out of town capable of carrying the weight of fire trucks.										
Engineering work has been completed and an approved plan was selected.Plan is submitted to UP railroad for their review and approval	2020	Ongoing	A wooden bridge (last refurbished in 1940) owned privately by Union Pacific which is no longer rated for fire truck or school bus weights.	Structure and Infrastructure Projects	High	Ongoing	Medium	public works	3200000	20% funding provided by the railroad.
Storm water drainage improvements near 8th Terrace.										
Preliminary planning	2020	Ongoing	Discussion with public concerning project. Possible preliminary engineering	Local Plans and Regulations	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Storm water drainage improvements near Cardinal Circle/Nolker Drive.										
Preliminary planning	2020	Ongoing	Discussions with public on project. Possible preliminary engineering	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Storm water drainage improvements near Milwaukee Street.										
Engineering and construction	2020	Ongoing	Engineering is nearly completed. Project will be going out for bid in Spring 2020Construction to begin Summer 2020	Structure and Infrastructure Projects	High	Ongoing	Medium	public works	400000	HMGP, BRIC
Severe Thunderstorms										
Establish safe storm shelter for use as an evacuation point for the municipal pool complex.										
Identification and Planning	2020	Ongoing	Public safety issue has been identified but an affordable solution has yet to be found.	Structure and Infrastructure Projects	High	Ongoing	Medium	parks and recreation	High	HMGP, BRIC
Severe Winter Weather										
Establish a transportation plan to evacuate at risk individuals and create a municipal warming shelter.										
Identification and Planning	2020	Ongoing	Public safety threat do to long term power outages have been identified. Planning to meet this threat is ongoing but funding has yet to be located.	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management, public works	Low	Local Budgeted Funds and Staff Time
Extreme Temperatures										

Institute a severe heat response by purchasing in home air conditioners and establishing public cooling centers.										
Identification and Planning	2020	Ongoing	The need for in home cooling and local cooling centers has been identified but additional funding has yet to be found.	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management, public works	Low	Local Budgeted Funds and Staff Time

2025 Liberty Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Continue to educate the public about the importance of having a weather radio in their home										
Outreach at local events	2020	Ongoing	Community outreach using CERT volunteers to distribute information to the public at local events.	Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety and avoid loss of life.	emergency management	Low	Local Budgeted Funds and Staff Time
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2020	Ongoing	Ensure building codes pertaining to wind damage mitigation requirements are being followed	Education and Awareness Programs	High	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2020	Ongoing		Education of stakeholders in meetings such as our Safe Schools Task Force.	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	School district
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2020	Ongoing	All new residential and commercial construction has buried electrical service lines.	Plan reviews are completed for all building projects within the city to ensure compliance	High	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing	While a low cost item we lack resources and funding to incorporate into public structures	The city will follow its own buidling and fire codes that require this	Low	Ongoing	Low/no cost mechanism to increase public safety.	planning, building code	Low	Local Budgeted Funds and Staff Time
Improve storm warning capabilities.										
Continue to hold monthly siren tests	2020	Ongoing		Local Plans and Regulations	High	March-Oct	No cost mechanism to ensure sirens operate effectively.	emergency management	Low	Local Budgeted Funds and Staff Time

Continue to upgrade outdoor warning sirens as funding allows	2020	Ongoing	Lack the necessary funding. Will have to seek grant opportunities in order to replace aging outdoor sirens as well as adding sirens to areas that have recently opened for development.	Structure and Infrastructure Projects	Medium	Will have to seek out and apply for grants to complete	Medium	emergency management	$175,000	Local Budgeted Funds and Staff Time
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2020	Ongoing	Lack the resources and funding for development.	Education and Awareness Programs	Low	Ongoing	Distribution of materials is a low/no cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Develop plans and adopt policies to address sound stormwater and flooding challenges										
Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	New	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	Medium	City Council	Low	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.										
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2020	Ongoing	Community outreach using CERT volunteers to distribute information to the public at local events.	Education and Awareness Programs	Low	Ongoing	Low cost mechanism to increase flood preparedness	emergency management	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2020	Ongoing	Community outreach using CERT volunteers to distribute information to the public at local events.	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2020	Ongoing	The city utilizes GIS data from FEMA and the Army Corp of Engineers.	Have used the data to identify potential risks to the community	High	Ongoing	low	planning, public works	Low	Local Budgeted Funds and Staff Time
**Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2020	Ongoing		Local Plans and Regulations	Low	Ongoing, updating as needed	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning, public works	Low	Local Budgeted Funds and Staff Time

**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing		Local Plans and Regulations	Low	Ongoing, updating as needed	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning, public works	Low	Local Budgeted Funds and Staff Time
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2020	Ongoing		Local Plans and Regulations	Low	Ongoing	Free technical assistance to improve floodplain management	planning, public works	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Medium	planning, parks and recreation, public works	High	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2020	Ongoing	The city follows regional stormwater guidelines issued by the MARC	Structure and Infrastructure Projects	High	Developers are required to follow regional stormwater management guidelines	Medium	planning, parks and recreation, public works	High	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implementted	2020	Ongoing	The city continues to participate in regional stormwater management practices	Local Plans and Regulations	Low	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	public works, emergency management	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Low	Ongoing, updating as needed	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Description Continue to monitor weather situation and provide warnings through Public relations department										

Provide warning through public relations	2020	Ongoing	PR department is active in providing mass text and social media alerts.	Education and Awareness Programs	High	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time

2025 North Kansas City Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high winds	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	The cost of installing a tornado shelter in the fire station will be $5600.00 to install the shelter. Benefit is to the Fire and Police personnel whose duty assignment places them in this station and patrol area	emergency management, public works	5600	Local Budgeted Funds and Staff Time
Increase public awareness and understanding the benefits of "safe rooms."										
Develop and distribute informational materials on safe rooms	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	The cost of installing a tornado shelter in the fire station will be $5600.00 . The benefit is that it provides a shelter from tornados independent of the existing structure and will serve as an example to be used when doing public education on tornado shelters	Emergency Mgt.	5600	Local Budgeted Funds and Staff Time
Provide updated information to the citizens in the areas where a tornado would create the most issues.	2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety.	Emergency Mgt.	Minimal	Local Budgeted Funds and Staff Time
Increase public awareness and understanding of severe weather events and safe practices.										
The North Kansas City Fire Department has become an official Weather Ready Nation Ambassador and is working to provide consistent information about severe weather through social media	2020	Ongoing		Education and Awareness Programs	High	3- months	little to no cost	fire department	minimal	Local Budgeted Funds and Staff Time
Floods										
Conduct special education events such as flood mitigation and preparedness.										

Conduct special public education events	2015	Deferred	Waiting for approval of a new flood evacuation plan from our engineer.	Education and Awareness Programs	High	12 months	Since the training will be conducted by existing personnel and the media materials will come from FEMA there is no monetary outlay, the benefits will be to the at risk population and to the businesses located in flood prone areas.	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Develop plans and adopt policies to address sound stormwater and flooding challenges										
Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	New: Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	Medium	City Council	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Complete inspection of storm sewers in the Paseo Industrial District (PID)	2020	Ongoing	We had severe damage from 2019 floods this will identify future problem areas	Prevention	High	1-year	Cost of inspection prior to damage is much less than repairs	public works	$50,000	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Medium	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing	We currently participate in NFIP	Local Plans and Regulations	High	Ongoing	There is no cost to become part of the NFIP or CRS systems. Benefits are to the Residents and Businesses who take advantage of the programs	floodplain manager	Low	Local Budgeted Funds and Staff Time

2025 Pleasant Valley Mitigation Strategy (New Participant)										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes and Severe Thunderstorms										
Ensure the public is alerted when the city is at risk from severe thunderstorms or tornadoes										
Continue to fund the resident alert system and encourage participation	2025	new		Education and Awareness Programs	High	Ongoing		emergency management, public works	medium	Local Budgeted Funds and Staff Time
Increase public awareness and understanding of severe weather events and safe practices.										
Provide public education material on tornado safety and the use of the Civic Center as a community storm shelter	2025	new		Education and Awareness Programs	High	ongoing	low cost	fire department	low	Local Budgeted Funds and Staff Time
Floods										
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Participate in the National Flood Insurance Program (NFIP)	2025	New	We currently participate in NFIP	Local Plans and Regulations	High	Ongoing	There is no cost to become part of the	floodplain manager	Low	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Ensure the public is alerted when the city is at risk from severe winter weather.										
Continue to fund the resident alert system and encourage participation	2025	New		Education and Awareness Programs	High	Ongoing	low cost	emergency management, public works	Low	Local Budgeted Funds and Staff Time
Severe Temperatures and Drought										
Ensure that the public knows to take actions to prevent health problems due to severe heat and how to conserve water during drought conditions										
Provide public education material on coping with severe heat events	2025	New		Education and Awareness Programs	High	Ongoing	low cost	emergency management, fire department	Low	Local Budgeted Funds and Staff Time

2025 Smithville Mitigation Strategy

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Upgrade outdoor tornado sirens in the next 2-3 years										
Review current outdoor tornado sirens and prepare grant application to install new sirens to address gaps in coverage	2025	new		Structure and Infrastructure Projects	Medium	New	Medium	Fire department	High	FEMA grant
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Adopted		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Adopted no retrofit		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	High	Local Budgeted Funds and Staff Time; HMGP, BRIC
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	next 5 yrs.		Structure and Infrastructure Projects	Medium	Next 5 Years	No cost mechanism to increase public safety.	public works	Low	Local
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	next 5 yrs.		Structure and Infrastructure Projects	Medium	Next 5 Years		public works	High	Local
Increase emergency shelter capacity.										
Develop relationships with area churches, library and senior center for use of facilities if needed as a shelter.	2015	will determine in next 5 yrs.		Education and Awareness Programs	Medium	Ongoing	No cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Hold discussions with school district to obtain permission to use Performing Arts Center as a tornado shelter	2015	undetermined		Education and Awareness Programs	Medium	Ongoing	No cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Increase public safety alert and warning mechanisms.										
Continue social media use. Provide officers training on how to use social media to send info on weather incidents	2015	Ongoing		Education and Awareness Programs	High	Ongoing	No cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Provide officers on-going training in use of the tornado siren system.	2015	Ongoing	all new officers receive training	Education and Awareness Programs	High	Ongoing	No cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Use social media to provide community notice of upcoming weather related training and free weather radios.	2015	Ongoing		Education and Awareness Programs	Medium	Ongoing	No cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										

**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2020	Ongoing	More information is needed to initiate this effort	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	Low	HMGP, BRIC, FMA
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Unspecified	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing	We currently participate in NFIP	Local Plans and Regulations	High	Ongoing	There is no cost to become part of the NFIP. Benefits are to the Residents and Businesses who take advantage of the programs	floodplain manager	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
Continue implementing flooding mitigation initiatives through the City's CIP	2025	Ongoing		CIP	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
install lightning strike sirens in public parks to enhance safety and provide early warnings during severe weather conditions	2025	new		Structural and Infrastructure Projects	Medium	new	Medium	public works	Medium	FEMA HMGP

2025 Jackson County Mitigation Strategy													
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Applies to Community Assets (New/Existing)**	**Existing Local Planning Mechanism through which the action was/will be implemented**	**Primary Agency Responsible for Implementation/ Administration**	**Date for Completion**	**Cost / Benefit Review**	**Target Capacity**	**Estimated Cost ($)**	**Funding Source**
Tornadoes													
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.													
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing	The County has designated safety locations in governmental facilities for staff and visitors to shelter in during severe weather events. As a "Storm Ready" Community each facility has an "All-Hazard" weather radio and a method of being contacted by the EOC	Local Plans and Regulations	High	Existing	Eastern Jackson County has designated shelter /safety locations as part of the Office of Emergency Preparedness function within County ordnances and codes	Department of Emergency Preparedness/ County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County Department general funds and grants
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing	Continued work with local jurisdictions within the County to implement such regulations.	Local Plans and Regulations	Medium	New and Existing		public works, code officials	Ongoing	Medium		Low	County Department general funds and grants
Retrofit or add shelters to existing public facilities or incorporate safe rooms into new public buildings to allow for adequate protection from tornadoes and high wind.	2020	Ongoing	The county continues to try and develop storm shelters in existing public facilities as funding and opportunities become available. As new construction of public facilities is planned, consideration will be given to the addition of safe rooms.	Structure and Infrastructure Projects	High	Existing	Eastern Jackson County has designated shelter /safety locations as part of the Office of Emergency Preparedness function within County ordnances and codes	Department of Emergency Preparedness/ County	Ongoing	High cost to retrofit existing buildings but can also prevent large number of injuries and fatalities. Some cost could be subsidized by tax incentives and grants		High	HMGP, BRIC
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.													
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2020	Ongoing	The County continues to work with contractors in regards to utilizing construction techniques and materials that may minimize tornado/ high wind damage	Education and Awareness Programs	High	New and Existing	Office of Emergency Preparedness function within County ordnances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.													
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2020	Ongoing	The Jackson County Department of Emergency preparedness continues to promote the benefits of safe rooms through citizens training in Severe Weather classes at no cost. Also addressed schools districts in Eastern Jackson County and many corporate facilities	Education and Awareness Programs	High	New and Existing	Office of Emergency Preparedness function within County ordnances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
Increase capabilities to provide mass notifications to the public													

Adding "Outdoor Warning Sirens" to increase warning notification coverage for County lake properties / Jacomo/Blue Springs/Longview and assess and install additional sirens as appropriate to warn the public	2020	ongoing		Structure and Infrastructure Projects	Medium	New	Office of Emergency Preparedness function within approved County ordnances and codes	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Would give residents enhanced warnings and improved response coordination but would have a high implementation and maintenance cost.		Medium	County General Funds
Increase public awareness and understanding the benefits of "safe rooms."													
Develop, distribute informational materials on safe rooms.	2020	Ongoing	Implemented through the Counties preparedness educational and outreach program with emphasis on existing shelter facilities located throughout the county	education and Awareness Programs	High	Existing	Office of Emergency Preparedness function within County ordnances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
Flooding													
Discourage new development in floodplains and flood-prone areas and improve safety for the traveling public from flash floods across roadways.													
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2020	Ongoing	Flood Plan management continues to enforce and recommend changes to meet FEMA requirements and regulations	Local Plans and Regulations	High	Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plain Management/Public Works	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
**As low water crossings are identified and evaluated, seek funding to redesign and construction roadway segments to reduce further risks to travelers.	2020	ongoing		Structure and Infrastructure Projects				public works	Ongoing	Medium		High	HMGP, BRIC
**Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.	2020	Ongoing	County's Flood Plan manager continues to enforce and recommend changes to meet FEMA requirements and regulations	Local Plans and Regulations	High	Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plain Management/Public Works	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
**Identify low water crossings along roadways in unincorporated Jackson County	2020	Ongoing	In progress; as identified putting up signage	Local Plans and Regulations	Medium			Flood Plain Management/ Public Works/Emergency Preparedness	Ongoing	Medium		High	HMGP, BRIC
Enhance public awareness and education efforts related to flooding.													
Encourage home owners and businesses to purchase flood insurance.	2020	Ongoing	The County Office of Emergency Preparedness has several outreach programs to Encourage home owners and businesses to purchase flood insurance.	Education and Awareness Programs	High	New and Existing	Flood Plain Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plain Management/Public Works	Ongoing	No/low cost mechanism to encourage flood preparedness.		Low	County's general funds and EMPG program grant monies

Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2020	Ongoing	The County's Office of Emergency Preparedness and Public Works Departments have on-going program to educate the public about flooding and its associated hazards. This program includes standardized educational materials coordinated with local and regional partners. This initiative includes brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross, NFIP and other organizations.	Education and Awareness Programs	High	New and Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	No/low cost mechanism to encourage flood preparedness.		Low	County's general funds and EMPG program grant monies
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2020	Ongoing	The County's Office of Emergency preparedness and Public works Departments have on-going program to educate the public about flooding and its associated hazards. This program includes standardized educational materials coordinated with local and regional partners. County department also participate in local, regional, State and national public educational events such as Safety City and Echo- Fest put on by local jurisdictions throughout the county each year.	Local Plans and Regulations	High	New and Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	No/low cost mechanism to encourage flood preparedness.		Low	County's general funds and EMPG program grant monies
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.													
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Ongoing	Repetitive Loss properties in the unincorporated portions of the County in Flood Plain Hazard areas are reviewed for buyout potential.	Structure and Infrastructure Projects	High	Existing	Public Works and Emergency Preparedness function within approved County ordnances and codes	Public Works / emergency Preparedness	Ongoing	High Initial cost of purchasing property but also high returns by preventing future flooding of properties that have had history of major flood damages		High	Hazard Mitigation Grants
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Ongoing	The County continually tries to identify potential funding sources to mitigate flood losses to repetitive properties. This sources include private, local, state and federal grants.	Local Plans and Regulations	High	Existing	Public Works and Emergency Preparedness function within approved County ordnances and codes	Jackson County Public Works	ongoing	Low/no cost mechanism to increase public safety and help prevent the high cost of flood damages		Low	Mitigation grants

**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing	County has identified repetitive loss areas and residences and continues to work with them in ways to prevent or reduce future flood losses	Local Plans and Regulations	High	Existing	Public Works and Emergency Preparedness function within approved County ordnances and codes	Flood Plain Management/ Public Works/Emergency Preparedness	Ongoing	Preventing future flooding of properties that have had history of flood damage		Low	County General funds and EMPG funding/
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2020	Ongoing	County continues to work with local jurisdictions, Public Works and Parks and Rec to assess needs and mitigation options	Education and Awareness Programs	Medium	New	Public Works and Emergency Preparedness function within approved County ordnances and codes	Public Works and Emergency Preparedness	Ongoing	Low/no cost mechanism to increase public safety and help prevent the high cost of flood damages		Low	County General Funds along with grant funding such as HMPG, PDM, FMA and RFC
Improve emergency response during flooding events.													
Develop rapid response teams	2020	Deferred; depend upon region's technical rescue teams for response	Development of specialized teams to help clean-up flooded homes and businesses to reduce flood damages throughout the County.	Planning	Medium	new	Office of Emergency Preparedness and Public Works Department functions within City ordnances and codes	Office of Emergency Preparedness	Ongoing	No/low cost mechanism to reduce flood damages		Low	County General Funds and EMPG grants
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community based on building codes for various jurisdictions and have addressed regularly.													
a. Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2020	Ongoing	The County continues to reduce flooding hazards in the unincorporated portions of the county through ongoing efforts to channel and catch storm water as funding allows	Structure and Infrastructure Projects	High	Existing	Public Works and Emergency Preparedness function within approved County ordnances and codes	Parks & Rec/Public works/Corps of Engineers	Ongoing	Will prevent flooding for moderate costs		Medium	Mitigation grant funding
b. In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2020	Ongoing	The County will continue to look for funding opportunities to remove targeted repetitive loss properties for use a open space land.	Local Plans and Regulations	High	New and Existing	Public Works and Emergency Preparedness function within approved County ordnances and codes	Department of Emergency Preparedness/County and Public Works Department	Open	High Initial cost of purchasing property but also high returns by preventing future flooding of properties that have had history of major flood damages		High	Local Jurisdictional funding sources and government incentives
c. Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	Ongoing	The County consistently continue to apply for State and Federal grants to support and enhance flood mitigation and prevention programs. Recently walking and bicycle trails have been developed in flood prone area. The county encourages local jurisdictions within the county to do the same. This includes identifying funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	Local Plans and Regulations	High	Existing	Local Public Works and Water Pollution Control districts	Public Works	Ongoing	Medium initial cost to preventing future flooding of properties that have had history of flood damage		Medium	County general funds

d. Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing	The county continues to work with DNR and Conservation groups to implement "Green Plans" and other alternative uses of flood prone areas.	Structure and Infrastructure Projects	High	Existing	Public Works, Parks & Rec and Emergency Preparedness Department functions within approved County ordnances and codes	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Medium initial cost to preventing future flooding of properties that have had history of flood damage		Medium	County general funds and grants resources
e. Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2020	Ongoing	The County's Public Works and Emergency Preparedness Departments works with property owners and other stakeholders to develop and implement flood mitigation strategies which promotes protection of fish and wildlife habits	Education and Awareness Programs	High	Existing	Public Works and Emergency Preparedness Department functions within approved County ordnances and codes	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Medium initial cost to preventing future flooding of properties that have had history of flood damage		Medium	County general funds and grant applications
f. Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented jointly.	2020	Ongoing	The County has ongoing programs to educate the public about flooding and its associated hazards. These programs include standardized educational materials coordinated with local and regional partners. County Department also participate in local, regional, State and national public educational events put on by the local jurisdictions throughout the County each year.	Local Plans and Regulations	High	New & Existing	Numerous County Department functions within approved County ordnances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County general funds
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.													
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing	The County continues to maintain up-to-date flood maps and tracks any LOMR etc.	Local Plans and Regulations	High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordnances and codes	Public Works Department and Office of Emergency Preparedness	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.		Low	City General Funds
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing	The County has adopted the NFIP regulations and continues to participate in the program completing mandatory maintenance as required by program regulations.	Local Plans and Regulations	High	New and Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	Will ensure flood insurance is available for homeowners and businesses to control flooding costs.		Low	City General Funds
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.													
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2020	Ongoing	The County constantly tries to identify potential funding sources to mitigate flood losses to repetitive properties by encouraging owners and businesses to elevate their structures in flood prone areas	Structure and Infrastructure Projects	High	Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage		High	Mitigation grant funding

Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2020	Ongoing	The County works with property owners and other stakeholders to develop and implement flood mitigation strategies which promotes protection of these items	Structure and Infrastructure Projects	High	Existing	Emergency Preparedness, Flood Plan management and Public Works implementing FEMA codes and requirements for flood planes	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Low/no cost mechanism to increase public safety.		Low	County general funds and EMPG
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2020	Ongoing	The County encourages utilities to flood proof infrastructure in unincorporated areas and Local Public Works departments are encouraged to mitigating flood prone streams and corresponding facilities at the local level	Structure and Infrastructure Projects	High	Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Department of Emergency Preparedness/County and Public Works Department	Open	While initial cost is high, will reduce recovery and replacement costs from flooding events		High	Private funding
Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2020	Ongoing	All County departments work to reduce flood damages to infrastructure when designing new projects and mitigate current facilities as funding is available.	Structure and Infrastructure Projects	High	Existing	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Department of Emergency Preparedness/County and Public Works Department	On going	While may increase building and development costs, will reduce significant flood impacts		Medium	NFIP CRS program and grant funding
Severe Winter Weather													
Enhance public awareness of severe winter weather mitigation and preparedness activities.													
Collect and disseminate public education materials that address winter weather safety, preparedness and mitigation activities.	2020	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather.	education and Awareness Programs	High	Existing	Emergency Preparedness working with relief agencies and United Way and 211	Emergency Preparedness	Ongoing	No/low cost mechanism to increase public safety.		Low	City general funds
Develop and conduct a public education and awareness campaign on properly winterizing homes.	2020	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather. Also as new homeowners are registered they receive preparedness materials.	education and Awareness Programs	High	Existing	Emergency Preparedness working with relief agencies and United Way and 211	Emergency Preparedness	Ongoing	No/low cost mechanism to increase public safety.		Low	County general funds and EMPG

Partner with emergency services, public health and community groups to conduct special public education events, such as a Severe Winter Weather Awareness Day.	2020	Ongoing	The County's Office of Emergency Preparedness has on-going programs to educate the public about "all Hazards" safety including severe winter weather. These programs include standardized educational materials coordinated with local and regional partners. These partners include County Departments, local faith based organizations and many other public and private groups. The Office of Emergency Preparedness also participates in local and regional public educational events such as the Safety City Preparedness show.	education and Awareness Programs	High	Existing	Emergency Preparedness and Public Works planning and in place generators for emergency status	Public Works and Emergency Preparedness	Ongoing	No/low cost mechanism to increase public safety.		Low	County general funds
Provide vulnerable populations with winter weather safety, preparedness and mitigation information.	2020	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather.	Education and Awareness Programs	High	Existing	Emergency Preparedness working with relief agencies, United Way, 211, MEMC to provide assistance	Emergency Preparedness	Ongoing	No/low cost mechanism to increase public safety.		Low	County general funds and EMPG monies
Ensure local governments and human services agencies are aware of facilities across the Kansas City area with generators or emergency power that can be used as shelters in the event of severe winter weather.													
Retrofit otherwise suitable existing facilities with generators for emergency power.	2020	Ongoing	The County has numerous shelters that have back-up power, but the county continues to work with existing and future shelter locations to find ways to retrofit them with emergency power.	Structure and Infrastructure Projects	High	Existing	Office of Emergency Preparedness functions within City ordnances and codes	Office of Emergency Preparedness	Ongoing	Fairly high cost installation price but will ensure continuity of shelter operations.		Medium	HMGP, BRIC
Consider the adoption of policies requiring generators or other emergency power systems in the construction of new public facilities and critical health care facilities like dialysis centers.	2020	Ongoing	The County currently does not have any existing regulations, but continues to try and implement these policies	Local Plans and Regulations	High	Existing	Emergency Preparedness and Public Works planning and in place generators for emergency status	Public Works and Emergency Preparedness	Ongoing	Fairly high cost program to implement but would help ensure continuity of government operations.		High	County general funds
Increase planning and severe weather coordination between regional partners													
Increase CORE4 participation and coordination efforts	2020	Ongoing	Increase the County's support and coordination efforts with the CORE4 group regarding coordination of severe winter weather warnings, regional decisions and public safety decisions.	Local Plans and Regulations	Medium	New and Existing	Emergency Preparedness and Public Works planning and in place generators for emergency status	Public Works and Emergency Preparedness	Ongoing	No/low cost mechanism to increase public safety.		Low	County general funds
Since traffic accidents account for 70% of injuries related to ice and snow, develop and implement programs to improve road conditions and protect motorists during severe winter weather.													
Budget for the stockpiling of sand, salt and other materials necessary to reduce or eliminate ice on roadways and improve road conditions.	2020	Ongoing	This expense is outlined in the Public Works budget on a yearly basis and funding amount is reviewed every year.	Local Plans and Regulations	Low	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Will ensure continued open roadways.		Medium	General Fund

In an effort to reduce the number of people on the roadways during periods of severe winter weather, develop and implement “snow day” plans and policies for non-essential personnel and encourage private sector and non-profit employers in the community to stay off the roads.	2020	Ongoing	Along with NWS, the largest jurisdictions (CORE4) have developed an arrangement to coordinate announcements of such "snow days" for governmental employees and continues to work on educating non-governmental organizations on the hazards of employees on roadways during severe winter weather.	Local Plans and Regulations	Low	New	Public works and Law Enforcement function within Code of Ordinance	Public Works	Ongoing	Short-term potential lost productivity will be offset by savings from potential employee injury and also reduce traffic and delays that would otherwise occur.		Low	General Fund
Partner with area local governments to establish a mutual aid system for sand, salt and other materials and their delivery resources (i.e., trucks, crews, etc.).	2020	Ongoing	The County works with MoDOT and other jurisdictions	Local Plans and Regulations	Medium	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Low cost mechanism to cost share and increase availability of sand stockpiles.		Low	General Fund
Drought													
Ensure plans and procedures addressing local drought response, drought mitigation and long-term water planning are developed.													
Develop local procedures implementing the provisions of the Missouri Drought Plan.	2020	Ongoing	The County is constantly utilizing local, state and federal programs and guidance regarding long term planning for severe drought.	Planning	Medium	New	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to support drought response.		Low	County General Funds
Working with MARC, develop drought plans and water conservation programs.	2020	Ongoing	The County is utilizing local programs and guidance and coordinates with MARC regarding water drought and conservation programs in County plans	Planning	Medium		Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to support drought response.		Low	City General Funds
Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.													
Develop and conduct public education and awareness programs on drought mitigation, drought response and water conservation.	2020	Ongoing	County is working with MDNR and local jurisdictions to conduct local public educational programs. This includes supplying literature and conducting presentations at local schools and civic events throughout the County.	Education and Awareness Programs	Medium	New	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to support drought response.		Low	County General Funds
Extreme Temperatures													
Enhance public awareness of the hazards associated with heat waves, precautionary measures and area heat wave mitigation and preparedness activities.													
Collect and disseminate public education materials that address heat wave safety, preparedness and mitigation activities.	2020	Ongoing	The County’s Office of Emergency Preparedness has an on-going program to educate the public about “All hazards” preparedness and safety. This program includes standardized educational materials that address the hazards heat waves can cause.	Education and Awareness Programs	High	Existing	Emergency Preparedness working with local heath departments and NOAA	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG

Provide vulnerable populations with public education materials that address heat wave safety, preparedness and mitigation activities.	2020	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards heat waves can cause.	Education and Awareness Programs	High	Existing	Emergency Preparedness working with local heath departments and NOAA	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG
Work with the media to publish special newspaper sections or conduct periodic broadcasts with emergency information on extreme heat.	2020	Ongoing	The county participates with the regional Integrated Warning Team. This group is task to bring all organizations with responsibilities regarding warning the public about severe weather events together to develop more resilient and effective warnings.	Education and Awareness Programs	High	Existing	Emergency Preparedness working with local heath departments and NOAA	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG
Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.													
Identify at-risk, low income and elderly residents and develop a database and map (or GIS layers) of their places of residence.	2020	Ongoing	The office of Emergency Preparedness is currently exploring ways to get at-risk populations into a GIS database.	Planning	High	Existing	Emergency Preparedness working with local health departments to link with Safe Shelter and cooling centers locations	Emergency Preparedness/local health departments	Ongoing	Medium cost method to identify at-risk populations to prevent injury of death		Medium	County general funds
Partner with community service organizations and area businesses to provide air conditioners and/or fans to at-risk groups, low income residents and the elderly.	2020	Ongoing	The County's Office of Emergency Preparedness has numerous government facilities that are air conditioned and available to residents during times of severe heat conditions. The County also coordinates with the United Ways regional 211 information system to help residents identify local "Cooling Centers"	Planning	High	Existing	Emergency preparedness working with local relief agencies and business contacts including Untied Way	Emergency Preparedness	Ongoing	Low cost mechanism to support resiliency for vulnerable populations during heat waves.		Low	County General Fund
Ensure local governments and human services agencies are aware of air conditioned facilities across the Kansas City metropolitan area that can be used as shelters in the event of a heat wave.													
Partner with MARC, local public health agencies, emergency management agencies, the American Red Cross, Salvation Army and other stakeholders to inventory public, private and non-profit facilities that are air conditioned and can be used as "heat emergency shelters" in the event of a heat wave.	2020	Ongoing	The County works with several local and regional stakeholders to ensure the County and local jurisdictions within the county have numerous "Cooling Centers" open to the public during times of sever heat waves.	Planning	High	Existing	Office of Emergency Preparedness and County Health Department functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to identify mitigation strategies for populations vulnerable to heat waves.		Low	County General Funds

Retrofit otherwise suitable existing facilities with air conditioning systems and designate them as shelters for use during heat waves.	2020	Ongoing	Currently the county has numerous shelter sites but, efforts to continue increasing shelter facilities Implemented through the Counties educational preparedness programs and Faith Based shelter initiative are ongoing. Many of these sites have air-conditioning but efforts continue to try and retrofit those shelters that are not climate controlled.	Structure and Infrastructure Projects	High	Existing	Emergency Preparedness utilizes the Safe Shelter Partnership for cooling centers in addition to the Salvation Army and United Way	Office of Emergency Preparedness	Ongoing	Medium cost mechanism to assure populations vulnerable to heat waves are protected.		Medium	County general funds
Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.													
Develop local heat emergency plans or heat wave annexes to local emergency operations plans.	2020	Ongoing	All weather procedures and plans are continually updated and changed as needed.	Planning	High	Existing	Emergency Preparedness working with local health departments to link with Safe Shelter and cooling centers locations	Emergency Preparedness/local health departments	Ongoing	Low cost mechanism to increase public safety.		Low	EMPG and County General Fund
Partner with public safety agencies, local public health agencies and community groups to develop a program to regularly check on elderly, low income and at-risk people in the community during heat waves.	2020	Ongoing	The County has a severe heat plan that coordinates with public and private agencies to check on at-risk populations in the unincorporated areas of the county. This is an on-going program continually identifying additional partners such as CERT, VIPS and faith based organizations.	Planning	High	Existing	The county links with the severe weather plan that coordinates with the local health departments	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	EMPG and County General Fund
Work with community groups to sponsor a program to encourage people to think of those who require special assistance (this effort can be incorporated into Neighborhood Watch, CERT or similar programs).	2020	Ongoing	The County has a severe heat plan that coordinates with public and private agencies to check on at-risk populations in the unincorporated areas of the county. This is an on-going program continually identifying additional partners such as CERT, VIPS and faith based organizations.	Planning	High	Existing	Emergency Preparedness working with Safe Shelter Partnerships FBIO	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	EMPG and County General Fund
Dam Failures													
Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.													
Collect and disseminate public education materials that address dam safety, preparedness and mitigation activities.	2010	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures.	Education and Awareness Programs	High	Existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Conduct a public education campaign to inform dam owners and citizens living near the inundation pathways of dams about the need to properly maintain and upgrade these structures, particularly those that are more than 50 years old.	2010	Ongoing		Education and Awareness Programs	Medium			emergency preparedness office	Ongoing	Medium		Low	County general funds

Provide property owners in or near the inundation pathways of dams with information on dam safety, preparedness and mitigation activities.	2010	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures.	Education and Awareness Programs	High	Existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Work with MDNR and USACE to conduct a public education campaign to inform citizens living near the inundation pathways of dams of the need to be familiar with the emergency action plans for these dams.	2010	Ongoing	The County's Office of Emergency Preparedness has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures.	Education and Awareness Programs	High	Existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Improve warning and evacuation systems and procedures in the event of dam failure.													
Adopt policies, codes or ordinances discouraging development in the vicinity of dam inundation zones.	2010	Ongoing	The County continues to work with local jurisdictions to discouraging development in the vicinity of dam inundation zones.	Local Plans and Regulations	Medium	Existing	Parks & Rec/Public Works/Corps of Engineers working with MDNR to maintain safety building codes to dam inundation zones	Parks & Rec/ Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Reduce the potential for dam failures by enhancing inspection efforts.													
Adopt codes or ordinances requiring permits, engineering studies and safety certifications prior to the construction of new dams.	2020	Ongoing		Local Plans and Regulations	Medium			public works	Ongoing	Medium		Low	County general funds
Adopt local ordinances and/or state laws requiring all dam owners do develop emergency action plans for their dams and provide local public safety agencies with copies of these plans.	2020	Ongoing		Local Plans and Regulations	Medium			public works	Ongoing	Medium		Low	County general funds
For dams not regulated by the state, encourage dam owners to inspect their dams at least annually and submit the results of these inspections to MDNR.	2020	Ongoing		Local Plans and Regulations	Medium			public works	Ongoing	Medium		Low	County general funds
c. Encourage the state to provide MDNR's Water Resources Program with funding necessary to regularly inspect all significant and high hazard dams in the state.	2020	Ongoing		Local Plans and Regulations	Medium			county legislature	Ongoing	Medium		Low	County general funds
Severe Thunderstorms													
Increase severe weather warning capabilities.													
Increase volunteer local weather spotter capability	2015	Ongoing	Development of a countywide home spotter network increasing weather spotters by a minimum of 50 volunteers	Local Plans and Regulations	Medium	new	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Increase weather radio distribution	2015	Completed - Project Community Alert	Increase the use of weather radios by general public and businesses throughout the county	Education and Awareness Programs	Medium	existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Medium	HMGP, BRIC

Increase weather training effectiveness	2015	Ongoing	Develop advanced spotter training classes increasing the level of training weather spotters receive	Local Plans and Regulations	Medium	existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County General Funds
Levee Failures													
Improve levee warning systems.													
Increase accuracy and timely data release from COE regarding water levels on levees throughout the County	2015	Ongoing	Develop methods to accurately know height and length of time water sits on levees	Structure and Infrastructure Projects	Medium	existing	Office of Emergency Preparedness, within City ordinances and codes	County's Office of Emergency Preparedness	Ongoing	Relatively low cost mechanism to increase public safety warnings regarding levee failures.		Low	County General Funds

2025 Blue Springs Mitigation Strategy													
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Applies to Community Assets (New/Existing)**	**Existing Local Planning Mechanism through which the action was/will be implemented**	**Primary Agency Responsible for Implementation/ Administration**	**Date for Completion**	**Cost / Benefit Review**	**Target Capacity**	**Estimated Cost ($)**	**Funding Source**
Tornadoes													
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.													
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2025	Completed	Adopted updated building codes	Local Plans and Regulations	Medium	New and Existing		Planning and Codes Departments	Ongoing	Medium		Low	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.													
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2020	Complete		Local Plans and Regulations	Medium	New and Existing		Community Development	pre 1990	Medium		Low	Local Budgeted Funds and Staff Time
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2020	Ongoing		Structure and Infrastructure Projects	Low	Existing	Due to the prevalence of ice storms in the area KCP&L and its acquired company Aquila, have been working to find areas that are in peril from trees and other natural factors.	Kansas City Power & Light	Ongoing	Medium		High	HMGP, BRIC
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing		Local Plans and Regulations	Low	Existing	On a project by project basis the option is strongly considered to put utility lines underground. Some corridors are too expensive to address without a redevelopment project.	City / Utility/ developer	Ongoing	Medium	Planning	Low	HMGP, BRIC, Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.													
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Local Plans and Regulations	Medium	New	Plan reviews and code requirements, if adopted.	Community Development staff	October 1, 2014	Medium		$7,500	City's General Fund
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Medium	New	This component will be addressed with the update of the development code. Further stakeholder input required.	Planning and Codes Departments	Unknown at this time	Medium		Low	City's General Fund
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Structure and Infrastructure Projects	Medium	New	The new building designs will include rooms that provide safe refuge from tornados and storms.	Planning and Codes Departments	Ongoing	Medium		High	HMGP, BRIC
To use the latest guidance issued in upcoming International Building Code IBC versions.													
Update Building regulations as the IBC changes	2020	Completed		Local Plans and Regulations	High	Overall	IBC Code adoption	Planning and Development Department	Ongoing	Include in operational costs overall	8000	10000	General Fund - Building Fees
Floods													
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.													

Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2020	Ongoing		Structure and Infrastructure Projects	Low		The Public Works Department reviews each water call to determine the source of the flow. Mitigation strategies are formulated on a case by case basis.	Blue Springs Public Works	Ongoing	Medium		Depends on the situation.	City's General Fund
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Ongoing		Local Plans and Regulations	Low	Existing	Public Works grant searches.	Blue Springs Public Works	Ongoing	Medium		High	HMGP, BRIC
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing		Structure and Infrastructure Projects	Medium	Existing	The Department consistently looks for ways to partner with residents and property owners to alleviate overland flooding issues.	Blue Springs Public Works	Ongoing	Medium		The City has very few homes that experience overland flow issues. Most are simply yard	City's General fund and CIP Budget
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.													
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2020	Ongoing		Structure and Infrastructure Projects	High	Existing	Through the plan review process and code requirements detention is required. A comprehensive plan update that was completed in September 2009 heightened awareness of natural detention options and encourages the implementation of such practices.	Public Works and Community Development departments	Ongoing	Medium		High	Developer / Owners
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2020	Completed		Local Plans and Regulations				Public Works and Community Development departments	Pre 1990	Medium		Low	City's General Fund; Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	Ongoing		Local Plans and Regulations	Medium	New	Development in flood zones is prohibited by code. If flood prone areas are incorporated in a large development the area is typically used as green space.	City's Community Development and Public Works departments	Ongoing	Medium		High	HMGP, BRIC
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing		Structure and Infrastructure Projects	Medium	New	The city has very few flood plain areas within the current boundaries. However, there has been an area identified in the intent to annex area that would be suitable for some of these uses. If the area is annexed these applications will be considered.	Community Development, Public Works, and Parks departments	Ongoing	Will reduce floodplain vulnerability and increase greenspace.	Planning	Low	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented jointly.A30	2020	Ongoing		Local Plans and Regulations	Medium	Existing	The City partners with the Jackson County Storm water commission to identify regional initiatives and programs.	Jackson County Storm water Commission	Ongoing	Medium		$7,500 per year	City's General Fund; Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.													

a. Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Structure and Infrastructure Projects	Medium	Existing	The city works with each property owner on a case by case basis to identify solutions to flooding in buildings.	Public Works	Ongoing	Medium		Dependent on the number of significant rain events per year.	General Fund
b. Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2020	Completed		Structure and Infrastructure Projects				Public Works	Ongoing	Medium		High	HMGP, BRIC
c. Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2020	Completed		Structure and Infrastructure Projects				Public Works	Ongoing	Medium		High	HMGP, BRIC
d. As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Deferred	This initiative has been deferred until funds become available.	Structure and Infrastructure Projects				Public Works	Ongoing	Medium		High	HMGP, BRIC
Discourage new development in floodplains and flood-prone areas.													
a. Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2020	Complete		Local Plans and Regulations				Community Development	Pre 2000	Medium		Low	City's General Fund; Staff Time
Improve flood hazard assessments and flood mapping.													
**a. Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Low	Existing	The data is available through the City's GIS system.	Community Development	Ongoing	Medium		Low	General Fund
b. Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2020	Completed		Local Plans and Regulations				Community Development	October 2007	Medium		Low	City's General Fund; Staff Time
Enhance public awareness and education efforts related to flooding.													
b. Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2020	Deferred	Standard practice is to direct interested parties to the FEMA website. Brochures available at City Hall and local libraries and City Website.	Education and Awareness Programs				Community Development	Ongoing	Medium		Low	City's General Fund
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.													
a. Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Completed	Participation began in 2018	Local Plans and Regulations					September 1978	Medium		Low	General Fund
**b. Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	High	New	Project Plan Review	Public Works Engineering	Ongoing	Medium		Low	General Fund
Goal: Develop plans and adopt policies to address sound stormwater and flooding challenges													
Mitigation Action: Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	no costs identified	City Council	Ongoing	Medium		Low	City's General Fund; Staff Time
To continue to monitor for possible flooding issues within the city and adapt solutions to correct the issues when they arise.													

Monitor for FEMA Flood Map updates	2020	Ongoing		Local Plans and Regulations	High	Overall	Flood Plain Management	Planning and Development Department	Ongoing	Medium	N/A	Low	General Fund
Update DAM EAP Annually	2020	Ongoing		Local Plans and Regulations	High	Yes	Local Emergency Operations Planning	Public Works	Annual	Medium	N/A	Low	General Fund
Severe Winter Weather													
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of severe winter weather.													
a. Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2020	Completed		Local Plans and Regulations	High				pre 1990 mid level transmission lines	Medium		Low	City's General Fund; Staff Time
b. Offer incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing		Local Plans and Regulations			Department discussions with the utility provider.	Kansas City Power & Light	Ongoing	Medium		Low	Utility
Ensure local governments and human services agencies are aware of facilities across the Kansas City area with generators or emergency power that can be used as shelters in the event of severe winter weather.													
a. Partner with MARC, the American Red Cross, Salvation Army and other stakeholders to inventory public, private and non-profit facilities that have generators or emergency power and can be used as shelters in the event of severe winter weather.	2020	Ongoing		Local Plans and Regulations	Medium	New	Discussions and project reviews.	Blue Springs and CJCEMA	Ongoing	Medium		Low	Developer
b. Retrofit otherwise suitable existing facilities with generators for emergency power.	2020	Ongoing		Structure and Infrastructure Projects	High		MARC emergency management in conjunction with Central Jackson County Emergency Management.	MARC	ongoing	Medium		Medium	MARC Participating agencies
c. Consider the adoption of policies requiring generators or other emergency power systems in the construction of new public facilities.	2020	Ongoing		Local Plans and Regulations	Medium	New	Strategic planning and plan review.	City/ owner/ developer	ongoing	Medium		Low	Owner / developer
Since traffic accidents account for 70% of injuries related to ice and snow, develop and implement programs to improve road conditions and protect motorists during severe winter weather													
a. Budget for the stockpiling of sand, salt and other materials necessary to reduce or eliminate ice on roadways and improve road conditions.	2020	Completed		Local Plans and Regulations				Public Works	Pre 1984	Medium		Low	City's General Fund; Staff Time
Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.													
a. Offer economic incentives to encourage water conservation, e.g., through modification of water rate structures.	2020	Ongoing		Local Plans and Regulations	Medium	Existing	The water rates are set in a tiered structure with prices increasing as certain levels are reached.	Blue Springs Water Department	On going	Reduction in water usage overall.		0$	City's General Fund; Staff Time
b. Develop and implement water conservation ordinances.	2020	Ongoing		Local Plans and Regulations	Medium	Existing	Code of Ordinances - Water Rates	Blue Springs Water Department	On going	Medium		$0	City's General Fund; Staff Time
Encourage improvements to water system infrastructures to reduce vulnerability to drought and meet water use demands.													
a. Budget for infrastructure improvements to municipal water systems.	2020	Ongoing		Local Plans and Regulations	Medium	Existing	System improvements are continuously included in the Capital Improvement Program.	Blue Spring Public Works Department	On Going	Medium		$200,000 per year	Water fees
b. Develop and approve bond measures to fund improvements to municipal and/or water district water treatment plants, transmission systems, water mains and related infrastructure.	2020	Ongoing		Local Plans and Regulations	High	Existing	Capital Improvement Program	Blue Springs Public Works	On Going	Medium		$21,000,000	Water Fees and SRF bonds

c. Identify and apply for state and federal grants to improve water treatment plants, transmission systems, water mains and related infrastructure.	2020	Complete		Local Plans and Regulations				Blue Springs Public Works	January 2015 through Tri County Water Authority	Medium		Low	City's General Fund; Staff Time
To ensure an adequate water supply by maintaining contracts for water purchase from three separate entities.													
Monitor water use during times of drought and use voluntary restrictions if warranted	2020	Ongoing		Local Plans and Regulations	High	Yes	Water Modeling	Public Works	Annual	Medium	N/A	Low	City's General Fund; Staff Time
Heat Waves													
Ensure local governments and human services agencies are aware of air conditioned facilities across the Kansas City metropolitan area that can be used as shelters in the event of a heat wave.													
a. Partner with MARC, local public health agencies, emergency management agencies, the American Red Cross, Salvation Army and other stakeholders to inventory public, private and non-profit facilities that are air conditioned and can be used as "heat emergency shelters" in the event of a heat wave.	2020	Completed		Local Plans and Regulations					June 2014	Medium		Low	City's General Fund; Staff Time
b. Retrofit otherwise suitable existing facilities with air conditioning systems and designate them as shelters for use during heat waves.	2020	Completed		Structure and Infrastructure Projects					June 2014	Medium		Low	City's General Fund; Staff Time
Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.													
b. Partner with community service organizations and area businesses to provide air conditioners and/or fans to at-risk groups, low income residents and the elderly.	2020	Completed		Education and Awareness Programs				Emergency Mgt.	June 2014	Medium		Low	City's General Fund; Staff Time
Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.													
a. Develop local heat emergency plans or heat wave annexes to local emergency operations plans.	2020	Completed		Local Plans and Regulations				Emergency Mgt.	June 2014	Medium		Low	City's General Fund; Staff Time
To continue to offer air conditioned shelters during heat waves.													
Offer air conditioned facilities to the public during heat waves	2020	Ongoing	Vesper Hall is available during business hours	Local Plans and Regulations	M		CJCEMA	Blue Springs	Ongoing	Medium	As identified, 5 people in one season have used the facility while their A/C was being repaired.	Low	General Fund
Dam Failures													
Improve hazard assessment information for dams across the Kansas City metropolitan area.													
a. Work with MDNR's Water Resources Program and USACE to determine which dams in Cass, Clay, Jackson, Platte and Ray counties have had inundation studies, inundation pathway maps and emergency action plans developed.	2020	Completed		Local Plans and Regulations				Blue Springs	2007	Medium		Low	City's General Fund; Staff Time
b. Using the latest information from the NID, MDNR's inventory of dams and other sources, develop GIS layers and maps indicating the locations, inundation pathways and hazard potential of known dams within the Kansas City metropolitan area.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time

c. Obtain assessed valuation data and population figures for areas in the vicinity of dam inundation pathways so that enhanced vulnerability assessments may be conducted describing the number of lives and amount of property at risk from dam failure.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time
d. Include maps and information from inundation studies and dam emergency action plans in local emergency operations and land use plans.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time
Reduce the potential for dam failures by enhancing inspection efforts.													
b. Adopt codes or ordinances requiring permits, engineering studies and safety certifications prior to the construction of new dams.	2020	Completed		Local Plans and Regulations				Blue Springs	2007	Medium		Low	City's General Fund; Staff Time
c. Encourage the state to provide MDNR's Water Resources Program with funding necessary to regularly inspect all significant and high hazard dams in the state.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time
d. Adopt local ordinances and/or state laws requiring all dam owners do develop emergency action plans for their dams and provide local public safety agencies with copies of these plans.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time
Improve the structural integrity of dams to reduce the threat of dam failures.													
a. Budget for regular repairs and improvements to dams, particularly those that are publicly owned.	2020	Ongoing		Structure and Infrastructure Projects	Low	Existing	City's budget	Blue Springs Public Works	On going maintenance is budgeted for within the Public Works budget.	Dam erosion.		$5,000 per year.	General revenue
b. Develop and implement codes and ordinances requiring minimum site and construction standards for dams.	2020	Completed		Local Plans and Regulations				Blue Springs	2010	Medium		Low	City's General Fund; Staff Time
Improve warning and evacuation systems and procedures in the event of dam failure.													
Adopt policies, codes or ordinances discouraging development in the vicinity of dam inundation zones.	2020	Completed		Local Plans and Regulations				Blue Springs	2012	Medium		Low	City's General Fund; Staff Time
To update the Dam Emergency Action Plan annually.													
Update inundation maps in the Dam EAP as provided in the USACE	2020	Ongoing		Local Plans and Regulations	High	Yes	Dam Emergency Action Plan	Public Works	Ongoing	Included in general operational costs	N/A	Low	City's General Fund; Staff Time
Severe Thunderstorms													
To maintain the level of awareness and public education concerning severe thunderstorms as guided by the NWS.													
To maintain the level of awareness and public education concerning severe thunderstorms as guided by the NWS.	2020	Ongoing		Education and Awareness Programs				CJCFPD	Ongoing	Medium		Low	City's General Fund; Staff Time

2025 Central Jackson County Fire Protection District Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Establish locations throughout the community that can be used as shelters for those who need it during severe thunderstorms and tornadoes.										
	2025	New		Local Plans and	Medium	Ongoing	Medium	fire district	Low	Local Budgeted
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing		Structure and Infrastructure	Medium	ongoing	Medium	fire district	Low	Local Budgeted Funds and Staff
Construct safe rooms or shelters in public facilities	2020	Ongoing		Structure and Infrastructure	Medium	ongoing	Medium	city and fire district	High	HMGP, BRIC
Ensure Alert, Warning and Mass Notification systems are in place and operational.										
Evaluate the need for new storm sirens or to upgrade technology to ensure that all parts of the fire district's service area, including Blue Springs and Grain Valley, may be warned during severe weather.	2020	Ongoing		Structure and Infrastructure Projects	High	ongoing	Medium	fire district	High	HMGP, BRIC
Floods										
Educate the public on the seriousness of flooding.	2025	New		Education and Awareness Programs	Low	Ongoing	Low	fire district	low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Educate the public on the seriousness of severe thunderstorms.										
	2025	New		Education and Awareness Programs	Medium	Ongoing	Medium	fire district	Low	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Establish warming shelter locations throughout the community for those who need it.										
	2025	New		Local Plans and Regulations	Medium	Ongoing	Medium	fire district	Low	Local Budgeted Funds and Staff Time
Extreme Temperatures										
Establish cooling shelters around the community for those that need it.										
	2025	New		Local Plans and Regulations	Medium	Ongoing	Medium	fire district	Low	Local Budgeted Funds and Staff Time

2025 Grain Valley Mitigation Strategy

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Applies to Community Assets (New/Existing)	Primary Agency Responsible for Implementation/ Administration	Cost / Benefit Review	Estimated Cost ($)	Funding Source
Tornadoes										
Review public warning systems, including outdoor sirens. If needed, use city communications to increase awareness and promote safe actions.	2025	new		Education & Awarene	Low	new	public works	low cost relative to benefit	Low for education	City budget
Floods										
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Continue to participate in the National Flood Insurance Program (NFIP)	2025	new	Current NFIP Participant	Local Plans and Regulations	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	low cost	city resources
Severe Thunderstorms										
Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.										
Use social media, poster presentations, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	2025	new	Continuous project	Education and Awareness Programs	medium	Continuous project	low cost	emergency management	Low	city resources
Extreme Temperatures										
Protect residents during times of extreme heat or cold										

2025 Grandview Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Assist housing and business recovery										
Educate and awareness	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Collect and dispose of debris										
Contract debris disposal	2015	Ongoing	We view this as part of a response plan versus mitigation.	Local Plans and Regulations	High	As needed	Medium	public works	Medium	Local Budgeted Funds and Staff Time
Educate and awareness	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Place directional signage	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing	Currently only required where change of impact. Review current process/code for update possibility. Community Development, Building Services.	Local Plans and Regulations	Medium	Ongoing	Medium	building services	High	HMGP, BRIC
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing	Adopt 2018 Building Code. Community Development, Building Services.	Education and Awareness Programs	Medium	Ongoing	Medium	building services	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing	Review options with adoption of 2018 Building Code and Zoning Updates.	Local Plans and Regulations	Medium	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing	Start conversation on requiring in commercial developments.Community Development.	Local Plans and Regulations	Medium	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Community Development, Building Services.	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing	Future code changes will change from recommendation to requirement. Community Development.	Local Plans and Regulations	Medium	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time

Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing	Report any identified concerns to KCP&L.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	local utilities	High	HMGP, BRIC
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing	Seek possible incentives that are available to complete this. Administration.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	city administration	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	Share assessment report completed by Fire Department with Hazard Mitigation Committee.	Local Plans and Regulations	Medium	Ongoing	Medium	fire department	Low	General fund - plan review fees
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing	Update with new building code and zoning updates in 2020. Community Development, Building Services.	Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	Hazard mitigation committee review assessment report and determine action needed based on review.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Previously deferred, need to create materials for distribution. Community Development, Building Services.	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing	Previously deferred, need to reach out to trade organization to develop workshop. Community Development, Building Services.	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Restore transportation network										
Clean Streets	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time
Dispose of debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time
Secure property										
Establish Boundaries	2015	Ongoing	We do not currently have a comprehensive plan addressing this. Addressed as needed. Create policy to ensure needs are met and process is identified. Fire Department.	Local Plans and Regulations	High	As needed	Medium	first responders	Low	Local Budgeted Funds and Staff Time

Provide Fencing	2015	Ongoing	We do not currently have a comprehensive plan addressing this. Addressed as needed. Create policy to ensure needs are met and process is identified. Public Works.	Structure and Infrastructure Projects	High	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time
Provide shelter and water	2015	Ongoing	We do not currently have a comprehensive plan addressing this. Addressed as needed. Create policy to ensure needs are met and process is identified. Administration, Outside resources.	Local Plans and Regulations	Medium	As needed	Medium	city administration	Low	Local Budgeted Funds and Staff Time
Floods										
Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	We have an ordinance that prohibits building in the floodplain. Share information with any homes previously built in floodplain. Community Development.	Education and Awareness Programs	Medium	Ongoing	Medium	community development	Low	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing	Obtain and share via social media and material at apartment complexes. Community Development, Communications Manager.	Education and Awareness Programs	Low	Ongoing	Medium	community development	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing	Community Development.	Education and Awareness Programs	Low	Ongoing	Medium	community development	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	Dangerous Building program along with seeking funding options. Community Development, Public Works.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	community development	$1,000 per year	General Fund
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	Community Development, Public Works.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	$1,000 per year	General Fund
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing	Back-flow prevention options. Public Works.	Structure and Infrastructure Projects	Low	Ongoing	Medium	public works	$500 per year	General Fund
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing	Complete inventory of structures impacted in the past. Community Development, Public Works.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	$5,000 per year	General Fund
Implement or improve flood warning systems.										

Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing	Review current methods to disseminate information. Seek funding for weather radio program. Emergency Management, Communications Manager.	Local Plans and Regulations	High	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing	Develop list of partners and plan to accomplish. Public Works.	Education and Awareness Programs	Low	Ongoing	Medium	public works	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2010	Ongoing	Public Works	Local Plans and Regulations	Low	Ongoing	Medium	public works	10000	HMGP, BRIC; General Fund
**Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Ongoing	Complete and share with Hazard Mitigation Team. Community Development, Public Works.	Local Plans and Regulations	Low	Ongoing	Medium	public works, community development	$5,000 per year	General Fund
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing	Data available. Create GIS mapping and share with Hazard Mitigation team. Community Development.	Local Plans and Regulations	Medium	Ongoing	Medium	community development	Low	General Fund
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Completed	Flood map has been updated. Continue monitoring of current boundaries to ensure accuracy.Public Works.	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	$2,500 per year	General Fund
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing	Include in Comprehensive Plan Update. Identify locations and develop ideas. Develop policy. Community Development, Parks, Public Works.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	community development, parks, public works	Low	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing	Update zoning and sub-division regulations to ensure adequate requirements. Individual plan review. Public Works, Community Development.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	community development, parks, public works	Low	HMGP, BRIC
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	Seek funding sources. Community Development, Parks, Public Works.	Local Plans and Regulations	Medium	Ongoing	Medium	community development, parks, public works	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing	Develop policy. Community Development, Parks, Public Works.	Local Plans and Regulations	Medium	Ongoing	Medium	community development, parks, public works	Low	Local Budgeted Funds and Staff Time

Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2010	Ongoing	Create list of partners and meet to discuss options available. Approach home owners identified at risk. Develop policy. Community Development, Parks, Public Works.	Local Plans and Regulations	Medium	Ongoing	Medium	community development, parks, public works	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	Dangerous Building program along with seeking funding options. Community Development, Public Works.	Structure and Infrastructure Projects	Low	Ongoing	Medium	community development, public works	$500 per year	HMGP, BRIC; General Fund
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing	Add requirement to new zoning in areas that do not restrict building. Develop list of properties at risk and approach owners. Seek funding to assist with cost. Community Development, Business Services.	Structure and Infrastructure Projects	Low	Ongoing	Medium	business services	$2,500 per year	Permit fees
Severe Thunderstorms										
Restore Street System										
Clean debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	Medium	public works	Medium	Local Budgeted Funds and Staff Time
Dispose of debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Structure and Infrastructure Projects	High	As needed	Medium	public works	Medium	Local Budgeted Funds and Staff Time
Restore utilities										
Clear transportation networks	2015	Ongoing	We view this as part of a response plan versus mitigation.	Local Plans and Regulations	High	As needed	Medium	public works	Medium	Local Budgeted Funds and Staff Time
Educate and awareness	2015	Ongoing	Social media and newsletters are used to help educate when disasters occur. Communication Manager, Public Works.	Education and Awareness Programs	High	As needed	Medium	public works, communications	Low	Local Budgeted Funds and Staff Time
Plan infrastructure/Grid protection	2015	Ongoing	Coordinate with KCP&L as needed.	Structure and Infrastructure Projects	Medium	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time
Provide temporary shelter and water	2015	Ongoing	Share shelter plan with Hazard Mitigation team. Public Works.	Local Plans and Regulations	Medium	As needed	Medium	public works	Low	Local Budgeted Funds and Staff Time

Greenwood 2025 Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Community education for all types of disasters includiing tonadoes, winter weather, heat and severe storms among other types of emergencies and disasters.										
Prepare and disseminate information to residents and those working in the city through employers on emergency preparedness tips.	2020	Ongoing	Ongoing	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	low cost	city resources
To increase access to safe rooms or shelters for our residents.										
Identify buildings in the city that could be used as storm shelters and determine if additional shelter space is required.	2020	Ongoing	Ongoing	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	low cost	city resources
Seek funding to build storm shelters as part of new public buildings or to retrofit existing buildings to increase storm shelter space in the city	2020	Ongoing	will seek funds once planning work is completed	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	low cost	HMGP, BRIC
Floods										
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing	Current NFIP Participant	Local Plans and Regulations	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	low cost	city resources
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing	Ongoing	Local Plans and Regulations	Low	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	low cost	city resources
Heat										
Implementing education as well as working on ways to help with the vulnerable populations to provide options for cooling in the summer months.										
Identify vulnerable populations in the city and determine how to assist them during severe heat	2020	Ongoing	Ongoing	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	low cost	city resources
Severe Winter Weather										

To help support vulnerable persons in our community during severe winter weather if power is affected.										
Identify vulnerable populations in the city and determine how to assist them during severe winter weather	2020	Ongoing	Ongoing	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	low cost	city resources

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity (2025)	Priority	Applies to Community Assets (New/Existing)	Existing Local Planning Mechanism through which the action was/will be implemented	Primary Agency Responsible for Implementation/ Administration	Date for Completion	Cost / Benefit Review	Target Capacity (2030)	Estimated Cost ($)	Funding Source
Tornado													
1. Increase public awareness and understanding the benefits of "safe rooms."													
a. Develop, distribute informational materials on safe rooms and storm shelters.	2026	Ongoing	Implemented through the City's preparedness educational and outreach program with emphasis on existing shelter facilities located throughout the City	Public Education and Awareness	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	Ongoing	Low/no cost mechanism to increase public safety.	An educated public has knowledge and access to safe rooms and shelters.	Low	City's General Fund
b. Partner w/ trade organizations, community-based-organizations and not-for-profit organizations to conduct safe room workshops.	2027	Ongoing	Work with private facilities, City and County volunteer groups, neighborhood groups, the City PIO and the Independence School District to put on workshops and classes to increase "Safe Room" awareness and utilization during severe weather events.	Public Education and Awareness	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	Ongoing	Low/no cost mechanism to increase public safety.	A variety of reliable partner organizations collaborate on providing safety information and awareness.	Low	City's General Fund
2. Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.													
a. Review existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2027	Ongoing	The City of Independence has designated safety locations in all City facilities for staff and visitors to shelter in during severe weather events. As a "Storm Ready" Community each facility has an "All-Hazard" weather radio and a method of being contacted by the EOC	Local Planning an	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	Ongoing	Low/no cost mechanism to increase public safety.	50% of facilities have access to shelters	Low	City's general fund
b. Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2028	Ongoing	The city continues to try and develop storm shelters in existing public facilities as funding and opportunities become available.	Local Planning an	High	Existing	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division	Ongoing	High cost to retrofit existing buildings but can also prevent large number of injuries and fatalities. Some cost could be subsidized by tax incentives and grants	50% of facilities have access to shelters	High	City's General Fund, Grants, or other future sources
c. Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2029	Ongoing	The City does not have any tax incentives for residential/ commercial builders/developers to construct safe rooms/community shelters in new public facilities due to economic conditions and City finances.	Local Planning an	High	New	Utilize Community Development Department regulatory systems and infrastructure Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division and Community development Department	2018	No cost to advocate and build awareness in the public. High cost to retrofit existing buildings but can also prevent large number of injuries and fatalities. Some cost could be subsidized by tax incentives and grants	50% of facilities have access to shelters	Med	City's General Fund, Grants, or other future sources
3. Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.													

a. Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2026	Ongoing	The City does not have any tax incentives for residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities due to economic conditions and City finances.	Structure and Infrastructure Projects	Med	New	Emergency Preparedness Division functions within City ordnances and codes	Community Development	2028	Low cost to the City. Significant cost to developers.	50% of facilities have access to shelters or safe rooms	Low to High	City's General Fund, Grants, or other future sources
b. Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2026	Ongoing	The City of Independence continues to work with all schools and non-governmental entities to promote the benefits of Safe Rooms in all public educational outreach materials.	Education and Awareness Programs	High	New	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Office	On-Going	Low/no cost mechanism to increase public safety.	50% of facilities have access to shelters or safe rooms	Low	General Funds and EMPG grants
c. Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2026	Ongoing	The City of Independence has an ordinance in place requiring all pre-manufactured home parks to include a community shelter for their residents if they expand or build a new facility. Other ordinances for apartment complexes and other large venue complexes are being considered.	Local Planning and Regulations /Education and Awareness Programs	High	New	Emergency Preparedness Division functions within City ordnances and codes	Community Development	On-going	High cost to design and build shelter facilities but can prevent large number of injuries and fatalities. Some cost could be subsidized by tax incentives and grants	50% of facilities have access to shelters or safe rooms	High	Private Sector Funding
4. Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.													
a. Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2027	Ongoing	The Community Development Department adheres to the standards outlined in the 2012 International Building Code.	Local Planning and Regulations /Education and Awareness Programs	Med	New	The City of Independence, Missouri uses the following building codes: 2018 International Residential Code (IRC) 2018 International Building Code (IBC) 2018 International Existing Building Code 2018 International Fire Code 2018 International Mechanical Code 2018 International Plumbing Code 2018 International Fuel Gas Code 2017 National Electrical Code 2010 ADA Accessibility Requirements The city also adopted the 2024 edition of the International Residential Code with 2024 Energy Code Amendments.	Community Development	On-going	Low cost to the City. Significant cost to developers.	New construction has improved storm resistance.	Medium	City's General Fund, Grants, or other future sources

b. Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2027	Ongoing	The Community Development Department adheres to the standards in the 2012 International Building Code.	Local Planning and Regulations /Education and Awareness Programs	Med	New	See above.	Community Development	On-going	Low cost to the City. Significant cost to developers.	New construction has improved storm resistance.	Medium	City's General Fund, Grants, or other future sources
c. Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2027	Ongoing	The Community Development Department adheres to the standards outlined in the 2012 International Building Code.	Local Planning and Regulations /Education and Awareness Programs	Med	New	See above.	Community Development	2028	Low cost to the City. Significant cost to developers.	New construction has improved storm resistance.	Medium	City's General Fund, Grants, or other future sources
5. Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.													
a. Anchor or strengthen above-ground transmission lines, poles and similar structures.	2027	Ongoing	There is currently no funding available to encourage this mitigation action. Independence Power and Light (IPL) does offer residents a discounted price for burying electrical lines. This discount is offered because of bulk pricing agreements negotiated between IPL and the associated contractors.	Structure and Infrastructure Projects	High	Existing	Independence Power and Light Operations	Independence Power and Light	2035	High cost yielding high benefits in preserving life and property especially in regard to access and functional needs populations.	Practically all above ground power lines are below ground.	High	Rate surcharges, City's General Fund, Grants, or other future sources
c. Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2027	Ongoing	Independence Power and Light is a city owned utility. There is currently no mitigation money being used to bury power lines. Residents can get a discount for burying their lines due to a bulk pricing agreement with contractors.	Structure and Infrastructure Projects and Structure and Infrastructure Projects	High	Existing	Independence Power and Light Operations	Independence Power and Light	2035	High cost yielding high benefits in preserving life and property especially in regard to access and functional needs populations.	Practically all above ground power lines are below ground.	High	Rate surcharges, City's General Fund, Grants, or other future sources
6. Encourage Water Utility to install generators for emergency power should power lines go down.													
a: Install natural gas fired generator and all necessary appurtenances to allow water plant to operate at the minimum day usages should electric power be disrupted.	2029	Ongoing	The Water Plant currently has power supplies from two lines served by KCPL. If KCPL was unable to supply the electricity, the water plant would not be able to provide water which is an essential service to the community.	Solar with redundant system for climate adaption	High	New and existing	Planning by Water Pollution Control and Independence Power and Light	Water Pollution Control and Independence Power and Light	2030	Initial investment will be high but resiliency gained will be substantial.	Project completed by 2029	Medium	City's General Fund, Grants, or other future sources
7. Increase capabilities to provide mass notifications to the public and increase coordination among city departments during times of severe weather.													
a. Maintain the Mass Notification System to inform residents and city employees during severe weather.	2025	Ongoing	Implement a citywide notification system that can warn residents of severe weather events and other natural and manmade hazards. The system can also help facilitate effective response with city employees, volunteers, faith based partners etc.	Education and Awareness Programs	High	Existing	Expand current system (RAVE) Work with other City departments through local ordnances to fund, implement, manage and maintain.	Emergency Preparedness	Unknown	Would give residents enhanced warnings and improved response coordination but would have a high implementation and maintenance cost.	2027	Medium	City's General Fund, Grants, or other future sources

b. Expand, maintain, upgrade, and modernize city wide Tornado Siren network.	2025	Ongoing	The City of Independence is a continually growing city, and as the city grows it can outgrow the footprint of our established tornado siren capabilities. Additionally, technological failures or changes can require siren infrastructure to be upgraded, changed, or added to in order to maintain capabilities and viability. This can include access, operating systems, and cybersecurity.	Education and Awareness Programs and Structure and Infrastructure Projects	High	Existing	Emergency Preparedness Division will have the lead planning duty, but will coordinate with the city Emergency Communication Center as the 24-hour backup location for siren control.	Emergency Preparedness	Ongoing	Maintenance and required upgrades have a moderate ongoing yearly cost, while expansion costs can be high. As the most visible and commonly used method of warning, ensuring there is no lapse of coverage or use is vital to ensuring life safety to anyone outside during severe weather.	2027	Medium - High	City's General Fund, Grants, or other future sources
Flooding													
1. Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.													
**a. Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2026	Ongoing	The City of Independence tracks all repetitive loss properties and works with the owners to mitigate potential flood losses through potential development and storm drainage enhancements.	Structural and Non -structural flood mitigation.	High	Existing	City Codes and Community Development Plans	Public Works/Water Pollution Control	Ongoing	Preventing future flooding of properties that have had history of flood damage	Practically no flood endangered properties and structures not meant to withstand flooding are in flood plains.	Low	City General Funds and Stormwater Sales Tax
**b. Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2026	Ongoing	The City of Independence constantly tries to identify potential funding sources to mitigate flood losses to repetitive loss properties. This sources include private, local, state and federal grants.	HMGP - Flood Property Buyouts	Medium	Existing	City Codes and Community Development Plans	Public Works/Water Pollution Control	Ongoing	Preventing future flooding of properties that have had history of flood damage	Practically no flood endangered properties and structures not meant to withstand flooding are in flood plains.	High	City General Funds and Stormwater Sales Tax
**c. As funding allows, target repetitive flood loss properties and structures for buyout.	2026	Ongoing	The City of Independence, since 1982, has worked with property owners, using city, State and Federal funding, to buyout over 58 properties that were considered repetitive loss or severe repetitive loss properties. The City continues to apply for funding opportunities to remove targeted repetitive loss properties.	HMGP - Flood Property Buyouts	High	Existing	City Codes and Community Development and Storm water plans	Public Works/Water Pollution Control	Ongoing	Preventing future flooding of properties that have had history of flood damage	Practically no flood endangered properties and structures not meant to withstand flooding are in flood plains.	High	HMGP, BRIC, FMA

**d. With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2026	Ongoing	The City of Independence continually works with property owners to mitigate future flood losses. While economic incentives are not always implemented many educational programs such as building water gardens, backflow valves and landscaping are done.		High	New & Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordnances	Emergency preparedness	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	Practically no flood endangered properties and structures not meant to withstand flooding are in flood plains.	Low	City's general fund
2. Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.													
a. Consider the construction of detention basins, small lakes and greenways or conserving riparian corridors in areas of new development to channel and capture storm water, thereby reducing the likelihood of flooding.	2027	Ongoing	The City continues to maintain and expand a network of regional detention basins to help reduce flooding potential and impacts throughout the city. Native plantings are used within the network of detention basins, incorporating water quality improvement potential. In the current 5-year plan, planning and design work for the Bundschu detention basin, along Bundschu Road, will occur. The City has already implemented a riparian corridor preservation program and will continue to implement this conservation program for all new developments.	FMA/PDM or now called Building-Resilient-Infrastructure-Communities (BRIC)	High	New	Storm water and Community Development Plans	Water Pollution Control	Ongoing	Will prevent flooding for moderate costs	Substantial capability to retain and divert storm water. Capability throughout all City flood plains.	Medium	HMGP, BRIC, FMA
b. In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2027	Ongoing	The City of Independence, since 1982, has worked with property owners, using city, State and Federal funding, to buyout over 58 properties that were considered either repetitive loss or severe repetitive loss properties. The City continues to apply for funding opportunities to remove targeted repetitive loss properties. As part of these buyouts, each property is deed restricted, requiring the land to be used for open space.	BRIC / HMGP - Flood Property Buyouts	High	Existing	City Codes and Regulations	Public Works	Ongoing	Preventing future flooding of properties that have had history of flood damage	Substantial capability to retain and divert storm water. Capability throughout all City flood plains.	High	HMGP, BRIC, FMA
c. Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2027	Ongoing	The City continues to apply for State and Federal grants to support and enhance flood mitigation and prevention programs. This includes identifying funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	BRIC and Flood Water Reduction/Storm water Conveyance Improvements	High	Existing	City Codes and Regulations	Water Pollution Control and Public Works Department	On-going	Preventing future flooding of properties that have had history of flood damage	Substantial capability to retain and divert storm water. Capability throughout all City flood plains.	Low	City general funds and/or grant funding

d. Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2027	Ongoing	Where applicable, flood buyout properties will be evaluated for future usage, including sports fields, parks, wildlife habitats, etc. In most cases, the areas will qualify as riparian corridor and be allowed to be naturally restored.	BRIC and HMGP - Flood Buyouts	Medium	Existing	City Codes and Regulations and NFIP CRS programs	Water Pollution Control and Public Works Department	Ongoing	Preventing future flooding of properties that have had history of flood damage	Substantial capability to retain and divert storm water. Capability throughout all City flood plains.	High	City general funds and/or grant funding
e. Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2027	Ongoing	The City works with property owners and other stakeholders to develop and implement flood mitigation strategies which promotes protection of fish and wildlife habits. Water Pollution Control works with partner organizations including volunteer groups. For instance, the Stream Clean initiative has worked to improve stream and runoff improvements The City continues to find opportunities with volunteer organizations to promote wildlife habitats.	BRIC and Planning Strategies and Flood Plain Mitigation Grants	Medium	Existing	Emergency Preparedness Division function within City ordnances and codes	Water Pollution Control and Public Works Departments	Ongoing	Natural riparian corridors restored and preserved result in improved water quality.	Substantial capability to retain and divert storm water. Capability throughout all City flood plains.	Low	Stormwater Sales Tax funds & Regional Detention funds
f. Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented jointly.	2027	Ongoing	The City has on-going programs to educate the public about flooding and its associated hazards. This program includes standardized educational materials coordinated with local and regional partners. City departments also participate in local, regional, State and national public educational events such as Safety City and Eco-Fest, hosted by the City each year. The City's stormwater sales tax, approved by vote and established in 2000, secures funds for stormwater mitigation activities. Oversight of the sales tax usage is comprised of the Stormwater Oversight Committee (SWOC), consisting of Independence citizens. The Committee meets quarterly and includes presentations to Council to help educate about the program's achievements.	BRIC and Planning Strategies and Flood Plain Mitigation Grants	High	Existing	City departmental functions within Water Pollution Control Division, Municipal Services (includes Flood Plain Management) and Emergency Preparedness Division. City ordnances and codes	Water Pollution Control and Public Works Department and Emergency Preparedness Division	On-going	Low/no cost mechanism to increase public safety.	Increased public awareness and support for stormwater control projects..	Low	Stormwater Sales Tax funds & Regional Detention funds

g. Engage both public and private stakeholders in flood control projects to encourage mutually beneficial activities to promote flood control with other stakeholder goals.	2027	Ongoing	The City has on-going programs to educate the public about flooding and its associated hazards. When Water Pollution Control determines the need for a regional detention basin within an area, public meetings are held with property owners to discuss the flood control needs of the project. Public comments help steer design considerations to address the flood control efforts as well as mutually beneficial activities. For instance, in the 39th Street and Phelps detention basin, trails were incorporated to help promote public engagement with the native plants and ecosystem.	Public Education	Medium	New and Existing	City departmental functions within Water Pollution Control Division, Municipal Services (includes Flood Plain Management) and Emergency Preparedness Division. City ordnances and codes	Water Pollution Control	Ongoing	Low	Increased public awareness and support for stormwater control projects.	Low	Stormwater Sales Tax funds & Regional Detention funds
3. Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.													
a. Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2026	Ongoing	Stormwater Management Plan The Municipal Services Department oversees and maintains the City of Independence Municipal Separate Storm Sewer System (MS4). This system is made up of more than 13,800 structures, 230 miles of stormwater pipe, 19 regional detention basins, all within 23 local watersheds. Stormwater Management Plan Objectives In addition to maintaining stormwater infrastructure Municipal Services operates an Environmental Compliance Program. The purpose of this program is to protect human health and the environment by reducing pollutants released into our local waterways. National Pollutant Discharge Elimination System Permit The Environmental Compliance Program oversees compliance with the Missouri Department of Natural Resources, National Pollutant Discharge Elimination System	Elevation of Mechanical Systems/Risk Mitigation	High	Existing	City departmental functions within City ordnances and codes	Water Pollution Control and Emergency Preparedness Division	Ongoing	Low/no cost mechanism to increase public safety and reduce high cost flood damages	2028	Low	City general funds and/or grant funding
b. Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2026	Ongoing	All City departments work to reduce flood damages to infrastructure when designing new projects and mitigate current facilities as funding is available.	Elevation of Mechanical Systems/Risk Mitigation	High	New & Existing	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	All City Departments	Ongoing	While this may increase building and development costs, will reduce significant flood impacts	2028	Medium	City general funds and/or grant funding

c. Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2026	Ongoing	The City owns the water, electrical and sewer utilities and assess their facilities, distribution systems, etc. for vulnerability to flooding. Each vulnerability is evaluated and where applicable, the Utility tries to retrofit or modify the facility to reduce flood risk.	Risk Reduction by Mitigation	Medium	New & Existing	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	City Utility Departments	Ongoing	While initial cost is high, will reduce recovery and replacement costs from flooding events	2028	High	City general funds and/or grant funding
d. As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2026	Ongoing	The City of Independence, since 1982, has worked with property owners, using city, State and Federal funding, to buyout over 58 properties that were considered repetitive loss or severe repetitive loss properties. The City continues to apply for funding opportunities to remove targeted repetitive loss properties.	HMGP - Flood Buyouts	High	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordnances	Public Works	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage	2028	High	City general funds and/or grant funding
e. Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2026	Ongoing	The City of Independence constantly tries to identify potential funding sources to mitigate flood losses to repetitive properties by encouraging owners and businesses to elevate their structures in flood prone areas	BRIC and Structural and Non-Structural Flood Mitigation	Med	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordnances and as Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Public Works	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage	2028	High	Private Sector and City general funds and/or grant funding
f. Elevate public facilities, commercial businesses, and residential structures to reduce flood risk.	2026	Ongoing	The City is a participating community in the National Flood Insurance Program (NFIP). This program requires elevation of structures above the base flood elevation (BFE) determined for the 1% storm with 1 foot of freeboard. Information is based on the 2017 flood insurance rate maps (FIRM) adopted January 2017. Building above the 1% BFE helps reduce flooding potential.	BRIC and Flood Risk Mitigation	High	New		Public Works	Ongoing	Raising the structure's base floor elevation versus the base flood elevation reduces risk of flooding for larger storm events (i.e. the 1% or 100-year frequency storm).	2028	Low	Pubic/private partnering
**g. Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2026	Ongoing	The City of Independence constantly tries to identify potential funding sources to mitigate flood losses to repetitive properties by encouraging owners and businesses to retrofit their structures to prevent flooding. The City will be to partner with the US Army Corp of Engineers through their Silver Jackets program, to help provide flood mitigation strategies for vulnerable structures.	BRIC and Structural and Non-Structural Flood Mitigation	High	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordnances and as Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Public works and Emergency Preparedness Division	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage	2028	High	Private Sector and City general funds and/or grant funding

h: Identify storm sewer and waste water systems to identify and upgrade areas where infrastructure needs repair, replacement, or upgrade	2026	Ongoing	The City of Independence is constantly growing, changing, expanding. Existing stormwater systems might not be adequate to properly contain, control, or convey stormwater flow, which increases the potential for flooding of structures and properties. The Stormwater Sales Tax and Program provides a system of project evaluation and rating to prioritize stormwater improvement projects throughout the city. Since its inception in 2000, the program has completed over 100 projects, helping to reduce flood occurrences.	BRIC and System Upgrades and Rehabilitation	High	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordnances and as Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Public Works, Water Pollution Control, Emergency Preparedness Division	Ongoing	High cost of repair, but can result in extremely high flood loses if there is a system failure or overload	2028	High	Stormwater Sales Tax and sanitary sewer fee/rates
4. Improve flood hazard assessments and flood mapping.													
**a. Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing	The City has adopted the City continues to review flood hazard areas and incorporate necessary changes as needed. To assess risk levels the City will utilize FEMA's Map Service Center msc.fema.gov/portal/home or www.floodsmart.gov/ The City's Floodplain Administrator will coordinate how to address mapping concerns.at 816-325-7614	Planning strategy to keep new developments or redevelopment out of floodplains	Medium	New and Existing Areas	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Water Pollution Control, Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	2029	Low	City's General Funds
**b. Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2020	Ongoing	The City currently uses the HAZUS software at for Level One reviews. It is currently exploring the future integration of GIS data to increase the accuracy of flood inundation prediction capabilities in partnership, the Water Pollution Control and Public Works Departments.	Planning strategy to keep new developments or redevelopment out of floodplains	Medium	New and Existing Areas	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Water Pollution Control, Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	2029	Low	City's General Funds
**d. Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2020	To start in 2021	The City currently uses GIS data and FEMA Mapping Technology to increase the accuracy of flood inundation prediction capabilities in partnership , the Water Pollution Control and Public Works Departments.	Planning strategy to keep new developments or redevelopment out of floodplains	Medium	New and Existing Areas	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2006 codes (January 2009)	Water Pollution Control, Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	2029	Low	City's General Funds

e. Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2020	To start in 2022	The City currently uses GIS data and FEMA Mapping Technology to increase the accuracy of flood inundation prediction capabilities in partnership , the Water Pollution Control and Public Works Departments.	Planning strategy to keep new developments or redevelopment out of floodplains	Medium	New and Existing Areas	City departmental functions within City ordnances and codes and Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Water Pollution Control, Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	2029	Low	City's General Funds
f. Comprehensive Watershed Analysis and Floodplain Evaluation of the Little Blue River. Perform detail hydrologic and hydraulic modeling to accurately reflect flood zones/risks in this rapidly developing multi-jurisdictional corridor.	2020	Will start in 2021	City is working with the USACE and the Blue jacket Program to scope and prepare for this comprehensive study of the Little Blue River corridor from Lee's Summit to the Missouri River	FMA/PDM - Planning, modeling, and mapping	High	New and Existing Areas	Working with City's Departments, US Army Corp of Engineers, SEMA, and adjacent communities	Water Pollution Control, Public Works	2025	Provide reliable mapping and flood risk analysis. Other aspects of this study may include water quality assessments and improvements and especially those associated with riparian corridor preservation.	2029	Medium	City's General Funds/USACE/other federal funds
6. Enhance public awareness and education efforts related to flooding.													
a. Encourage home owners and businesses to purchase flood insurance.	2025	Ongoing	The City of Independence is a CRS community with a rating of 9 which allows for a 5% discount on the flood insurance premium. Public Works sends letters annually to property owners in the special flood hazard areas informing about topics such as flood insurance and mitigation activities. The Emergency Preparedness Division has several outreach programs to encourage home owners and businesses to purchase flood insurance. The Emergency Preparedness Division also supports the Flood Plain Manager in completing the Annual Community Rating Survey.	Public Education and National Flood Insurance Program (NFIP)	Medium	New and Existing	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to encourage flood preparedness.	2027	Low	City general funds and EMPG program grant monies

b. Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2025	Ongoing	The City's Emergency Preparedness Division, Water Pollution Control and Public Works Departments (Flood Plain Management) have an on-going program to educate the public about flooding and its associated hazards. This program includes standardized educational materials coordinated with local and regional partners. This initiative includes brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross, NFIP and other organizations.	Public Education and National Flood Insurance Program (NFIP)	Medium	New and Existing	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to encourage flood preparedness.	2027	Low	City general funds and EMPG program grant funding
c. Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2025	Ongoing	The City's Emergency Preparedness Division, Water Pollution Control and Public works Departments have on-going program to educate the public about flooding and its associated hazards. This program includes standardized educational materials coordinated with local and regional partners. City department also participate in local, regional, State and national public educational events each year.	Public Education and National Flood Insurance Program (NFIP)	Medium	New and Existing	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to encourage flood preparedness.	2027	Low	City general funds and EMPG program grant monies
7. Participate in, and ensure compliance with, flood mitigation and floodplain management programs.													
**a. Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing	The City adopted NFIP in October 1991 and has been a CRS programs participant since 10/1991. The City continues to participate in the program completing mandatory maintenance as required by program regulations.	Floodplain Management	High	New and Existing	Emergency Preparedness Division and Public Works Department functions within City ordnances and codes	Public Works Department and Emergency Preparedness Division	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	2027	Low	City General Funds
**b. Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing	The city continues to maintain up-to-date flood maps and tracks any LOMR etc. The Emergency Preparedness Division works with the local floodplain manager with our Municipal Services Dept to insure maps stay current.	Floodplain Management	High	New and Existing	Emergency Preparedness Division and Public Works Department functions within City ordnances and codes	Public Works Department and Emergency Preparedness Division	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	2027	Low	City General Funds
8. Implement or improve flood warning systems.													

a. Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2020	Ongoing	The City has installed real time weather stations and utilizes USGS real-time water data for local daily stream flow conditions which are operated in cooperation with the USGS.	Emergency Response	Medium	New and Existing	Emergency Preparedness Division, Water Pollution Control and Public Works Department functions within City ordnances and codes	Emergency Preparedness Division	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	2027	Medium	General Funds and EMPG grants
b. Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2020	Ongoing	The City has real-time weather data stations that track local rainfall amounts that are fully accessible to regional, State and Federal stakeholders. This system has been in place since 2007.	Emergency Response	Medium	New and Existing	Emergency Preparedness Division, Water Pollution Control and Public Works Department functions within City ordnances and codes	Water Pollution Control and Emergency Preparedness Division	2028	Data Sharing is a relatively low cost effective measures to warn of flooding events and implement mitigation measures. Sharing of data will improve county floodplain management.	2027	Low	General Funds and EMPG grants
c. Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	Ongoing	Currently the City working with the Army Corps of Engineers, the National Weather Service and the Public Works and Water Pollution Control Departments to acquire real-time flood inundation prediction capability using stream gauge and forecast information.	Emergency Response	Medium	New and Existing	Emergency Preparedness Division, Water Pollution Control and Public Works Department functions within City ordnances and codes	Water Pollution Control and Emergency Preparedness Division	2028	Will ensure that citizens are prepared real time for flood events.	2027	Low	General Funds and EMPG grants
9. Work with partner agencies to implement flood inundation prediction capability.													
**a. Implement flood prediction software programs in coordination with existing systems already utilized by surrounding jurisdictions	2025	Ongoing	Develop software and hardware systems in the Emergency Operations Center to help predict flooding throughout the city	Emergency Response	Medium	New	Emergency Preparedness Division function within City ordnances and codes	Water Pollution Control and Emergency Preparedness Division	2028	Will ensure that citizens are prepared real time for flood events.	2028	Medium	BRIC, HMGP, FMA
Goal: Develop plans and adopt policies to address sound stormwater and flooding challenges													
Mitigation Action: Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	no costs identified	City Council	n/a	n/a			
Winter Weather													
1. Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of severe winter weather.													
a. Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2027	Ongoing	The City of Independence Power and Light Department does not have any ordinances requiring underground placement of electrical infrastructure but has extensive mitigation programs customers can choose to participate in that place electric lines underground. Customers can pay for a portion of the cost over a period of time through their electric bill.	Education and Awareness Programs and Structure and Infrastructure Projects	High	Existing	Power & Light function within City ordnances and codes	City's Power and Light Department	On-going	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	2030	High	City's General Funds and HMGP monies

b. Offer incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2027	Ongoing	The City has extensive mitigation programs customers can choose to participate in that place electric lines underground. Customers can pay for a portion of the cost over a period of time through their electric bill.	Education and Awareness Programs and Structure and Infrastructure Projects	High	Existing	Power & Light function within City ordnances and codes	City's Power and Light Department	On-going	Would reduce recovery costs, but would have high initial implementation.	2030	High	City's General Funds and HMGP monies
c. Budget for the incremental replacement of existing above-ground utility lines with underground utility lines.	2027	Ongoing	The City has extensive mitigation programs customers can choose to participate in that place electric lines underground. Customers can pay for a portion of the cost over a period of time through their electric bill.	Education and Awareness Programs and Structure and Infrastructure Projects	High	Existing	Power & Light function within City ordnances and codes	City's Power and Light Department	On-going	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	2030	Medium	City's General Funds and HMGP monies
2. Ensure local governments and human services agencies are aware of facilities across the Kansas City area with generators or emergency power that can be used as shelters in the event of severe winter weather.													
b. Retrofit otherwise suitable existing facilities with generators for emergency power.	2025	Ongoing	The City has numerous shelters that have back-up power, but the county continues to work with existing and future shelter locations to find ways to retrofit them with emergency power.	Structure and Infrastructure Projects (BRIC)	High	Existing	Emergency Preparedness Division functions within City ordnances and codes	Emergency Preparedness Division	Ongoing	Fairly high cost installation price but will ensure continuity of shelter operations.	2030	Medium	City's General Fund, Grants, or other future sources
c. Consider the adoption of policy A77:P77s requiring generators or other emergency power systems in the construction of new public facilities.	2025	Ongoing	The City has policies in place for generators required in "Safe Room" applications. The City is also working with BRIC grants to obtain funding to pre-wire Red Cross and City identified shelters for generators. The City's Emergency Preparedness Division has an on-going program to develop relationships with potential shelters located throughout the City to pre-wire or purchase generators for their facilities.	Structure and Infrastructure Projects (BRIC)	High	New and Existing	Emergency Preparedness Division, Water Pollution Control and Public Works Department functions within City ordnances and codes	Public Works, Emergency Preparedness Division	Ongoing	Fairly high cost program to implement, but would help ensure continuity of government operations.	2030	Medium	City's General Fund, Grants, or other future sources
3. Ensure at-risk, low income and elderly residents have adequate heat in their homes.													
a. Partner with community service organizations to provide materials and volunteer labor to assist at-risk groups, low income residents and the elderly with winterizing their homes.	2025	Ongoing	The City works with the Community Services League, the Community Action Program, and the United Way to assist o assist at-risk groups to winterize their homes.	Local Planning and Regulations, Education and Awareness Programs. Education and Awareness Programs	Med	Existing	Emergency Preparedness Division within City ordnances and codes	Emergency Preparedness Division	Ongoing	Low cost mechanism to support vulnerable populations access to heating to prevent death/injury from exposure to winter storms.	2025	Low	General Funds and EMPG grants

b. Work with utility providers to develop and implement programs to reduce, eliminate or defer home heating costs for elderly, low income and at-risk people in the community.	2025	Ongoing	The City of Independence has several programs to reduce or eliminate home heating cost. The Independence Rate Assistance Program (IRAP) works with qualified low income families, elderly and special needs individuals to cut their energy bills in half. The I-SHARE program is where the City budgets money each year to match a dollar for dollar contributions donated by community partners to pay utility assistance for qualified low income households. The City's Power and Light Department also has an Average Share program where utility customers can average their electric bills over a year's period of time. The City has also started a program to pay utility customers $20.00 for every energy assistance application to apply for the Federal energy assistance program.	Education and Awareness Programs	High	Existing	Power & Light function within City ordnances and codes	City's Power and Light Department	On-going	High Cost mechanism to support vulnerable populations access to heating but can prevent high numbers of death/injury from exposure to winter storms.	2025	High	City's General Funds and grants
4. Since traffic accidents account for 70% of injuries related to ice and snow, develop and implement programs to improve road conditions and protect motorists during severe winter weather													
a. Budget for the stockpiling of sand, salt and other materials necessary to reduce or eliminate ice on roadways and improve road conditions.	2025	Ongoing	This expense is outlined in the Public Works budget on a yearly basis and funding amount is reviewed every year.	Local Planning and Regulations	Low	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Will ensure continued open roadways.	2026	Medium	General Fund
b. Work with area local governments and MARC to develop a regional "pool" of sand, salt and other materials necessary to reduce or eliminate ice on roadways.	2025	Ongoing	The City's Public Works Department works with regional partners regarding salt and sand contracts	Local Planning an	Medium	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Low cost mechanism to cost share and increase availability of sand stockpiles.	2026	Low	General Fund
c. Partner with area local governments to establish a mutual aid system for sand, salt and other materials and their delivery resources (i.e., trucks, crews, etc.).	2025	Ongoing	The City's Public Works Department is part of a regional Public Works Mutual Aid Agreement through the MARC organization	Local Planning an	Medium	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Low cost mechanism to cost share and increase availability of sand stockpiles.	2026	Low	General Fund
d. In an effort to reduce the number of people on the roadways during periods of severe winter weather, develop and implement "snow day" plans and policies for non-essential personnel and encourage private sector and non-profit employers in the community to	2025	Ongoing	The City does have procedures in-place regarding "snow days" for public employees and continues to work on educating non-governmental organizations on the hazards of employees on roadways during severe winter weather.	Local Planning an	Low	New	Public works and Law Enforcement function within Code of Ordinance	Public Works	Ongoing	Short-term potential lost productivity will be offset by savings from potential employee injury and also reduce traffic and delays that would otherwise occur.	2026	Low	General Fund
5. Enhance public awareness of severe winter weather mitigation and preparedness activities.													

a. Develop and conduct a public education and awareness campaign on properly winterizing homes.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to increase public safety.	2026	Low	City's General Funds and EMPG monies
b. Collect and disseminate public education materials that address winter weather safety, preparedness and mitigation activities.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to increase public safety.	2026	Low	City's General Funds
c. Provide vulnerable populations with winter weather safety, preparedness and mitigation information.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of severe winter weather.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to increase public safety.	2026	Low	City's General Funds and EMPG monies
d. Partner with emergency services, public health and community groups to conduct special public education events, such as a Severe Winter Weather Awareness Day.	2025	Ongoing	The City's Emergency Preparedness Division has on-going programs to educate the public about "all Hazards" safety including severe winter weather. These programs include standardized educational materials coordinated with local and regional partners. These partners include City Departments, local faith based organizations and many other public and private groups. The Emergency Preparedness Division also participates in local and regional public educational events such as Regional Readiness Fairs.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	On-going	No/low cost mechanism to increase public safety.	2026	Low	City's General Funds
Drought													
1. Assess the vulnerability of water systems.													
a. Conduct an assessment of the vulnerability and water use demand of local water systems by utilizing the procedures in the Missouri Drought Plan.	2027	Ongoing	The City of Independence Water Department continually assess the demands on the water system and has plans in place for drought emergencies	Local Planning and Regulations	High	Existing	Water Department function within City ordnances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Relatively low cost mechanism to inform mitigation strategies	2028	Low	City's General Funds
2. Ensure plans and procedures addressing local drought response, drought mitigation and long-term water planning are developed.													

a. Review the Missouri Drought Plan, as well as local drought plans available from MDNR, and develop a local drought plan.	2027	Ongoing	City is constantly utilizing local, state and federal programs and guidance regarding long term planning	Local Planning and Regulations	Medium	Existing	Water Department function within City ordnances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.	2028	Low	City's General Funds
b. Develop local procedures implementing the provisions of the Missouri Drought Plan.	2027	Ongoing	City is constantly utilizing local, state and federal programs and guidance regarding long term planning	Local Planning and Regulations	Medium	Existing	Water Department function within City ordnances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.	2028	Low	City's General Funds
c. Working with MARC, develop drought plans and water conservation programs.	2027	Ongoing	City is utilizing local programs and guidance and coordinates with MARC regarding water drought and conservation programs in local plans	Local Planning and Regulations	Medium	Existing	Water Department function within City ordnances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.	2028	Low	City's General Funds
3. Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.													
a. Develop and conduct public education and awareness programs on drought mitigation, drought response and water conservation.	2027	Ongoing	City Water Department partners with the Water Pollution Control Division to conduct local public educational programs. This includes supplying literature and conducting presentations at local schools and civic events.	Education and Awareness Programs	Medium	New	Water Department function within City ordnances and codes	City's Water Department	On-going	Low cost mechanism to support drought response.	2027	Low	City's General Funds
4. Encourage water conservation efforts by commercial, industrial and private water users.													
a. Develop and implement a program to encourage voluntary water conservation.	2027	Ongoing	City works partners the Water Pollution Control Division to conduct local public educational programs. This includes supplying literature and conducting presentations at local schools and civic events.	Education and Awareness Programs	Medium	Existing	Water Department and Water Pollution Control Department function within City ordnances and codes	City's Water Department	On-going	Low cost mechanism to increase support water conservation measures.	2027	Low	City's General Funds
5. Encourage improvements to water system infrastructures to reduce vulnerability to drought and meet water use demands.													
a. Budget for infrastructure improvements to municipal water systems.	2027	Ongoing	The City has implemented a Leak detection system to determine if underground water pipe infrastructures are leaking water.	Local Planning and Regulations	High	Existing	Water Department and Water Pollution Control Department function within City ordnances and codes	City's Water Department	On-going	Targeted and phased improvements will improve efficiency and reduce future recovery and replacement costs.	2027	High	City's General Funds
c. Identify and apply for state and federal grants to improve water treatment plants, transmission systems, water mains and related infrastructure.	20127	Ongoing	The City consistently continues to apply for State and Federal grants for water system infrastructure improvements	Structure and Infrastructure Projects (BRIC)	High	New	Water Department and Water Pollution Control Department function within City ordnances and codes	City's Water Department	On-going	High cost mechanism to implement but greatly increases water conservation measures.	2027	High	City's General Fund, Grants, or other future sources
Extreme Temperatures													
1. Ensure local governments and human services agencies are aware of air conditioned facilities across the Kansas City metropolitan area that can be used as shelters in the event of a heat wave.													
a. Partner with MARC, local public health agencies, emergency management agencies, the American Red Cross, Salvation Army and other stakeholders to inventory public, private and non-profit facilities that are air conditioned and can be used as "heat emergency shelters" in the event of a heat wave.	2025	Ongoing	The City of Independence works with several local and regional stakeholders to ensure the City has numerous "Cooling Centers" open to the public during times of severe heat waves.	Local Planning and Regulations Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to identify mitigation strategies for populations vulnerable to heat waves.	2026	Low	City's General Fund

b. Retrofit otherwise suitable existing facilities with air conditioning systems and designate them as shelters for use during heat waves.	2025	Ongoing	Currently the City has numerous shelter sites, but efforts to continue increasing shelter facilities through the City's educational preparedness programs and Faith Based Initiative are ongoing. Many of these sites have air-conditioning but efforts continue to try and retrofit those shelters that are not climate controlled.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness utilizes the Safe Shelter Partnership for cooling centers in addition to the Salvation Army and United Way	Emergency Preparedness Division	Ongoing	Medium cost mechanism to assure populations vulnerable to heat waves are protected.	2026	Medium	City's General Fund, Grants, or other future sources
2. Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.													
a. Identify at-risk, low income and elderly residents and develop a database and map (or GIS layers) of their places of residence.	2025	Ongoing	The Emergency Preparedness Division is currently exploring ways to get at-risk populations into a GIS database. One option is to use a Mass Notification service.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Medium cost method to identify at-risk populations to prevent injury of death	Local Planning and Regulations. Education and Awareness Programs	Medium	City's General Fund, Grants, or other future sources
b. Partner with community service organizations and area businesses to provide air conditioners and/or fans to at-risk groups, low income residents and the elderly.	2025	Ongoing	The City's Emergency Preparedness Division has numerous City facilities that are air conditioned and available to residents during times of severe heat conditions. The City also coordinates with the United Ways regional 211 information system to help residents identify local "Cooling Centers"	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to support resiliency for vulnerable populations during heat waves.	Local Planning and Regulations. Education and Awareness Programs	Low	City's General Fund
3. Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.													
a. Develop local heat emergency plans or heat wave annexes to local emergency operations plans.	2010	Ongoing	All weather emergency procedures and plans are continually being updated.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division function within City ordnances and codes	Emergency Preparedness Division	Ongoing	Low cost mechanism to increase public safety.	Local Planning and Regulations. Education and Awareness Programs	Low	EMPG and City's General Fund
c. Partner with public safety agencies, local public health agencies and community groups to develop a program to regularly check on elderly, low income and at-risk people in the community during heat waves.	2010	Ongoing	The City has a severe heat plan that coordinates with public and private agencies to check on at-risk populations in the City. This is an on-going program continually identifying additional partners such as CERT, VIPS and faith based organizations.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	Local Planning and Regulations. Education and Awareness Programs	Low	City's General Funds
d. Work with community groups to sponsor a program to encourage people to think of those who require special assistance (this effort can be incorporated into Neighborhood Watch, CERT or similar programs).	2010	Ongoing	The City has a severe heat plan that coordinates with public and private agencies to check on at-risk populations in the City. This is an on-going program continually identifying additional partners such as CERT, VIPS and faith based organizations.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	Local Planning and Regulations. Education and Awareness Programs	Low	City's General Funds

4. Enhance public awareness of the hazards associated with heat waves, precautionary measures and area heat wave mitigation and preparedness activities.													
a. Collect and disseminate public education materials that address heat wave safety, preparedness and mitigation activities.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards heat waves can cause. This year the City also adopted and implemented the regional 'Heat Health Warning System" which will bring advanced notification and education to citizens regarding the forecasting of high heat conditions.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds
b. Provide vulnerable populations with public education materials that address heat wave safety, preparedness and mitigation activities.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards heat waves can cause. This year the City also adopted and implemented the regional 'Heat Health Warning System" which will bring advanced notification and education to citizens regarding the forecasting of high heat conditions.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds

c. Work with the media to publish special newspaper sections or conduct periodic broadcasts with emergency information on extreme heat.	2025	Ongoing	This year the City also adopted and implemented the regional 'Heat Health Warning System" which will bring advanced notification and education to citizens regarding the forecasting of high heat conditions. This program is designed to communicate standardized warning guidelines and conditions to the public through partnering organizations such as the NWS and local new media outlets. The City's Emergency Preparedness Division also participates with the regional Integrated Warning Team. This group is task to bring all organizations with responsibilities regarding warning the public about severe weather events together to develop more resilient and effective warnings.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Office of Emergency Management	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds
d. Develop and conduct a public education and awareness campaign on properly weather stripping homes.	2025	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards heat waves can cause. The educational program also includes information about making residents homes more energy efficient. The City's power and Light Department also has an educational program to help residents improve their homes energy efficiency and will go to residents homes to survey the structure.	Local Planning and Regulations. Education and Awareness Programs	High	Existing	Emergency Preparedness Division, City Health Department function within City ordnances and codes	Emergency Preparedness Division and Power and Light Department	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds
Dam Failures													
2. Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.													
a. Work with MDNR and USACE to conduct a public education campaign to inform citizens living near the inundation pathways of dams of the need to be familiar with the emergency action plans for these dams.	2026	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division, within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds

b. Collect and disseminate public education materials that address dam safety, preparedness and mitigation activities.	2026	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division, within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds
c. Provide property owners in or near the inundation pathways of dams with information on dam safety, preparedness and mitigation activities.	2026	Ongoing	The City's Emergency Preparedness Division has an on-going program to educate the public about "All hazards" preparedness and safety. This program includes standardized educational materials that address the hazards of dam failures. The City has two potential large dams that would affect our population should it fail.	Education and Awareness Programs	High	Existing	Emergency Preparedness Division, within City ordnances and codes	Emergency Preparedness Division	On-going	Low cost mechanism to increase public safety.	2026	Low	City's General Funds
Levee Failure													
1. Improve response planning for Levee Failure													
Work with the water department to ensure the levees surrounding the water plant are adequate and properly maintained.	2028	Ongoing	Consult with Municipal Services, Army Corps of Engineers Levee Support Program, FEMA and State DNR to develop a plan to address maintaining and enhancing levees surrounding the water plant	Local Plans and Regulations. Structure and Infrastructure Projects (BRIC)	High	New & Existing	EOP	Emergency Preparedness Division	Ongoing	Low cost mechanism to increase public safety.	2027	Low	City's General Funds

Kansas City 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Ensure whole community resiliency to migate the effects of tornados.										
Conduct high wind refuge inspections for businesses	2015	Ongoing	Trained personnel conduct inspections upon request.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	General Fund
Increase tornado siren coverage to keep up with KCMO expansion and provide more early warning to help mitigate loss of life.	2025	New	Modified from previous plans.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Emergency Management	$41k per siren	General Fund and grants
Educate the whole community on how to mitigate the effects of Tornados through multiple methods.	2025	New	Modified from previous plans.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	EM budget
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2025	New	Current building codes address this issue. However, KCMO will adapt as new codes are adopted.	Local Plans and Regulations	Medium	Ongoing	unknown	Building Code Dept	Unknown	Unknown
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	Ongoing	As soon as this mitigation plan is complete, then the City's planning teams will examine what elements can be incorporated.	Local Plans and Regulations	Medium	Undetermined	unknown	City Planning Dept.	Unknown	Unknown
Improve Kansas City, MO's, ability to mitigate damage to City infrastructure from tornados.										
Increase/reinforce refuge areas to mitigate loss of life from tornados	2025	New	This was taken from various actions in the previous plans.	Local Plans and Regulations, Education and Awareness Programs	Medium	Ongoing	unknown	Aviation; City Planning and Development Dept, Building Code Div; Emergency Management;	Unknown	grants
Research and implement enhanced operational methods, hardware, systems, and technology to mitigate cyber disruption from the effects of tornados	2015	Ongoing	IT researches and implements current best practises against power surges and cyber intrusions.	Structure and Infrastructure Projects	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Improve Kansas City, MO's, ability to reponse to mitigate loss of life from tornados.										
Ensure timely warnings are delivered to the whole community through a variety of methods including mass notification.	2025	new	This was taken from various actions in the previous plans.	Education and Awareness Programs	High	Ongoing	unknown	City Communications, Emergency Management	Unknown	grants, general fund

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Ensure first responders are prepared to assist the whole community in the event of a tornado.	2015	Ongoing	PPE is continually provided; no funding exists at this time, but KCPD will continue to pursue.	Local Plans and Regulations, Education and Awareness Programs	Unspecified	Ongoing	unknown	Police Dept	Unknown	Unknown
Conduct training and provide information for personnel regarding the inherent dangers of and maintaining safety during a tornado	2025	Ongoing	Training for the whole community is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Research methods, training, and funding to improve Health Department's processes for controlling disease vectors prior to a tornado to mitigate disease spread resulting from tornadic activity.	2020	Ongoing	KCHD continues to research disease vector control protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Medium	Ongoing	unknown	Health Department	Unknown	Unknown
Floods										
Improve Kansas City, MO's, resiliency through mitigation of flooding and flood damage.										
Research and implement latest methods and lessons learned to mitigate flood damage to KCMO infrastructure.	2025	New	This was taken from various actions in the previous plans.	Structure and Infrastructure Projects	Medium	Ongoing	potentially millions	Emergency Management, Water Services	Unknown	general fund, grants
Upgrade and enhance EOC flood monitoring systems to mitgate loss of life from flooding.	2015	Ongoing	The system has been upgraded over the last 5 years. However, new technology means that this action will be ongoing.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Emergency Management	Unknown	General Fund
Ensure whole community resiliency to migate the effects of flooding and flood damage.										
Educate the whole community on how to mitigate the effects of Tornados through multiple methods.	2025	New	Revised from previous plans' actions.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Encourage the whole community to obtain flood insurance to improve resiliency.	2025	Ongoing	Revised from previous plans' actions.	Education and Awareness Programs	High	Ongoing	Reduces the burden of repair costs to home and business owners through the use of flood insurance funds.	Emergency Management, Planning Dept	Unknown	Water Services Dept., Office of Emergency Management
Improve Kansas City, MO's, ability to reponse to mitigate loss of life from floods.										

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Improve methods to warn of flooding or impending floods to mitigate loss of life.	2025	new	This was taken from various actions in the previous plans.	Education and Awareness Programs	High	Ongoing	unknown	City Communications, Emergency Management, Water Services Dept.	Unknown	grants, general fund
Research and enhance ability to prevent and track diseases borne from floods.	2025	New	This was modified from the previous plans' similar actions	Local Plans and Regulations	Medium	Ongoing	unknown	Health Dept.	Unknown	budget, grants
Conduct training and provide information for personnel regarding the inherent dangers of and maintaining safety during flooding	2025		Training for the whole community is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Ensure first responders are prepared to assist the whole community in the event of a tornado.	2025	New	This was taken from various actions in the previous plans.	Education and Awareness Programs	Medium	Ongoing	unknown	KCFD, KCPD	Unknown	budget, grants
Improve evacuation methods to ensure the whole community can be evacuated from area at risk of flooding.	2025	New	This is a new action.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Parks and Recreation	Unknown	Unknown
Heat										
Enhance Kansas City, MO's, resiliency through mitigating the effects of excessive or prolonged heat and drought.										
Research and implement best practices for building methods to prevent heat absorption and mitigate heat damage.	2015	Ongoing	Parks and Recreation provides training; implementing green roofs on certain new facilities.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Ganeral Services, Neighborhood Services, Parks and Recreation	Unknown	budget, grants
Utilize improved equipment to ensure network resiliency to heat, mitigating heat related damage.	2025	New	This is a new action.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan with respect to heat.	2020	Ongoing	KCMO's comprehensive plan is modified continually.	Local Plans and Regulations	Medium	Ongoing	unknown	Planning Dept	Unknown	budget, grants
Research and utilize alternative methods (such as landscaping) to mitigate the effects of heat and drought.	2025	New	This is modified from previous plans.	Natural Systems Protection	Low	Ongoing	unknown	Parks and Recreation	Unknown	budget, grants
Research, identify, and locate funding sources to implement water conservation technologies for new and existing public facilities.	2020	Ongoing	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	water services	Unknown	budget, grants
Improve the public and private sector's resiliency to the effects of excessive or prolonged heat and drought.										

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Obtain and distribute material and training for the whole community on the methods for mitigating injury from excessive heat.	2025	New	This action combines other actions from previous plans.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management, Health Dept.	Unknown	budget, grants
Include drought information in preparedness outreach and campaigns.	2015	Ongoing	WSD provides information on water conservation and other programs.	Education and Awareness Programs	Low	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Continue and improve programs to assist the whole community with cooling their dwellings		Ongoing	CDBG funding annually provides for water heaters, A/C units, and furnaces. More funding would increase the success of the program.	Local Plans and Regulations	Medium	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Develop techniques to mitigate the effects of fire due to drought and excessive heat through improved response.										
Enhance Kansas City, MO's, ability to provide alther cooling sources for the whole communicty.	2025	Ongoing	Finding ways to cool the whole community, especially vulnerable populations, is and ongoing challenge	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Emergency Management, Aviation, Parks and Rec	unknown	budget, grants
Research and implement methods, training, and funding to improve Health Department's inspection of food potentially tainted from exposure to excessive heat.	2020	Ongoing	KCHD continues to research food inspection and contamination protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	High	Undetermined	unknown	health dept	Unknown	budget, grants
Severe Thunderstorms										
Enhance Kansas City, MO's, resiliency through mitigating the effects of severe thunderstorms										
Adopt current edition of building codes to address structural and architectural issues related to severe thunderstorms	2015	Ongoing	Current building codes address this issue. However, KCMO will adapt as new codes are adopted.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Planning Dept	Unknown	budget, grants
Identify funding sources to provide protection to public facilities from high winds, lightning and hail to mitigate any damage that might be caused.	2015	Ongoing	KCMO is continually searching for funding sources.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	General Services	Unknown	budget, grants
Improve the public and private sector's resiliency to the effects of thunderstorms.										
Provide education and information on how the whole community can protect itself and mitigate damage from severe thunderstorms.	2025	New	This is a modified action from previkous plans.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Improve Kansas City, MO's, ability to reponse to mitigate loss of life from severe thunderstorms.										

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Enhance and improve mass notification to the whole community warning of approaching severe thunberstorms to mitigate loss of life.	2025	New	This is a new action but modified and updated from previous plans.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	budget, grants
Work with Regional National Weather Service to provide Storm Spotter training to officers.	2015	Ongoing	Training is provided with each new class.	Education and Awareness Programs	Medium	Ongoing	unknown	Police Dept	Unknown	Unknown
Severe Winter Weather										
Enhance Kansas City, MO's, resiliency through mitigating the effects of severe winter weather.										
Identify and conduct training for personnel to respond to winter related issues such as snow and ice removal	2015	Ongoing	Personnel receive briefings and trainings to prevent or reduce the effects of weather related injuries.	Education and Awareness Programs	High	Ongoing	unknown	Public Works	Unknown	budget, grants
Identify and obtain back up power sources to mitigate the effects long term power outage from ice/snow.	2025	New	This action is modified from previous actions.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Aviation, Emergency Management, General Services, KCFD, KCPD, Water Services Dept.	Unknown	budget, grants
Research and develop the latest practices for mitigating snow and ice damage and delays for operations.	2025	New	This is a new action but modified and updated from previous plans.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Aviation Dept., Public Works	Unknown	budget, grants
Research and implement cold resistant equipment to mitigate severe winter weather damage to critical infrastructure.	2025	New	This is a new action but modified and updated from previous plans.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Emergency Management, Public Works, Water Services	Unknown	budget, grants
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	Ongoing	Continue to incorporate baset practices into the KCMO Comprehensive Plan as it is revised.	Local Plans and Regulations	Medium	Ongoing	unknown	Planning Dept	Unknown	budget, grants
Research mechanisms and funding to increase building resiliency to damage from winter weather elements such as extreme cold, snow, and ice.	2020	Ongoing	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium	Undetermined	unknown	public works	Unknown	budget, grants
Improve the public and private sector's resiliency to the effects of severe winter weather.										
Identify funding sources to provide materials and labor to assist at-risk, low income, and elderly residents with improving their residence's resiliency to cold weather.	2025	New	Modified from previous plans.	Education and Awareness Programs	Medium	Ongoing	unknown	Health Dept.	Unknown	budget, grants

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Provide education and information on how the whole community can protect itself and mitigate damage from severe winter weather.	2025	New	Modified from previous plans.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management, Health Department	Unknown	budget, grants
Improve Kansas City, MO's, ability to reponse to mitigate loss of life from winter weather and extreme cold.										
Expand capacity to provide warming centers to mitigate loss of life from	2025	New	This is a new action but modified and updated from previous plans.	Structure and Infrastructure Projects	High	Ongoing	unknown	Housing Dept., Emergency Management	Unknown	budget, grants

2025 Lee's Summit Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of approved materials that reduce the damaging effects of tornadoes and high wind events.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2025	New	Considering adoption of updated buidling codes	Local Plans and Regulations	Medium	Every three years	A guide for the safe construction of the built environment.	development dept	2500	Local Budgeted Funds and Staff Time
Consider adopting ordinances or regulations requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2015	Ongoing		Local Plans and Regulations	Low	Ongoing	Provide emergency shelter for the occupants of structures without basements.	development dept	Low	Local Budgeted Funds and Staff Time
Provide education/updates to designers, builders, residents on changes to newly adopted codes related to minimizing storm damage	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Medium	development dept	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoesand high wind.	2015	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Provide emergency shelter for the occupants of structures without basements.	public works	High	General Fund/HMGP, BRIC
Encourage the construction of safe rooms and tornado shelters in public and private buildings.										
Work with chambers of commerce, school districts, corporations, homeowners, developers etc. to promote benefits ofsafe rooms and community shelters.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Medium	emergency management	Low	Private/Grants for Public Projects
Evaluate warning systems in the City.										
Utilize ongoing communication studies and surveys to determine how residents receive severe weather warnings. Determine what is the most effective method(s) for the cost.	2020	Ongoing	Continued monitoring and evaluation of notification and warning systems available in our community to include Nixle, social media, NOAA weather radios, and outdoor warning systems.	Education and Awareness Programs	Medium	Ongoing	Find cost effective warning systems to enhance mass notification.	emergency management	TBD	General Fund/Public Grants
Increase public awareness of severe weather notification systems available within the City.										

Increase public awareness of severe weather notification systems available within the City through social media, school Safety Education Program, civic presentations, and printed and electronic publications.	2020	Ongoing	Public education and community outreach occurs using variety of mechanisms such as the public education programs delivered in the schools, social medial using systems like hootsuite, and in formal presentations. Electronic and printed materials are available in website and in city facilities.	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	TBD	General Fund
Update the Local Emergency Operating Plan										
Update Local Emergency Operation Plan to currently accepted framework.	2020	Ongoing	EOP is currently under revision transitioning framework from functional annexes to Emergency Support Functions	Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	TBD	General Fund
Floods										
Continue to integrate flood mitigation strategies with projects and activities designed to protect , restore or enhance ecosystems and the environment and create recreational opportunities for the community.										
In concert with existing comprehensive and land use plans, acquire flood-prone property, as deemed reasonable and financially responsible, for use as open space or park land.	2015	Ongoing		Natural Systems Protection	Medium	Ongoing	Medium	development dept and public works department	High	General Fund
Require storm water studies to determine the need for detention basins, small lakes and greenways or riparian corridorsin areas of new development to channel and catch storm water, thereby reducing the likelihood offlooding.	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Minimizes the impact of flooding downstream from new development	development dept	Medium	Private

2025 Levasy Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Medium	Adopted 2009 code in 2011	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Local Plans and Regulations	Medium	2010	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
Improve existing and future storm sirens										
Purchase new/update existing storm sirens.	2025	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Continued functionality of outdoor warning systems.	emergency management	Medium	HMGP, BRIC
Increase citizen disaster preparedness.										
Provide public education materials.	2025	Ongoing		Education and	High	Ongoing	Citizens better prepared	emergency management	Low	Local Budgeted
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2025	Ongoing		Education and	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted
Floods										
Discourage new development in floodplains and flood-prone areas.										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2025	Completed.		Local Plans and Regulations	High	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time

2025 Oak Grove Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2020	Ongoing	Continuous project.	Local Plans and Regulations	Medium	Continuous project	Medium	Planning	Low	General Revenue
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2020	Ongoing		Structure and Infrastructure Projects	Medium	Continuous project	Medium	Planning	High	General Revenue; EMPG
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2020	Ongoing	Continuous project.	Local Plans and Regulations	Medium	Continuous project	Medium	Planning	Low	General Revenue; EMPG
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2020	Ongoing	Continuous project	Education and Awareness Programs	Medium	Continuous project	Updated building codes and Uniform Development Code since 2010. No mechanism possible to quantify refults.	Emergency Mgt.	Low	General Revenue; EMPG
Encourage construction of community tornado shelters in office complexes, factories, apartment complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regulations requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2020	Ongoing	Continuous project	Local Plans and Regulations	Medium	Continuous project	No enabling law so far. Efforts to promote legislation continue.	Planning	Low	General Revenue; EMPG
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2020	Ongoing	Continuous project	Education and Awareness Programs	Medium	Continuous project	Shelter completed at R-VI School District in Fall 2014; no incidents requiring its use at the time of this survey 12-2014	Emergency Mgt.	Low	FEMA Shelter Grant
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Require that utility lines in new construction be underground.	2020	Ongoing	Continuous project.	Local Plans and Regulations	High	Continuous project	Medium	Planning	None to local government.	Utility Providers
Urge electric utilities to anchor or strengthen above-ground transmission lines, poles and similar structures.	2020	Undetermined	Continuous project.	Structure and Infrastructure Projects	Medium	Continuous project	No mechanism possible to quantify results. Numerous poles and infrastructure have been replaced during the last five years., especially during the two Broadway (F Highway) widening projects and at other locations.	Planning	High	Electric Utilities
Urge utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Undetermined	Continuous project.	Structure and Infrastructure Projects	Medium	Continuous project	Medium	Planning	None to local government	Electric utilities.
Ensure public facilities have shelters and emergency plans to accommodate staff and visitors during tornadoes/ natural hazards.										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing	Continuous project	Local Plans and Regulations	Medium	Ongoing	Safe rooms constructed at new Sni Valley Fire Station 1 and as the new R-VI school district Performing Arts Center.	Planning	Low	General Revenue and FEMA Shelter Grants

In facilities with no designated shelters, assist the facility to identify best possible shelter spaces and make plans for severe weather emergencies.	2020	Ongoing	Continuous project	Education and Awareness Programs	High	Continuous project	Medium	Planning	Low	General Revenue, EMPG
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	Ongoing	Continuous project	Structure and Infrastructure Projects	High	Continuous project	Unknown, no tornadoes have caused damage in the area. Some persons were sheltered in the new Fire Station shelter in 2011 during a tornado warning, but the tornado did not affect Oak Grove and caused no damage.	Planning	High	General Revenue
Increase local ability to provide warning and information about severe weather through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2020	Undetermined	A continuous program	Education and Awareness Programs	Medium	Continuous program	Medium	Emergency Mgt.	Low	Undetermined; General Revenue
Increase local resilience to electric power loss especially in critical systems and infrastructure.										
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials and perform various educational activities on the benefits of safe rooms.	2020	Ongoing	Continuous project	Education and Awareness Programs	High	Continuous project	Unknown, since there have been no tornadoes affecting Oak Grove	Emergency Mgt.	Low	General Revenue, EMPG
Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.										
Use social media, poster presentations, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	2020	Undetermined	Continuous project.	Education and Awareness Programs	Medium	Continuous project.	Medium	Emergency Mgt.	Low	General revenue and EMPG
Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, radar data, and other online data sources and local weather observations.										
Research information sources for severe weather information, including information from radar, satellite, spotters, observation stations, forecasts, and other jurisdictions and seek ways to evaluate such information in a timely manner.	2020	Undetermined	Continuous project	Local Plans and Regulations	Medium	Continuous Project	Medium	Emergency Mgt.	Low	Unknown
Floods										
Discourage new development in floodplains and flood-prone areas.										
Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2020	Undetermined		Local Plans and Regulations	Medium	Continuous Project	Medium	Planning	Dependent on project	Fees
Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2020	Undetermined	Continuous project	Education and Awareness Programs	Medium	Ongoing	No mechanism possible to quantify results. No mechanism exists for local government to get information on numbers of flood insurance policy holders or loss claims.	Planning	Low	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing		Education and Awareness Programs	Low	Ongoing	No mechanism possible to quantify results. Numerous brochures and information disseminated through electronic and print media.	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time

Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2020	Undetermined	Continuous project	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Ongoing	Few repetitive loss structures are present in our jurisdictions.	Structure and Infrastructure Projects	Low	Continuous Project	Medium	floodplain manager	High	HMGP, BRIC
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2030	Ongoing	Dependent on Federal grant oppotunities.	Structure and Infrastructure Projects	Medium	Continuous Project	Medium	floodplain manager	High	HMGP, BRIC
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing	Depends on flood indents to incentivize property owners to take action.	Education and Awareness Programs	Medium	Continuous Project	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.		Ongoing	Continuous, unending process.	Structure and Infrastructure Projects	High	Continuous Project	No repetitive loss properties have been identified from stream or river flooding.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2030	Ongoing	Depends on importance attached by USACE and NWS	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2030	Undetermined	Continuous project	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	2030	Undetermined	A continuous process	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Undetermined		Local Plans and Regulations	Medium	Continuous Project	Medium	emergency management	Low	Emergency Management Performance Grant
Increase local resilience to electric power loss especially in critical systems and infrastructure.										
Obtain local resources for back-up electrical supply for critical infrastructure and portable electrical supply assets for other needs during electrical power outages.	2025	Ongoing	Depends on the location of funding sources for obtaining equipment.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	High	HMGP, BRIC
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing	Opportunities based on integration with other projects.	Structure and Infrastructure Projects	Medium	Continuous Project; no foreseeable end.	Medium	Planning	High	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2030	Ongoing	Ongoing part of the plan process for new construction and property development projects.	Structure and Infrastructure Projects	High	Continuous process.	No mechanism possible to quantify results. Numerous storm water projects have been conducted since 2009 as part of construction of the Broadway (F Highway) Widening Project, Oaks of Edgewood development, and numerous projects rebuilding existing infrastr	Planning	Unknown; dependent on project, usually absorbed by the developer.	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed	2010	Ongoing		Local Plans and Regulations	High	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time

Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	Ongoing	Dependent on opportunity and integrating with other projects.	Structure and Infrastructure Projects	Low	Continuous Project; no foreseeable end.	Medium	Planning	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	A large tract of city-owned property purchased a part of the Sewer Treatment Plant construction project has been designated as green space, and initially will become practice soccer fields.	Planning	Low	Local Budgeted Funds and Staff Time
Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2020	Ongoing	Based on opportunities.	Structure and Infrastructure Projects	Low	Ongoing	Medium	Planning	Determined by project.	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Undetermined	Continuous project	Local Plans and Regulations	Medium	Continuous Project; no foreseeable end.	Medium	floodplain manager	Low	National; Flood Insurance Program
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2020	Ongoing		Structure and Infrastructure Projects	High	Continuous Project; no foreseeable end.	Medium	Planning	High	HMGP, BRIC
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2020	Ongoing		Structure and Infrastructure Projects	Medium	Continuous project	Medium	Planning	Dependent on project	Dependent on project; probably electrical utility user fees.
Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2020	Ongoing		Structure and Infrastructure Projects	High	Continuous Project; no foreseeable end.	Has been accomplished in several projects through project design and site elevation. No mechanism possible to quantify monetary results.	Planning	Unknown; dependent on project.	Missouri DNR Revolving Wastewater Fund and Wastewater and Water User Fees.
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2020	Ongoing		Structure and Infrastructure Projects	High	Continuous Project; no foreseeable end.	Medium	floodplain manager	High	HMGP, BRIC
SInce most historic flood damage in Oak Grove has been caused by Infiltration and Inflow (I&I) through the sewer system, reduce (I&I) in the sewer system.										
Conduct testing of the sewer system to identify entry points for floodwater into sewer systems and illegal connections into the sewer system such as downspouts, sump pumps, and floor drains.	2025	Ongoing	A continuing project.	Structure and Infrastructure Projects	Medium	Continuous project	Medium	Planning	Low	General Revenue
Require in local building codes that sewer backflow valves be installed in new construction or major remodeling and strongly recommend their installation in existing construction.	2025	Ongoing	This is proposed in the building code update of late 2024 and is expected to be approved by the Board of Aldermen.	Local Plans and Regulations	High	Early 2025	Medium	Planning	No cost to local government	Developers, builders, and property owners.
Severe Thunderstorms										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Encourage construction of community tornado shelters in office complexes, factories, apartment complexes, schools, mobile home parks, stadiums, and other large population congregation centers.										
Increase local resilience to electric power loss especially in critical systems and infrastructure.										
Obtain local resources for back-up electrical supply for critical infrastructure and portable electrical supply assets for other needs during electrical power outages.	2025	Ongoing	Depends on the location of funding sources for obtaining equipment.	Structure and Infrastructure Projects	Medium	Continuous project	Medium	emergency management	High	HMGP, BRIC

Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.										
Use social media, poster presentations, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	2020	Ongoing	Continuous project	Education and Awareness Programs	High	Continuous project	Medium	emergency management	Low	General revenue, EMPG
Increase local ability to provide warning and information about severe weather through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.										
Increase local ability to provide warning and information about severe weather through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.	2020	Ongoing	Continuous project	Structure and Infrastructure Projects	Medium	Continuous project	Medium	emergency management	Low	General revenue, EMPG, HMGP
Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, radar data, and other online data sources and local weather observations.										
Obtain enhanced weather information systems and incorporate them into operational plans	2020	Ongoing	Continuous project.	Structure and Infrastructure Projects	High	Continuous project	Medium	emergency management	Low	General revenue, EMPG, HMGP
Research new or enhanced sources of information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	2020	Ongoing	Continuous project	Structure and Infrastructure Projects	High	Continuous project	Medium	emergency management	Low	General revenue, EMPG, HMGP
Severe Winter Weather										
Increase local resilience to electric power loss especially in critical systems and infrastructure.										
Obtain local resources for back-up electrical supply for critical infrastructure and portable electrical supply assets for other needs during electrical power outages.	2025	Ongoing	Depends on the location of funding sources for obtaining equipment.	Structure and Infrastructure Projects	Medium	Continuous project	Medium	emergency management	High	HMGP, BRIC
Increase local ability to provide warning and information about winter weather emergencies through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.										
Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, radar data, and other online data sources and local weather observations.										
Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for warming centers and shelters to be available during times of excessive cold and severe winter weather.										
Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events.										
Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events to provide a more scientific measurement of heat stress on persons outdoors.	2020	Ongoing	Additional information sources and equipment needed.	Local Plans and Regulations	High	Continuous project	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Incorporate wet bulb global temperature measurements into emergency plans and reference materials.	2025	Ongoing		Local Plans and Regulations	Medium	2025	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Extreme Temperatures										
Increase local ability to provide warning and information about heat emergencies through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2020	Ongoing	Continuous project.	Structure and Infrastructure Projects	High	Continuous project	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Increase local resilience to electric power loss especially in critical systems and infrastructure.										
Obtain local resources for back-up electrical supply for critical infrastructure and portable electrical supply assets for other needs during electrical power outages.	2025	Ongoing	Depends on the location of funding sources for obtaining equipment.	Structure and Infrastructure Projects	Medium	Continuous project	Medium	emergency management	High	HMGP, BRIC
Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, radar data, and other online data sources and local weather observations.										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2020	Ongoing	Continuous project.	Education and Awareness Programs	High	Continuous project	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for cooling centers to be available during times of excessive heat.										
Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for cooling centers to be available during times of excessive heat.	2020	Ongoing	Continuous project.	Local Plans and Regulations	High	Continuous project	Medium	emergency management	Low	Local Budgeted Funds and Staff Time

2025 City of Raytown, MO Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Maintain continuity of municipal operations and services during power outages.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Promote public situational awareness and safety steps regarding tornado threats.										
Encourage the use of mass notification systems, such as Nixle, for severe weather threats.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Regularly test, monitor, and maintain outdoor tornado warning sirens.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Floods										
Maintain continuity of municipal operations and services during power outages.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Reduce risks from stormwater runoff through emergency notification.										
Encourage the use of mass notification systems, including Nixle, for severe weather threats.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Promote public situational awareness and safety steps regarding flash flooding threats.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Reduce risks from stormwater runoff through infrastructure improvements.										
Consider detention basins and other stormwater management tools in areas of new development to channel and catch stormwater, thereby reducing the likelihood of flooding.	2025	New, reviewed in 2025		Local Plans and Regulations	High	Ongoing	Medium	Planning	High	HMGP, BRIC
Evaluate and consider the adoption of updated regional stormwater design standards.	2025	New, reviewed in 2025		Local Plans and Regulations	High	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Maintain continuity of municipal operations and services during power outages.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Promote public situational awareness and safety steps regarding severe thunderstorm threats.										

Encourage the use of mass notification systems, such as Nixle, for severe weather threats.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Regularly test, monitor, and maintain outdoor tornado warning sirens.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Encourage the use of mass notification systems, such as Nixle, for severe winter weather threats.										
Enact and broadcast emergency snow route information as necessary.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Identify and respond to hazardous roadway conditions to reduce risks from severe winter weather.										
Prepare and apply road treatment materials necessary to reduce or eliminate ice and snow on roadways and improve road conditions.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Public Works	Low	Local Budgeted Funds and Staff Time
Maintain continuity of municipal operations and services during power outages.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Extreme Heat										
Encourage the use of mass notification systems, such as Nixle, for severe weather threats.										
Use Nixle and social media to share heat-related emergency information.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Maintain continuity of municipal operations and services during power outages.										
Regularly test, monitor, and maintain backup power systems for municipal facilities.	2025	New, reviewed in 2025		Structure and Infrastructure Projects	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Partner with community stakeholders to identify air-conditioned public, private, and nonprofit facilities that can be used as “heat emergency shelters" during a heat wave.										
Share "heat emergency shelter" information as needed.	2025	New, reviewed in 2025		Education and Awareness Programs	High	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time

2025 SNI-VALLEY FIRE PROTECTION DISTRICT MITIGATION STRATEGY												
HAZARD	**GOAL**	**ACTION**	**ACTION**	**PLAN YEAR**	**STATUS**	**EXPLANATION OF STATUS**	**ACTIVITY TYPE**	**PRIORITY**	**COMPLETION DATE**	**Primary Agency Responsible for Implementation/ Administration**	**ESTIMATED COST**	**FUNDING SOURCE**
TORNADO AND SEVERE THUNDERSTORM	Goal: Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.	Action: Use social media, poster presentations, websites speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	Use social media, press releases, poster presentations,websites, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Increase public awareness and understanding the benefits of "safe rooms."	Action: Develop, distribute informational materials and perform various educational activities on the benefits of safe rooms.	Develop, distribute informational materials and perform various educational activities on the benefits of safe rooms.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Ensure public facilities have shelters and emergency plans to accommodate staff and visitors during tornadoes/ natural hazards.	Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	Develop, distribute informational materials and perform various educational activities on the benefits of safe rooms.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	Medium	Continuous Project	Fire Protection District	Low	General Revenue, FEMA Shelter Grant, HMGP
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	Medium	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Ensure public facilities have shelters and emergency plans to accommodate staff and visitors during tornadoes/ natural hazards.	Action: In facilities with no designated shelters, assist the facility to identify best possible shelter spaces and make plans for severe weather emergencies.	In facilities with no designated shelters, assist the facility to identify best possible shelter spaces and make plans for severe weather emergencies.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Encourage construction of community tornado shelters in office complexes, factories, apartment complexes, schools mobile home parks, stadiums, and other large population congregation centers.	Action: Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	Medium	Continuous Project	Fire Protection District	Low	General Revenue, FEMA Shelter Grant, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Consider adopting ordinances or regulations requiring the construction of tornado shelters in new buildings where people live, work or congregate.	Consider adopting ordinances or regulations requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	Medium	Continuous Project	Fire Protection District	Low	General Revenue, EMPG

TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	Medium	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	High	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.	Action: Urge electric utilities to anchor or strengthen above-ground transmission lines, poles and similar structures.	Urge electric utilities to anchor or strengthen above-ground transmission lines, poles and similar structures.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Medium	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Urge utility providers to replace existing above-ground utility lines with underground utility lines.	Urge utility providers to replace existing above-ground utility lines with underground utility lines.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Require that utility lines in new construction be underground.	Require that utility lines in new construction be underground.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Increase local ability to provide warning and information about severe weather through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.	Action: Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG

TORNADO AND SEVERE THUNDERSTORM	Ibid	Action: Research information sources for severe weather information, including information from radar, satellite, spotters, observation stations, forecasts, and other jurisdictions and seek ways to evaluate such information in a timely manner.	Research information sources for severe weather information, including information from radar, satellite, spotters, observation stations, forecasts, and other jurisdictions and seek ways to evaluate such information in a timely manner.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
TORNADO AND SEVERE THUNDERSTORM	Goal: Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure	Action: Install and maintain whole building backup electric power capability for local government infrastructure.	Install and maintain whole building backup electric power capability for local government infrastructure.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Medium	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
FLOODS	Goal: Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.	Action: Work with owners of repetitive flood loss properties and the respective counties, to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options. Note: The Fire Protection District has no direct building code or flood insurance authority in Jackson County and only building code in Lafayette County.	Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Ibid	Action: With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Ibid	Action: Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented.	Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG, HMPG

FLOODS	Goal: Improve flood hazard assessments and flood mapping.	Action: Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Ibid	Action: Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Goal: Enhance public awareness and education efforts related to flooding.	Action: Encourage home owners and businesses to purchase flood insurance.	Encourage home owners and businesses to purchase flood insurance.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Ibid	Action: Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Ibid	Action: Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Goal: Participate in, and ensure compliance with, flood mitigation and floodplain management programs.	Action: Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG
FLOODS	Goal: Implement or improve flood warning systems.	Action: Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG, HM, NWS, USACE

FLOODS	Ibid	Action: Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG, HM, NWS, USACE
FLOODS	Ibid	Action: Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue, EMPG, HM, NWS, USACE
FLOODS	Goal: Plan for flash flooding from upstream dam failure.	Action: Conduct dam failure inundation studies using Dam Emergency Plans available from Missouri Department of Natural Resources	Conduct dam failure inundation studies using Dam Emergency Plans available from Missouri Department of Natural Resources	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Medium	General Revenue, EMPG
SEVERE WINTER WEATHER	Goal: Increase local ability to provide warning and information about winter weather emergencies through NOAA All Hazards Radio, Outdoor Warning Systems, Indoor Communications, Social Media, IPAWS and other, as yet undetermined technologies.	Action: Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
SEVERE WINTER WEATHER	Goal: Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	Action: Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations including pavement temperature readings.	Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations including pavement temperature readings.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
SEVERE WINTER WEATHER	Goal: Increase public awareness of the hazards and safety actions for severe winter weather through public education.	Action: Use social media, press releases, poster presentations,websites, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	Use social media, press releases, poster presentations,websites, speaking opportunities, and other means as available to educate the public about individual, family, organization, and community preparedness relating to tornadoes and severe storms.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG

SEVERE WINTER WEATHER	Goal: Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure	Action: Install and maintain whole building backup electric power capability for local government infrastructure.	Install and maintain whole building backup and portable electric power capability for local government infrastructure.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Medium	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
SEVERE WINTER WEATHER	Goal: Increase the capability to shelter persons stranded by closing of Interstate Highwaysdue the severe winter weather	Action: Install and maintain whole building backup electric power capability for local government government buildings, suitable as shelters	Install and maintain whole building backup electric power and portable electric power capability for local government government buildings, suitable as shelters	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Medium	General Revenue, HMGP
HEAT	Goal: Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for cooling centers to be available during times of excessive heat.	Action: Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for cooling centers to be available during times of excessive heat.	Work with venues in the City of Oak Grove and Sni Valley Fire Protection District to plan for cooling centers to be available during times of excessive heat.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
HEAT	Goal: Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events.	Action: Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events to provide a more scientific measurement of heat stress on persons outdoors.	Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events to provide a more scientific measurement of heat stress on persons outdoors.	2025-2030	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
HEAT	Goal: Increase the ability to gather information on severe weather emergencies through technologies such as NWS Chat, NWS EDD, radar data, and other online data sources and local weather observations.	Action: Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and and other emergency information technologies.	2025-2030	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project	Fire Protection District	Low	General Revenue and EMPG
HEAT	Goal: Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure	Action: Install and maintain whole building backup electric power capability for local government infrastructure.	Install and maintain whole building backup and portable electric power capability for local government infrastructure.	2025-2030	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project	Fire Protection District	Medium	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP

2025 Platte County Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Work to continue to get emergency weather radios available to underserved populations.										
Request monies for a stock of weather radios to handout to elderly and underserved populations in Platte County.	2025	New	Unknown if there are any funds from MARC for HAZMIT and radio program	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Management	Medium	HMGP, BRIC
Floods										
Work to continue to get emergency weather radios available to underserved populations.										
Request monies for a stock of weather radios to handout to elderly and underserved populations in Platte County.	2025	New	Unknown if there is any money for radios	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Management	Medium	HMGP, BRIC
Severe Thunderstorms										
Work to continue to get emergency weather radios available to underserved populations.										
Request monies for a stock of weather radios to handout to elderly and underserved populations in Platte County.	2025	New	Unknown if there is any money for radios	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Management	Medium	HMGP, BRIC
Severe Winter Weather										
Work to continue to get emergency weather radios available to underserved populations.										
Request monies for a stock of weather radios to handout to elderly and underserved populations in Platte County.	2025	New	Unknown if there is any money for radios	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Management	Medium	HMGP, BRIC
Extreme Temperatures										
Work to continue to get emergency weather radios available to underserved populations.										
Request monies for a stock of weather radios to handout to elderly and underserved populations in Platte County.	2025	New	Unknown if there is any money for radios	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Management	Medium	HMGP, BRIC
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing	Currently the county is considering the adoption of safe rooms to the Planning and Zoning ordinance. The county intends on adopting the 2018 version of the International Codes by the end of 2019	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing	Currently the county is considering the adoption of safe rooms to the Planning and Zoning ordinance The county intends on adopting the 2018 version of the International Codes by the end of 2019	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time

Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing	Currently the county is considering the adoption of safe rooms to the Planning and Zoning ordinance. The county is currently in the process of adopting the 2018 International Codes which deals with new wind bracing and tie downs.	Education and Awareness Programs	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing	Currently the county is considering the adoption of safe rooms to the Planning and Zoning ordinance	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing	Currently the county is considering the adoption of safe rooms as part of the 2018 International code adoption.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Working with all but still a hard issue to sell especially to Schools.	Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	Emergency Mgt	Low	FEMA Grants
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing	Working with new construction and ongoing construction to make this happen. This option is available to home owners at their cost and hookup.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing	Currently being done by all.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	High	HMGP, BRIC
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	County buildings have signage for tornado drills at this time.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	Most county buildings are evaluated and suggestion made for staff and elected officials.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	High	HMGP, BRIC
Evaluate the county to continue to add more warning sirens in locations of the greatest need										
Add additional outdoor warning sirens.	2015	Ongoing	Working with developments to update and add. Developing an ordinance requiring new home development to install an outdoor siren.	Structure and Infrastructure Projects	Medium	Ongoing	Will improve alert/warnings coverage.	emergency management	21000	budget
Increase public awareness and understanding the benefits of "safe rooms."										

Develop, distribute informational materials on safe rooms.	2010	Ongoing	Materials are made available for the public and contractors to gather information.	Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Increase public safety alert and warning.										
Continue public education on the all hazard weather radio.ontinued public education on the all hazard weather radio.	2015	Ongoing	We currently text, email, and page alerts on the following programs; Textcaster, Facebook, twitter, and Nextdoor.	Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	30	PCA
Floods										
Discourage new development in floodplains and flood-prone areas.										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance	Local Plans and Regulations	High	Ongoing	Will provide legal mechanism to enforce floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Local Plans and Regulations	High	Ongoing	Will reduce future vulnerability to flood.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	Insurance companies are aware of the current flood plans and working with their insured. Through the CRS program, the county encourages the purchase of flood insurance.	Education and Awareness Programs	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing	Those in the current area that are new are being updated and requested to have flood insurance in place. Through the CRS program, the county does an outreach each year.	Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing	We are in the planning stage for this effort.	Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	CRS review on going. Flood plain manager is keeping this data updated and will follow up on our flood plain plan.	Structure and Infrastructure Projects	High	Ongoing	The county in 2011 found that they did not want to enter in a buyout for those in Bean Lake as this was done once in 1993 flood.	Emergency Mgt	High	CBDG grants
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	CRS review on going. Flood plain manager is keeping this data updated and will follow up on our flood plain plan.	Structure and Infrastructure Projects	High	Ongoing	Preventing future flooding of properties that have had history of flood damage	Emergency Mgt	Low	CDBG or another grant that might be available

With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing	CRS review on going. Flood plain manager is keeping this data updated and will follow up on our flood plain plan.	Structure and Infrastructure Projects	High	Ongoing	Prevent future flooding of properties that have experienced past damage from floods	Emergency Mgt	Low	Local Budgeted Funds and Staff Time
Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing	CRS review on going. Flood plain manager is keeping this data updated and will follow up on our flood plain plan.	Structure and Infrastructure Projects	High	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	Emergency Mgt	Low	CDBG or some other grant that might be available
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2010	Ongoing	With the addition of the river gauge for Parkville added to the Missouri River now gives Parkville and Riverside a better gauge on the current water level is for their jurisdiction.	Structure and Infrastructure Projects	Medium	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	floodplain manager	50000	Local Budgeted Funds and Staff Time
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing	We have developed a "Flood Group" email for those entities along the Missouri river to keep them updated on current situations that are important to the levee group and home owners and farmers in this area as well and local jurisdictions.	Local Plans and Regulations	Medium	Ongoing	Will ensure that citizens are prepared real time for flood events.	Emergency Mgt.	50000	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing	We have developed a "Flood Group" email for those entities along the Missouri river to keep them updated on current situations that are important to the levee group and home owners and farmers in this area as well and local jurisdictions.	Local Plans and Regulations	Medium	Ongoing	Sharing of data will improve county floodplain management.	Emergency Mgt.	50000	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing	We have a SDE program that has this capability already and is updated by the Assessor office.	Local Plans and Regulations	High	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing	We work with all jurisdiction located in the flood plain to accomplish this effort.	Local Plans and Regulations	High	Ongoing	Free program that can increase floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time

Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010 405.230 Park and recreational area requirements as well as 405.240 Linear Parks and Trail Dedication	Structure and Infrastructure Projects	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	floodplain manager	Medium	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Structure and Infrastructure Projects	High	Ongoing	Will prevent flooding for moderate costs	floodplain manager	High	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and i	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Local Plans and Regulations	High	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Local Plans and Regulations	High	Ongoing	No/ or low cost to implement and require little staff support.	floodplain manager	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Local Plans and Regulations	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2010	Ongoing	Platte County Zoning Order 405.180 Storm Drainage Systems and facilities and 405.225 Stream Preservation and Buffer Zone Requirements Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Local Plans and Regulations	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										

Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing	Platte County Flood Plain manager and EM have the latest maps to work from and we are updating our information for 2019. The latest maps were adopted 04/2015 and are available in the Planning and Zoning Office.	Local Plans and Regulations	Medium	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010. Buyout are subject to approval by the county commission	Structure and Infrastructure Projects	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	High	HMGP, BRIC
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Structure and Infrastructure Projects	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	High	HMGP, BRIC
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Structure and Infrastructure Projects	High	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	floodplain manager	Medium	Local Budgeted Funds and Staff Time
Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010. Storm water plan	Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	High	HMGP, BRIC
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing	Chapter 410 - Zoning Overlay District Flood Plain Management Ordinance Current Land Use Plan has not been updated since 2010	Structure and Infrastructure Projects	High	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	floodplain manager	Medium	Unknown at this time

Farley 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Ad	Estimate of Cost ($)	Funding Source
Tornadoes										
Increase tornado preparedness.										
Work with the county to identify the need for tornado warning sirens.	2025	new		Structure and Infrastructure Projects	Medium	TBD as funding allows	Will provide storm alerting	city	Medium	FEMA grants
Floods										
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2010	Ongoing	Lack of resources		Low	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	city	TBD as available.	FEMA HMP or BRIC grants
Improve flood hazard assessments and flood mapping.										
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing	Lack of resources		Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	city	TBD as available.	Obtian assistance from the county
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Participate in the National Flood Insurance Program (NFIP).	2010	Ongoing	Lack of resources		Low	Ongoing	Will ensure reduced insurance rates for homeowners and	city	TBD as available.	No money available
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing	Lack of resources		Low	Ongoing	Having and maintaining most current FIRM map editions will allow for most	city	TBD as available.	No money available
Severe Thunderstorms										
To work with Platte County as much as possible as we have no paid employees only volunteers										
Work with the county to educate residents to prepare for severe weather.	2020	Ongoing		Education and Awareness Programs	Low	Whenever needed	No money available	Platte Co EM	No money available	No money available

2025 Northmoor Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	High	Local Budgeted Funds and Staff Time; HMGP, BRIC
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low/no cost mechanism to increase public safety.	Planning	1000	Local Budgeted Funds and Staff Time
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	1000	Local Budgeted Funds and Staff Time

Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	Emergency Mgt.	1000	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	Planning	1000	Local Budgeted Funds and Staff Time
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	local utilities	1000	HMGP, BRIC
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Unspecified	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	Planning	1000	None
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Discourage new development in floodplains and flood-prone areas.										

**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	floodplain manager	1000	Local Budgeted Funds and Staff Time
**Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will reduce future vulnerability to flood.	floodplain manager	1000	Local Budgeted Funds and Staff Time
**Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	floodplain manager	1000	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.										
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	floodplain manager	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	Local Budgeted Funds and Staff Time

**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	floodplain manager	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	Emergency Mgt.	1000	Local Budgeted Funds and Staff Time
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Will ensure that citizens are prepared real time for flood events.	Emergency Mgt.	1000	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Sharing of data will improve county floodplain management.	Emergency Mgt.	1000	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will allow for better assumptions to support mitigation activities.	Planning	1000	Local Budgeted Funds and Staff Time
**Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	Planning	1000	Local Budgeted Funds and Staff Time
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	Planning	1000	Local Budgeted Funds and Staff Time

**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Free program that can increase floodplain management.	Planning	1000	Local Budgeted Funds and Staff Time
**Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Free program that can increase floodplain management.	Planning	1000	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Will reduce floodplain vulnerability and increase greenspace.	Planning	Low	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Will prevent flooding for moderate costs	Planning	Low	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and implemented jointly.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	No/ or low cost to implement and require little staff support.	Planning	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Will reduce floodplain vulnerability and increase greenspace.	Planning	Low	Local Budgeted Funds and Staff Time

Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Will reduce floodplain vulnerability and increase greenspace.	Planning	Low	Local Budgeted Funds and Staff Time
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	1000	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	Planning	1000	HMGP, BRIC
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	Planning	1000	HMGP, BRIC
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	Planning	1000	HMGP, BRIC
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	Planning	1000	HMGP, BRIC

Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	Planning	0	Local Budgeted Funds and Staff Time
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	Planning	1000	HMGP, BRIC

2025 Parkville Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Medium	Adopted 2009 code in 2011	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
Improve existing and future storm sirens										
Purchase new/update existing storm sirens.	2025	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Continued functionality of outdoor warning systems.	emergency management	Medium	HMGP, BRIC
Increase citizen disaster preparedness.										
Provide public education materials.	2025	Ongoing		Education and Awareness Programs	High	2015	Citizens better prepared for disasters.	emergency management	Low	Local Budgeted Funds and Staff Time
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Discourage new development in floodplains and flood-prone areas.										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	emergency management	Low	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2025	Ongoing		Education and Awareness Programs	Low	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										

**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2025	Ongoing		Structure and Infrastructure Projects	High	As grants become available	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2025	Ongoing		Structure and Infrastructure Projects	High	As grants are available	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	Local Budgeted Funds and Staff Time
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	floodplain manager	Low	Local Budgeted Funds and Staff Time
Implement or improve flood warning systems.										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Will ensure that citizens are prepared real time for flood events.	public works	Low	Local Budgeted Funds and Staff Time
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Sharing of data will improve county floodplain management.	emergency management	Low	Local Budgeted Funds and Staff Time
Improve flood awareness education and preparedness training										
Distribute and promote flood preparedness information.	2015	Ongoing		Education and Awareness Programs	High	2015	Low cost mechanism to increase flood safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	planning & zoning	Low	Local Budgeted Funds and Staff Time
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Free program that can increase floodplain management.	planning & zoning	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										

Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Medium	HMGP, BRIC
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Will prevent flooding for moderate costs	planning & zoning	Medium	HMGP, BRIC
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and i	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	planning & zoning	Low	Local Budgeted Funds and Staff Time
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2025	Ongoing		Local Plans and Regulations	High	as available	No/ or low cost to implement and require little staff support.	planning & zoning	Low	Local Budgeted Funds and Staff Time
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Low	Local Budgeted Funds and Staff Time
Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2025	Ongoing		Local Plans and Regulations	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.		Low	Local Budgeted Funds and Staff Time
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	public works	High	HMGP, BRIC

Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	emergency management	Low	Unknown
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	emergency management	Low	HMGP, BRIC
Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2025	Ongoing		Structure and Infrastructure Projects	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	emergency management	Medium	HMGP, BRIC
Goal: Develop plans and adopt policies to address sound stormwater and flooding challenges										
Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	no costs identified	City Council	Low	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Increase citizen severe thunderstorm preparedness.										
Provide public education materials.	2025	Ongoing		Education and Awareness Programs	High	2020	Citizens better prepared for disasters.	emergency management	Low	Local Budgeted Funds and Staff Time
Increase mass notification alert and warning capabilities.										
Utilize Textcaster system for City	2025	Ongoing		Local Plans and Regulations	High	2020	Low cost mechanims to increase public aleart and warning.	emergency management	donated	donated

2025 Platte City Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Low/no cost mechanism to increase public safety.	building code official	Low	General Fund
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While may increase building costs, will lead to greater occupant safety	building code official	Low	General Fund
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	While may increase building costs, will lead to greater occupant safety	building code official	Low	General Fund
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	Low	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Low/no cost mechanism to increase public safety.	planning & zoning	Low	General Fund
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	city admin	Medium	General Fund
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness Programs	Low	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	planning & zoning	Low	General Fund

Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	Low	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	local utilities	High	General Fund
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Unspecified	Low	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	city admin	Medium	General Fund
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Unspecified	Low	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Discourage new development in floodplains and flood-prone areas.										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	planning & zoning	Low	General Fund
**Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to flooding.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will reduce future vulnerability to flood.	planning & zoning	Low	General Fund
**Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	city admin	Medium	General Fund
Enhance public awareness and education efforts related to flooding.										

Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	Low	General Fund
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing		Education and Awareness Programs	Low	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	General Fund
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	General Fund
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC, FMA
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	HMGP, BRIC, FMA
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	HMGP, BRIC, FMA
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	floodplain manager	Low	HMGP, BRIC, FMA
Implement or improve flood warning systems.										
Determine the need for stream gauges in waterways without flood warning systems or additional stream gauges in waterways with flood warning systems already in-place.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	public works	Medium	General Fund
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will ensure that citizens are prepared real time for flood events.	public works	Low	General Funds

Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Sharing of data will improve county floodplain management.	emergency management	Low	General Fund
Improve flood hazard assessments and flood mapping.										
**Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will allow for better assumptions to support mitigation activities.	planning & zoning	Low	General Fund
**Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning & zoning	Low	General Fund
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	public works	Low	General Fund
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Free program that can increase floodplain management.	public works	Low	General Funds
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Medium	General Fund
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Will prevent flooding for moderate costs	planning & zoning	Medium	General Fund
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of collaboration and identify specific programs and activities that can be developed and i	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	planning & zoning	Low	General Fund
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	No/ or low cost to implement and require little staff support.	planning & zoning	Low	General Fund

In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Low	General Fund
Work with area environmental groups, property owners and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Low	General Fund
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	General Fund
Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	General Fund
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	High	General Fund
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	Medium	General Fund
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	floodplain manager	Low	General Fund
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	floodplain manager	Low	General Fund

Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants and pumping stations.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	Medium	General Fund
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	city admin	Low	General Fund
Severe Thunderstorms										
Increase citizen preparedness for severe thunderstorms.										
Provide education and awareness	2015	Ongoing		Education and Awareness Programs	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	City budget

2025 Platte Woods Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	High	Local Budgeted Funds and Staff Time; HMGP, BRIC
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										

Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	local utilities	Low	HMGP, BRIC
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Install generator at city hall and other critical facilities.										
Mutual Aid Agreements	2015	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	Low	Local
Floods										
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS).	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget

2025 City of Riverside, MO Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Add a second siren controller										
Add a second siren controller	2025	New		Structure and Infrastructure Projects	Medium	Ongoing	Medium	emergency management	Medium	Local Budgeted Funds and Staff Time; HMGP, BRIC
Floods										
Review and update 2009 Emergency Flood Operations Manual										
Review and update 2009 Emergency Flood Operations Manual	2025	New		Local Plans and Regulations	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Develop plans and adopt policies to address sound stormwater and flooding challenges										
Adopt new stormwater engineering design and management standards and stream setback development standards to reduce the risk of stream and flash flooding	2025	New: Participating in review of draft standards under development	Metro KC APWA Section is working with consultants to complete the new standards in 2025	Local Plans and Regulations	High	12/31/2026	Medium	City Council	Low	Local Budgeted Funds and Staff Time
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	building code official	Low	Local Budgeted Funds and Staff Time
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010			Local Plans and Regulations	Medium	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	city admin	Low	Local Budgeted Funds and Staff Time
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	None	None
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time

Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	public works	High	HMGP, BRIC
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	emergency management	Low	Local Budgeted Funds and Staff Time
Floods										
Enhance public awareness and education efforts related to flooding.										
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to home owners and businesses in flood-prone areas.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	Local Budgeted Funds and Staff Time
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	Local Budgeted Funds and Staff Time
Improve citizen preparedness.										
Continue public education programs	2015	Undetermined		Education and Awareness Programs	High	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning & public works	Low	Local Budgeted Funds and Staff Time
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing		Local Plans and Regulations	High	Ongoing	Free program that can increase floodplain management.	planning & public works	Low	Local Budgeted Funds and Staff Time
Improve outdoor warning capability										
Add additional outdoor siren as city develops.	2015	Undetermined		Structure and Infrastructure Projects	Low	Ongoing	Will ensure continued ability to alert citizens.	emergency management	Medium	Local Budgeted Funds and Staff Time
Improve public alert and warning systems.										
Continue to develop mass notification systems to the community- Upgrade capabilities	2015	ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Local Budgeted Funds and Staff Time
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										

Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood of flooding.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Will prevent flooding for moderate costs	Planning	Low	HMGP, BRIC
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	floodplain manager	High	HMGP, BRIC
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	floodplain manager	Low	Local Budgeted Funds and Staff Time

Tracy 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administration	Estimate of Cost ($)	Funding Source
Tornadoes									
Improve tornado preparedness									
Construct tornado shelter	2015	Ongoing		Structure & infrastructure	High	Will provide safe refuge for residents.	city	High	Apply for HMGP grant
Install tornado outdoor warning siren.	2015	Ongoing	work with county to identify possible steps to increase warning systems	Unspecified	High	Will provide warning capability to residents	city	Med	Apply for HMGP grant
Floods									
Improve flooding preparedness									
Review need for levees or other flood control improvements along rivers in and through the city	2025	new		Local plans and regulations	High	High cost will offset recovery and cleanup costs from flooding.	city	Medium	TBD as grants available
Design and install improvements to city stormwater system.	2015	Ongoing		Unspecified	High	High cost will offset recovery and cleanup costs from flooding.	city	High	Seek FEMA HMGP grant
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.									
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Local plans and regulations	high	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP)	2010	Ongoing		Local plans and regulations	high	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget

2025 City of Weatherby Lake, MO Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Adopt ordinances requiring the underground placement of new electric and telecommunication transmission lines.										
This would increase the resilience of the communication and data lines in the city with little or no cost.	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Anchor and strengthen above ground transmission lines, poles, and similar structures.										
Strengthen existing telecommunication and electric lines.	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Low or No Cost	HMGP, BRIC
Assess the existing facilities for storm shelter suitability and confirm they are clearly marked. Provide communication to inform visitors and employees of the locations.										
	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Develop and distribute to residents and developers information on safe rooms. Partner with emergency management and trade organizations to conduct safe room seminars.										
Develop and distribute information materials on the use and construction of safe rooms.	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Low	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Require the use of tempered or shatter-resistant glass in the windows of new construction where large numbers of people may congregate. Retrofit existing facilities.										
While this may increase building cost, it will lead to greater occupant safety.	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Low/No Cost	HMGP, BRIC
Retrofit or add storm shelters to existing public facilities with inadequate protection from tornadoes or high wind.										
Review current shelter needs.	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Low or No Cost	HMGP, BRIC
Review and enhance regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.										
Low to no cost to increase public safety	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low/No Cost	Local Budgeted Funds and Staff Time
Work with trade organizations to inform builders and developers of construction techniques and materials that may minimize tornado and wind damage to structures.										
Low or no cost mechanism to increase public safety.	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low or no cost	Local Budgeted Funds and Staff Time
Floods										
Adopt ordinances prohibiting structure development in flood plains or flood-prone area.										
Adopt an ordinance to participate in the National Flood Insurance Program and legal mechanism to enforce flood plain management.	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Consider participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS).										
	New, reviewed in 2025	Ongoing	This would help to provide reduced flood insurance rates for homeowners and assist in controlling recovery costs.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Local Budgeted Funds and Staff Time

Consider the construction of detention basins, small ponds, and greenways or riparian corridors in areas of new development to channel and catch storm water. This would help mitigate damage if a flood event occurs.										
	New, reviewed in 2025	Ongoing	This will help to mitigate damage in the event of a flood for moderate costs.	Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Medium	HMGP, BRIC
Develop a strategy for acquiring flood prone property for use as green space or parks within the guidelines of current land use plans.										
	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.										
	New, reviewed in 2025	Ongoing	This will ensure citizens are prepared in the event of an imminent flood.	Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to floods.										
This will reduce future vulnerability to fllooding.	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Encourage home owners and businesses to purchase flood insurance.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Encourage utility providers to assess their facilities, distribution systems, and infrastructure for vulnerability to flooding and, if necessary, retrofit or modify them.										
	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Obtain brochures and related publications on flood mitigation, preparedness, response, and recovery from FEMA, SEMA, Red Cross, and other organizations. Provide this material to home owners and businesses in flood prone areas.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Low	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Obtain parcel data (assessed value) for flood boundary areas and enhance vulnerability assessments for these area.										
	New, reviewed in 2025	Ongoing	Data that is readily available and can be imported to identify potential areas for increased mitigation efforts.	Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Obtain the latest copies of flood rate maps, also known as FIRMS, flood plain maps, and similar documents.										
	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low or No Cost	Local Budgeted Funds and Staff Time
Work with local governments and jurisdictions to share data from flood warning systems.										
	New, reviewed in 2025	Ongoing	Sharing data will improve county floodplain management.	Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Severe Thunderstorms										
Continue to monitor and maintain the tornado warning sirens located in the city.										

The sirens are tested once a month by the county and the local jurisdictions report the status.	New, reviewed in 2025	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Provide information and education to the residents on the ways to access emergency weather information. This would include the use of the internet, social media, and weather radios.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Provide information to residents on the benefits of registering for TextCaster emergency and civic information texts and emails.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Severe Winter Weather										
Obtain pamphlets and information handouts on safety measures and coping with severe winter weather. This information will be provided and distrubuted to city residents										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Extreme Heat										
Collect pamphlets and written information on coping with severe heat events. Disseminate this information to the residents of the city.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Low	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Encourage residents to register for TextCaster notices to provide safety information during excessive heat events.										
	New, reviewed in 2025	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Local Budgeted Funds and Staff Time
Partner with FEMA, SEMA, MARC and other civic organizations to identify cooling stations for residents in need during excessive heat events.										
	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time
Partner with FEMA, SEMA, MARC, and other civic and emergency management organizations to locate supplies such as water, ice, first aid, fans and other material in the event of a severe heat event.										
	New, reviewed in 2025	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Emergency Mgt.	Low or No Cost	Local Budgeted Funds and Staff Time

Weston 2025 Mitigation Strategy *(Continuing Plan Participant, NFIP Participant)*

Mitigation Goals and Action Steps	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/Administ	Estimate of Cost ($)	Funding Source
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	High	3/1/2015	Low/no cost mechanism to increase public safety.	planning & zoning	Low	Unknown
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate. Retrofit existing facilities.	2010	Ongoing		Unspecified	High	TBD	While may increase building costs, will lead to greater occupant safety	planning & zoning	Low	Unknown
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Ongoing		Unspecified	High	TBD	While may increase building costs, will lead to greater occupant safety	planning & zoning	Medium	Unknown
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	planning & zoning	250	General Fund
Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	planning & zoning	Low	Unknown
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Medium	12/1/2015	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to	planning & zoning	500	General Fund
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Unknown
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	High	TBD	Would reduce recovery costs and better limit damage/interruption to electrical and communications	local utility	High	utility companies
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	0	City budget
Increase public awareness and understanding the benefits of "safe rooms."										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium	42095	Low/no cost mechanism to increase public safety.	emergency management	250	General Fund
Update emergency sirens within five years.										

Look for grants to purchase updated sirens	2015	Ongoing		Local Plans and Regulations	High	Spring 2017	Would ensure primary outdoor alerting system is functional.	emergency management	Medium	Unknown
Floods										
Discourage new development in floodplains and flood-prone areas.										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Unspecified	High	Ongoing	Will provide legal mechanism to enforce floodplain management.	planning & zoning	Low	City of Weston
**Develop or amend comprehensive and/or land use plans to specifically address development in flood-prone areas and recommend strategies for decreasing the jurisdiction's	2010	Ongoing		Unspecified	High	Ongoing	Will reduce future vulnerability to flood.	planning & zoning	Low	City of Weston
Enhance public awareness and education efforts related to flooding.										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Unspecified	High	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	Low	City of Weston
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, the American Red Cross and other organizations and provide them to	2010	Ongoing		Unspecified	High	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	City of Weston
Partner with emergency services, public health, human services organizations, appropriate state and federal agencies and the business community to conduct special public education events,	2010	Ongoing		Unspecified	High	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	City of Weston
Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.										
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing		Unspecified	Medium	Ongoing	Preventing future flooding of properties that have had history of flood damage	planning & zoning	Low	City of Weston
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Unspecified	High	Ongoing	Preventing future flooding of properties that have had history of flood damage	planning & zoning	Low	City of Weston
Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	floodplain manager	Low	City of Weston
Implement or improve flood warning systems.										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	High	Ongoing	Will ensure that citizens are prepared real time for flood events.	public works	Low	City of Weston
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Unspecified	Medium	Ongoing	Sharing of data will improve county floodplain management.	emergency management	500	General Fund
Improve flood hazard assessments and flood mapping.										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	High	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased	public works	Low	City of Weston
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Ongoing		Unspecified	High	Ongoing	Free program that can increase floodplain management.	public works	Low	City of Weston

Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore or enhance ecosystems and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Unspecified	Medium	12/1/2015	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	500	General Fund
Consider the construction of detention basins, small lakes and greenways or riparian corridors in areas of new development to channel and catch storm water, thereby reducing the likelihood	2010	Ongoing		Unspecified	High	Ongoing	Will prevent flooding for moderate costs	planning & zoning	Medium	City of Weston and contractors
Develop partnerships between regional emergency management, floodplain management and environmental groups to educate one another and the public of the benefits of	2010	Ongoing		Unspecified	High	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	planning & zoning	Low	City of Weston
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Unspecified	Medium	12/1/2015	No/ or low cost to implement and require little staff support.	planning & zoning	500	General Fund
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as open space or park land.	2010	Ongoing		Unspecified	Medium	12/1/2015	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	500	General Fund
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing		Unspecified	High	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of	floodplain manager	Low	City of Weston
Participate in the National Flood Insurance Program (NFIP) .	2010	Ongoing		Unspecified	High	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling	floodplain manager	Low	City of Weston
Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Unspecified	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	public works	Medium	City of Weston
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Unspecified	High	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly	emergency management	Low	City of Weston
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2010	Ongoing		Unspecified	High	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	emergency management	Low	City of Weston
Encourage water and wastewater districts to elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants, potable water treatment plants	2010	Ongoing		Unspecified	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	emergency management	Medium	City of Weston

2025 Ray County Mitigation Strategy										
Mitigation Goals and Action Steps	**Plan Year**	**Status of Project**	**Status Explanation**	**Type of Mitigation Activity**	**Priority**	**Date of Completion**	**Cost/Benefit Review**	**Primary Agency Responsible for Implementation/ Administration**	**Estimate of Cost ($)**	**Funding Source**
Tornadoes										
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2025	Completed 2015 version		Local Plans and Regulations	Low	Completed	Low/no cost mechanism to increase public safety.	county commission	Low	County Revenue
Encourage identification of existing shelters or construction of new community tornado shelters										
Work with cities, fire protection districts, school districts, faith-based organizations, businesses and others to identify existing buildings that could be designated as emergency shelters.	2025	New		Education and Awareness Programs	Medium	New	Businesses will develop safe rooms.	county commission	Medium	FEMA HMP or BRIC grant
Work with cities, fire protection districts, school districts, faith-based organizations, businesses and others to identify opportunities for the construction of new shelters, either as part of a new building or a stand-alone shelter building.	2025	New		Education and Awareness Programs	Medium	New	Identification would be beneficial at low cost.	county commission	High	FEMA HMP or BRIC grant
Review tornado and other emergency warning systems used throughout the county and determine if additional sirens and/or systems are needed to warn and protect the public.										
Work with cities and other public organizations to evaluate existing warning systems and develop plans to add sirens and/or other warning systems in the county	2025	New		Structure and Infrastructure Projects	High	New	Could save lives	county commission	High	FEMA HMP or BRIC grant
Floods										
Update GIS and other mapping resources to identify flood-prone areas										
Update GIS and other mapping layers including updated FIRM maps to help cities, the county and the public identifiy floodprone properties to avoid development in those areas.	2025	New		Local Plans and Regulations	High	Ongoing	Low cost mechanism to increase public safety.	P&Z administrator	Low	Local Budgeted Funds and Staff Time

2025 City of Richmond, MO Mitigation Strategy	Plan Year	Status of Project	Status Explanation	Type of Mitigation Activity	Priority	Date of Completion	Cost/Benefit Review	Primary Agency Responsible for Implementation/ Administration	Estimate of Cost ($)	Funding Source
Tornadoes										
Educate and raise awareness about the variety of roles and responsibilities needed before and after a tornado.										
Provided opportunities like workshops and exercises to inform city staff and volunteers about the different roles and responsibilities needed after a tornado.	2015	Ongoing		Education and Awareness Programs	Low	Ongoing	Medium	Emergency Mgt.	Low	Richmond City Budget
Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.										
Adopt current edition of the model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Completed	Adopted 2015 IBC in November, 2018	Local Plans and Regulations	Medium	Nov-18	Medium	Planning	Low	Richmond City Budget
Inform builders/developers of construction techniques and materials that may minimize tornado/high wind damage to residential/commercial structures.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Require the use of tempered or shatter-resistant glass in the windows of new public/private facilities where large numbers of people may congregate.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	High	HMGP, BRIC
Review and enhance (if necessary) regulations related to the design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Completed	Adopted 2015 IBC in November 2018.	Local Plans and Regulations	Medium	Completed	Medium	Planning	Low	Richmond City Budget
Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing	Ordinance requires underground electric for new development.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Increase the public's awareness and understanding of weather conditions that can produce tornadoes and steps that can be taken to keep safe during a tornado.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Richmond City Budget
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	New businesses are encouraged to develop emergency tornado plans for safe room locations and post in visible locations for visitors and employees.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	New businesses are encouraged to develop emergency tornado plans for safe room locations and post in visible locations for visitors and employees.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	New businesses are encouraged to develop emergency tornado plans for safe room locations and post in visible locations for visitors and employees.	Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Consider adopting ordinances or regulations requiring the construction of tornado shelters in new buildings where people live, work, or congregate.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Local Plans and Regulations	Low	Ongoing	Medium	Planning	Low	Richmond City Budget

Encourage residential/commercial builders/developers to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Low	HMGP, BRIC
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	Fire Department is researching funding and grant opportunities from public tornado shelters.	Structure and Infrastructure Projects	Medium		Medium	Planning	High	HMGP, BRIC
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Medium	Emergency Mgt.	Low	Richmond City Budget
Update plans to ensure that current resources and information is included for quick and effective response to a tornado.										
Update the Local Emergency Operations Plan to include current shelter and city staff contact information.	2015	Ongoing	Update in progress.	Local Plans and Regulations	Medium	Ongoing	Medium	Emergency Mgt.	Low	Richmond City Budget
Floods										
Improve flood hazard assessments and flood mapping.										
Conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps based on GIS technology to identify areas at risk from flooding.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Coordinate the collection of demographic, economic, watershed, land use, and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Integrate flood mitigation strategies with projects and activities designed to (1) protect, restore, or enhance ecosystem, and the environment and/or (2) create recreational opportunities for the community.										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Medium	Planning	Medium	Richmond City Budget
Participate in, and ensure compliance with, flood mitigation and floodplain management programs.										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps, and similar documents.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Participate in the National Flood Insurance Program (NFIP) and consider joining the Community Rating System (CRS).	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Low	Richmond City Budget
Reduce flood-related damage to public, residential, and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.										
Identify incentives to offer homeowners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Local Plans and Regulations	Medium	Ongoing	Medium	Planning	Medium	Richmond City Budget
Severe Thunderstorms										

Chapter 6: Plan Maintenance

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Chapter 6: Plan Maintenance

Requirement §201.6(c)(4)(i)): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the plan within a five-year cycle.*

6.1 Monitoring, Evaluating and Updating the Plan

This plan will be reviewed and evaluated annually or following a disaster to determine the effectiveness of planned mitigation actions; reflect changes in laws, regulations and/or policies; reprioritize mitigation actions, if necessary, and consider other issues affecting hazard mitigation in the Kansas City metropolitan area. The Metropolitan Emergency Managers Committee (MEMC) has included this review as part of its annual work program. The MEMC covers the five counties included in this plan in addition to four Kansa counties – Johnson, Leavenworth, Miami and Wyandotte. Beginning in 2021, the MEMC will review both the plan adopted for the Kansas counties and this Plan for updates. The Hazard Mitigation Plan Steering Committee will meet with Kansas representatives to discuss coordination of hazard mitigation planning efforts in 2025.

The MEMC/Planning Team, in accordance with the roles and responsibilities outlined in Attachment 1, will be responsible for coordinating annual reviews of the plan for their represented jurisdictions. The annual review process shall include an evaluation of the plan's effectiveness for the area. Criteria used to evaluate the plan includes:

- The goals and objectives address current and expected conditions
- The nature, magnitude and/or types of risk have changed
- The current resources are appropriate for implementing the plan
- There are implementation problems, such as technical, political or legal or there are coordination issues with other agencies
- The outcomes have occurred as expected
- The agency and partners participated as originally proposed

During these reviews, mitigation goals and actions will be reevaluated and updated to reflect current status as appropriate. Jurisdictions wishing to add new mitigation goals and actions will work with the Planning Team/MEMC to determine steps necessary to incorporate changes into the adopted 2025 Plan. Those jurisdictions submitting new goals and actions should develop a planning process narrative in accordance with the requirements for mitigation strategies outlined in this plan. The narrative should be submitted to the jurisdiction's respective Planning Team member for review, who will forward to MARC for formatting and incorporation into this plan. MARC will continue to provide administrative support in accordance with the roles and responsibilities of Plan Author as defined in Attachment 6.1.

In order for mitigation efforts to become more fully incorporated into regional planning efforts for the Kansas City metropolitan area, the review of the Hazard Mitigation Plan, and the mitigation strategies will be reviewed by the Metropolitan Emergency Managers Committee. The Metropolitan Emergency Managers Committee, a committee coordinated by Mid-America Regional Council, serves as a forum for local emergency managers to discuss and resolve regional issues, problems, projects and activities related to all-hazards emergency management. In addition, the 2025 Plan will be reviewed by representatives from Climate Action KC. Climate Action KC, a nonprofit regional compact made up of

more than 100 local and state elected officials, working to organize strategies to draw down greenhouse gases and improve climate resilience.

For this update, participating jurisdictions appointed a responsible party to act as a central point of contact and coordinate the update process for their community. These individuals are listed in Attachment 6.2. During the yearly reviews, MARC will contact these individuals and ask for their review and update of information about their jurisdiction. For each action proposed by the participating jurisdiction there is a "Primary Agency Responsible" designated for implementing mitigating goals and actions. These agencies shall provide the status of their mitigation projects to their community's responsible party, as listed in Attachment 6.2. If a community's responsible party changes, they are asked to notify their Planning Team/MEMC representative of the change.

Every five years, the Planning Team/MEMC will conduct a comprehensive review of the *Regional Multi-Hazard Mitigation Plan* and document the actions taken, changing conditions regarding the risks faced by the region from natural hazards and revisions to hazard mitigation actions representing a full update to the plan. The model used for this update process will continue to be used for future updates; the roles and responsibilities outlined in Attachment 6.1 will be maintained. The following generic timeline should be used to guide the five-year plan update process. All dates are listed as time remaining (T-) until plan expiration:

T-22 months:
1.) *MARC*: Notify Planning Team, participating and potential new jurisdictions of upcoming update process.
2.) *MARC*: Request authorizations from MEMC and MARC Board and/or participating jurisdictions for MARC to act as Plan Author on jurisdiction's behalf (if desired).

T-21 months:
1.) *MARC*: Apply for grant funding through SEMA.
2.) *MARC/Planning Team*: Confirm participation requirements, desired updates, changes in regulations. Begin full review of plan. Set kickoff meeting dates and times.
3.) *MARC/Planning Team:* Begin collecting contact information for all potential jurisdictions and organizations to ensure that all potential participants receive the initial invitation to be involved.

T-19 months:
1.) *MARC/Planning Team*: Complete full review of plan, confirm required updates
2.) *MARC*: Begin research on any changes to the hazard profiles and recent hazard events. Create materials for kick off meetings.
3.) MARC: Form Hazard Mitigation Plan Steering Committee
4) *MARC*: Begin advertising meeting date for kick off meeting for representatives from participating jurisdictions and other parties interested in contributing to the update process.

T-16 months:
1.) *MARC/Planning Team/Participating Jurisdictions/Other interested parties*: Begin kickoff meeting to review process for update, review historical and recent occurrences of the various hazards, and review data collection and plan participation requirements. Hold follow-up meetings as necessary.
2.) *Participating jurisdictions:* Begin submitting required information about hazard risks and capabilities (Community Profile information) to MARC.

3.) *MARC:* Analyze and assess the information received through the Community Profile submission. Develop materials for public meetings to explain hazards and the capabilities on hand. Incorporate information received into draft update.

T-14 months:
1.) *MARC/Planning Team/Participating Jurisdictions:* Disseminate and collect surveys from stakeholders and the public for input to the HMP. Publish information on MARC website and through MARC e-newsletters.

T-12 months:
1.) Participating Jurisdictions: Status report on past mitigation strategies and development of new mitigation strategies. Participating jurisdictions and organizations will consider the hazards that are likely to impact their constituents and the tools/capabilities available to address the hazards and they will create goals and actions to continue building upon the capabilities already in place.
2.) MARC: MARC staff will collect the mitigation strategy information for past and future goals and actions and incorporate the information into the draft update.

T-6 months:
1.) *MARC:* Complete first draft, submit to Planning Team for review and approval
2.) *Planning Team:* Review/Approve first draft

T-5 months:
1.) *MARC:* Submit first draft to SEMA.
2.) *MARC:* Make corrections to draft.
3.) *MARC/Planning Team/Participating Jurisdictions:* Advertise and conduct final public review and comment period.
4.) *Planning Team*: Review/Approve corrections to draft.

T-3 months:
1.) *MARC:* Submit final draft to SEMA for forwarding to FEMA
2.) *MARC:* Make any corrections from FEMA. Submit to Planning Team for review/approval and resubmittal to FEMA.
3.) *MARC/Planning Team/Participating Jurisdictions:* Once FEMA approves, participating jurisdictions adopt by formal resolution, and forward to FEMA.
4.) MARC: Begin collecting local resolutions demonstrating local jurisdictions have adopted the plan.

A number of data deficiencies were identified through this update to be addressed prior to the next update to extent possible –pending available information. Table 6.1 identifies these deficiencies, These data deficiencies are from the 2015 Plan. The list must be evaluated, and deficiencies can be added or deleted. Where progress has been made on addressing each data deficiency, the status should also be updated in Table 1.2 in the Introduction and Planning Process section.

Table 6.1 Data Deficiencies identified [From the 2020 Plan]		
Data Deficiency	**Action to Be taken**	**Responsible Party**
1. Dam inundation pathways still in process of being shared with local officials or not yet available	Continue to work the MDNR and local dam owners to obtain information/maps showing dam failure inundation pathways as part of EAP update/completion process	Planning Team
2. Levee failure analysis information largely unavailable	Continue to work with USACE and other entities to obtain levee failure analysis information as it becomes available	Planning Team
3. Future land use data unavailable for Ray County	MARC has incorporate future land use maps for Ray County into the 2025 Plan.	Ray County Planning Team representative, MARC
4. Various data collection/interpretation deficiencies were noted for winter weather, heat wave, drought, HazMat and infectious disease due to certain inherent limitations	Continue to reassess hazards and data collection methods for next update. As new collection methods and interpretation techniques become available, incorporate into plan update	Planning Team, MARC
5. Utility infrastructure - Research Services of MARC does not have access to this data at present	MARC continues to work with local jurisdictions and utility companies are working to address this.	Planning Team, MARC
6. Data regarding homes without basements –	MARC has asked for this information; some jurisdictions have their GIS files able to support this type of analysis, but a number of jurisdictions do not. MARC will continue to seek this information	MARC
7. Building counts – not all jurisdictions maintain a GIS layers of building points or building outlines. MARC digitized many buildings by hand as part of a SOLAR grant and has worked to make updates.	As jurisdictions develop GIS capabilities this information will be incorporated in future updates.	Participating Jurisdictions
8. Critical facilities – don't have measures of size or capacity or capabilities for most of	As jurisdictions continue to implement HAZUS software this information become more accessible.	Participating jurisdictions, MARC

Table 6.1 Data Deficiencies identified [From the 2020 Plan]		
Data Deficiency	**Action to Be taken**	**Responsible Party**
them. This information would help produce more meaningful maps and visualizations.		
9. Addresses of repetitive flood loss properties would have been helpful in mapping the general locations where flooding occurs that is more likely to damage property.	Continue to work with jurisdictions and the State Emergency Management Agency to determine options for obtaining this type of information.	Participating jurisdictions, MARC

Minor data limitations continue to exist for estimating probability of future occurrence and potential damages for drought, heat waves and severe winter storms. Specific limitations are discussed in each hazard profile.

6.2 Incorporation into Existing Planning Mechanisms

Incorporation of the mitigation strategies, goals, and actions into other planning mechanisms, as identified by each jurisdiction, is discussed in full in Section 3. The planning process used to update the plan will continue to tie hazard risk assessment for each jurisdiction to the capabilities and resources that the jurisdictions have available. Through Community Profile, jurisdictions and organizations identify the hazards that for which their jurisdictions are most at risk. In addition, the jurisdictions and organizations report on the administrative, technical, financial, and programmatic (education and outreach) resources that they have in place. Participating jurisdictions and organizations are encouraged to consider this information as they identify mitigation goals and actions. In the end, the goal is to establish a cycle where the Hazard Mitigation Plan update process drives changes and improvements in the local planning mechanisms and capabilities and also, local planning processes will ultimately identify projects and initiatives that can be supported in the Hazard Mitigation Plan.

6.3 Continued Public Involvement

Public involvement in the mitigation planning process — from plan development through implementation of mitigation actions and plan review, evaluation and revision — is important to the success and sustainability of a community's (and the region's) mitigation efforts. As stakeholders in the mitigation process, the public should be given the opportunity to influence the policy decisions that will affect their communities.

The residents of participating jurisdictions that have adopted this plan will be encouraged to participate in the plan maintenance and review process.

Copies of the plan will be available for review through MARC's website and shared through participating jurisdictions to help the public with information and to respond to questions. Contact information and the method for submitting comments and suggestions regarding the plan (i.e., e-mail, social media addresses, etc.) will also be posted on the MARC website. The availability of this plan will also be publicized in MARC's printed, online and electronic newsletters and through MARC's social media. Participating jurisdictions will also publicize the availability of this plan in community newsletters and related publications or on their websites. All information regarding plan availability will continue to be posted in accordance with the provisions of the Missouri Sunshine Law. Additional information regarding Missouri's Sunshine Law can be found on the Web site of Missouri's Attorney General at https://ago.mo.gov/missouri-law/sunshine-law.

During the yearly reviews, the Planning Teams will use PrepareMetroKC.org website and other means to direct the public to the plan's availability and again solicit information on topics of mitigation concern to the community. Specific information regarding public involvement efforts as part of the planning process can be found in **Section 1.3.5.** Additional media outlets for potential advertising are found **in Section 2.6.**

6.4 Attachments

Attachment 6.1: Hazard Mitigation Steering Committee (HMSC) Members Roles and Responsibilities

I. Roles

A. *Planning Team:*

Justin Crane, Director, Cass County Emergency Management
Representing the following Cass County communities:

- Belton – Claire Canaan, Emergency Management
- Harrisonville
- Lake Winnebago – Ken Smith, Emergency Management
- Peculiar
- Pleasant Hill
- Raymore
- Archie R-V School District
- Belton School District
- Harrisonville School District
- Pleasant Hill School District
- Raymore-Peculiar School District
- Sherwood-Cass R-8 School District

Anne Poelzl, Emergency Management, Sheriff's Office, Clay County
Grace Wineinger, Emergency Management, Sheriff's Office, Clay County
Representing the following Clay County communities:

- Excelsior Springs
- Gladstone
- Kearney
- Lawson
- Liberty
- North Kansas City – Dan Williams, NKC Fire Department
- Smithville
- Excelsior Springs School District
- Lawson School District
- Liberty School District
- North Kansas City School District
- Smithville R-II School District

Troy Schulte, Manager, Jackson County (replaced by Brian Gaddie)
Randy Diehl, Public Works Department
Representing the following Jackson County communities:

- Blue Springs
- Greenwood

- Grandview
- Independence – Dante Gliniecki and Janelle Scofield, Emergency Management
- Lee's Summit – Benjamin Hicks
- Levasy – Kimberlyn Dyer
- Kansas City, MO – Christopher Carroll, Emergency Management
- Oak Grove – Mark Sherwood
- Raytown – Dyon Harper
- Central Jackson Co Fire Protection District – Jason Bonney
- Sni-Valley Fire Protection District – Mark Sherwood
- Blue Springs R-IV School District
- Fort Osage School District
- Grain Valley School District
- Independence School District
- Kansas City School District
- Lee's Summit R-VIII School District
- Oak Grove R-VI School District
- Metropolitan Community Colleges

Jason Phelps, Deputy Assistant Emergency Management Coordinator, Platte County Sheriff's Department
Capt. Daniel Gates, Emergency Management Coordinator, Platte County Sheriff's Department
Representing the following Platte County communities:

- Farley
- Lake Waukomis
- Northmoor
- Parkville
- Platte City
- Platte Woods
- Riverside
- Tracy
- Weatherby Lake
- Weston
- Northland Regional Ambulance District (NRAD)
- West Platte Fire District
- Park Hill School District
- Park University
- Platte County R-III School District
- West Platte R-II School District

Presiding Commissioner Sheila Tracy, Ray County
Representing the following Ray County Jurisdictions:

- City of Richmond

Community Organization Stakeholders
Carol Ayers, Community Disaster Resiliency Network
Ryan Hicks, Life Unlimited
Sharon White-Lewis, Medical Reserve Corps
Victor Webb, Housing Authority of Kansas City, MO

State and Federal Officials
Gloria Brandenburg, SEMA
Jonathan Kurz, National Weather Service

B. ***Plan Production and Coordination, Mid-America Regional Council (MARC):***
Melinda Cheney, Exercise and Planning Manager
Marlene Nagel, Community Development Director

- Project manager, process facilitator, co-author and researcher

John Davis, Emergency Services Administrative Support

- Data management and document design

Erin Lynch, Emergency Services and Homeland Security Program Director

- Editor and project oversight

Jay Herrmann, GIS Manager

- Research and GIS lead

Madeline Wetta, Data Librarian

- Research and data lead

Jakob Goldman, GIS Specialist II

- GIS mapping, coordination and research

Sara Hintze, Database Analyst

- Developed online planning tools

Catherine Couch, Public Affairs Coordinator

- Lead graphic designer; marketing coordinator

Daiko Abe, ISC Consultants

- Provided guidance to ensure FEMA requirements are met within the plan
- Drafted Chapter 4 Hazard Analysis

II. Responsibilities

A. *Plan Coordination*

1. Provide administrative support for the update process to include, but not limited to:
   a. Organize meetings, send mailings, draft and incorporate plan revisions, conduct research, etc.
   b. Provide the Planning Team with recommendations and advice on plan requirements as well as electronic and/or hard copies of updates to the plan as they are drafted for review and comment
   c. Assist in the development of mitigation strategies.
   d. Provide monthly updates and other information as requested to SEMA in accordance memorandum of agreement.
   e. Compile comments, revisions, evaluations, etc., from future reviews and updates and integrate into plan.

B. ***Planning Team***

1. Oversee the update process to include, but not limited to:
   a. Determine requirements for satisfactory participation.
   b. Review and approve all revisions to the hazard mitigation plan.
   c. Provide locations to host meeting opportunities.
   d. Work with represented jurisdictions to assist in gathering required information and developing mitigation strategies.
   e. Organize yearly reviews of the plan for represented jurisdictions. Review all new information submitted and forward to Plan Author for incorporation.

C. ***Participating Jurisdictions***

1. Inform the update process by accomplishing the following:
   a. Complete all requirements for satisfactory participation as determined by the Planning Team.
   b. Review and comment on the plan as drafts become available. Formally adopt the completed plan by resolution.
   c. Participate in yearly reviews of the plan and subsequent five-year updates. Submit changes as necessary to Planning Team representative for review and forward to Plan Author.
   d. Designate a responsible party to coordinate the above and notify Planning Team representative of designee by name, job title, organization or any other satisfactory method upon appointment or when a change occurs. Responsible parties for participating jurisdictions shall be listed in Attachment 2 to this section.

Attachment 6.2: 2025 Participating Jurisdictions' Designated Responsible Parties

Jurisdiction	Responsible Party (Name)	Title
1. Cass County	Justin Crane	Emergency Management Director
2. Clay County	Will Akin/Anne Poelzl	Emergency Management Director
3. Jackson County	Brian Gaddie	Public Works Director
4. Platte County	Deputy Jason Phelps Capt. Daniel Gates Daniel Romig	Deputy Asst. Emergency Management Coordinator Emergency Management Coordinator Asst. Emergency Management Coord.
5. Ray County	Presiding Commissioner Sheila Tracy	Presiding County Commissioner
6. Belton	Claire Canaan	Director of Emergency Management
7. Blue Springs	Michael Mallon	Senior Director of City Development
8. Central Jackson Co Fire Protection District	Jason Bonney	Assistant Chief of Emergency Management
9. Excelsior Springs	Joe Maddick	Fire Chief
10. Farley	Kathy O'Neal	Chairman of the Board of Aldermen
11. Gladstone	Mike DeSautels	Emergency Management Director/Fire Chief
12. Grain Valley	Ken Murphy	City Administrator
13. Grandview	Emily Spittler	Planner
14. Greenwood	Mitchell Armer	Chief of Police
15. Harrisonville	Rusty Sullivan	Emergency Services Director
16. Independence	Dante Gliniecki	Emergency Management Director
17. Kansas City, Mo	Christopher Carroll	Emergency Manager
18. Kearney	David Pavlich	Community Development Director
19. Lake Annette	Angela Hansen	Mayor
20. Lake Waukomis	Rick Zelfer	Emergency Management Director
21. Lake Winnebago	Kenneth Smith	Emergency Management Director
22. Lawson	Stan Dobbins Bruce Summa	City Administrator Chief of Police
23. Lee's Summit	Benjamin Hicks	Assistant Chief
24. Levasy	Kim Dyer	Mayor
25. Liberty	Chris Young	Fire Chief
26. North Kansas City	Dan Williams	Fire Chief/EMD
27. Northland Regional Ambulance District	Jason James	Executive Director
28. Northmoor	Julie Rowden	City Clerk
29. Oak Grove	Mark Sherwood	Emergency Management Director
30. Parkville	Jon Jordan	Captain
31. Peculiar	Don Shepard	Police Chief, Interim City Administrator
32. Platte City	Joe Wellington	Chief of Police

Jurisdiction	Responsible Party (Name)	Title
33. Platte Woods	Jim Kerns	Emergency Management Director
34. Pleasant Hill	Tommy Wright	Police Chief/Emergency Manager
35. Pleasant Valley	Jared McGinley	Chief of Police
36. Raymore	Tim Baldwin	Emergency Management Coordinator
37. Raytown	Dyon Harper	Police Captain
38. Richmond	Mark Sowder	Fire Chief/EM Director
39. Riverside	Keith Payne	Emergency Manager/Police Chief
40. Sni Valley Fire Protection District	Mark Sherwood	Emergency Management Director
41. Smithville	Jason Lockridge	Chief of Police
42. Tracy	Barbara Stewart	City Clerk/Collector
43. Weatherby Lake	Donnie Hachman	Chief of Police
44. Weston	Kelly Clark	Chief of Police
45. Archie R-V School District	Michelle Witzk	Superintendent
46. Blue Springs R-IV School District	Mike Russell	Director, Public Safety
47. Excelsior Springs School District	Jarent Tomlinson	Superintendent
48. Fort Osage R-I School District	Steve Morgan	Assistant Superintendent
49. Grain Valley School District	Nicholas Gooch	Assistant Superintendent
50. Harrisonville School District	Josh Chastain	Superintendent
51. Independence School District	Greg McGhee	Director of Facilities
52. Kansas City School District	Linda Quinley	Assistant Superintendent/COO
53. Lawson School District	Michael Stephenson	Superintendent
54. Lee's Summit R-VIII School District	Ryan Hall	Supervisor of Safety & Environmental Services
55. Liberty School District	Gary Majors	Director of Safety and Security
56. North Kansas City School District	Mitzi Boydston	Director of Safety & Security
57. Oak Grove R-VI School District	Tracy Kemp	Superintendent
58. Park Hill School District	Chad Phillips	Director of Safety and Security
59. Platte County R-III School District	Devin Doll	Executive Director of Operations
60. Pleasant Hill School District	Wayne Burke Mike Clevenger	Superintendent Director of Facilities
61. Raymore-Peculiar School District	Bryan Pettengill	Assistant Superintendent
62. Richmond School District	Trey Cavanah	Assistant Superintendent

Jurisdiction	Responsible Party (Name)	Title
63. Sherwood-Cass School District	Morris Jeffries	Director of Facilities
64. Smithville R-II School District	Ian Saxton	Executive Director of Operations
65. West Platte R-II School District	Brock Dover	Superintendent
66. Metropolitan Community Colleges	Andrea Schatz	Chief Legal Counsel
67. Park University	Jeff Hurley	Director of Campus Safety