



# REGIONAL MULTI-HAZARD MITIGATION PLAN



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

MID-AMERICA REGIONAL COUNCIL ♦ 2020



## FOREWORD

To Residents of the Kansas City Region:

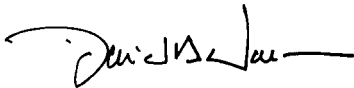
Since its beginnings in the early 1800s, the Kansas City metropolitan area has experienced the adverse effects of natural disasters. Historical records indicate that natural hazards, particularly floods and tornadoes, have had a profound effect on the region. Unfortunately, there is no way to prevent 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.

As of November 1, 2004, all local governments must have an approved hazard mitigation plan to be eligible to apply for and receive certain funds under this program. 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 citizens of Cass, Clay, Jackson, Platte and Ray counties with hazard mitigation planning, implementation and evaluation. 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](mailto:info@marc.org).

Sincerely,



David A. Warm  
Executive Director



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## 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 August of 2015. 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. In 2015, the *Regional Multi-Hazard Mitigation Plan* was updated, ensuring the continuity of federal mitigation project grant funding through May of 2020.

The *Regional Multi-Hazard Mitigation Plan* is a multi-jurisdictional plan that represents a number of local governments within the Kansas City region. The following local governments and school districts 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

### **Clay County**

Excelsior Springs  
Gladstone  
Kearney  
Lawson  
Liberty  
Mosby  
North Kansas City  
Smithville  
Fishing River Fire Protection District  
Excelsior Springs School District  
Lawson School District  
North Kansas City School District  
Smithville R-II School District

### **Jackson County**

Blue Springs  
Grandview  
Greenwood  
Independence  
Kansas City, Mo.  
Lee's Summit  
Oak Grove  
Raytown  
Central Jackson County FPD  
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**

Dearborn  
Farley  
Ferrelview  
Houston Lake  
Lake Waukomis  
Northmoor  
Parkville  
Platte City  
Platte Woods  
Riverside  
Tracy  
Weatherby Lake  
Weston  
Northland Regional Ambulance District  
West Platte Fire Protection District  
North Platte R-1 School District  
Park Hill School District  
Platte County R-3 School District  
West Platte R-II School District  
Park University

### **Ray County**

Richmond

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 Review Subcommittee (HMPC) comprised of key stakeholders from Cass, Clay, Jackson, Platte and Ray counties and participating jurisdictions. The HMPC 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.

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 4: Mitigation Strategy. Social, technical, administrative, political, legal, economic and environmental factors were considered when identifying and prioritizing mitigation actions. New online tools were developed 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 2025.

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## Section 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 37 cities, five fire/ambulance districts, 19 school districts and two colleges/universities, updated this *Regional Multi-Hazard Mitigation Plan* in order to 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 2025.

### 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 August 2015, three events occurred which resulted in federal major disaster declarations and federal emergency declarations. In the months leading up to the approval of the last Plan, severe storms, tornadoes, straight-line winds, and flooding affected the region between May 15, 2015 and July 27, 2015. From March 11, 2019 to April 16, 2019 severe storms, straight-line winds, and flooding affected the region. Shortly thereafter, severe storms, tornadoes, and flooding affected the region between April 29, 2019 and July 5, 2019. For the event in 2015, Platte, Clay, and Ray qualified for public assistance. For the second severe storm event, Platte and Ray counties were included in the disaster declaration (DR-4435) for public assistance needed. For the third event, Jackson, Platte and Ray were included in the major disaster declaration (DR 4451). Jackson qualified for individual and public assistance, Platte qualified for individual assistance, and Ray qualified for public assistance. Twenty-two separate events related to hazardous weather have caused property damage and/or loss of life throughout the region from 2015-2019. 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.

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\*

**Clay County\***

Excelsior Springs\*  
 Gladstone\*  
 Kearney\*  
 Lawson  
 Liberty\*  
 Mosby\*  
 North Kansas City\*  
 Smithville\*  
 Fishing River Fire Protection District\*  
 Excelsior Springs School District  
 Lawson School District\*  
 North Kansas City School District\*  
 Smithville R-II School District\*

**Jackson County\***

Blue Springs\*  
 Grandview\*  
 Greenwood  
 Independence\*  
 Kansas City, Mo.\*  
 Lee's Summit\*  
 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\***

Dearborn\*  
 Farley\*  
 Ferrelview\*  
 Houston Lake\*  
 Lake Waukomis\*  
 Northmoor\*  
 Parkville\*  
 Platte City\*  
 Platte Woods\*  
 Riverside\*  
 Tracy\*  
 Weatherby Lake\*  
 Weston\*  
 Northland Regional Ambulance District\*  
 West Platte Fire Protection District\*  
 North Platte R-1 School District\*  
 Park Hill School District\*  
 Platte County R-3 School District\*  
 West Platte R-II School District\*  
 Park University\*

**Ray County\***

Richmond\*

\*Denotes 2015 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)

### 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 September 28, 2018, 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 May 1, 2020, 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 August 28, 2018 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 four times during the planning process – April 2, 2019, June 21, 2019, January 9, 2020, and March 25, 2020 to provide guidance to the Mid-America Regional Council staff in the preparation of the plan. A formal kickoff meeting was held on April 2, 2019, at the Kauffman Foundation Conference Center in Kansas City, Missouri, with representatives from local jurisdictions and the public 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 73 representatives from local jurisdictions, nonprofit organizations, and federal agencies present at the meeting, and table 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 and Research Services to work on the plan, and an initial meeting was held on November 15, 2018. A meeting was held with representatives from SEMA and FEMA on November 28, 2018.

The Steering Committee for the Hazard Mitigation Plan (HMPC) was formed to guide and coordinate the planning process and to review the plan materials as they were developed. The HMPC consisted of selected representatives from the Missouri counties in the MARC region, as well as the cities of Kansas City and Independence, Mo. 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 Planning Committee formally convened, MARC staff and a consultant reviewed the 2015 Regional Hazard Mitigation Plan, the 2018 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 consultant and MARC staff outlined a proposal for the process and timeline for completing the HMP update. The proposed planning process and timeline was presented in concept at the April 2, 2019, kickoff meeting and to the HMPC for discussion at their second meeting.

### **1.3.2 Planning Team Kickoff**

The 2020 update planning process formally began at the April 2, 2019, 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 HMPC 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 2015 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 HMPC 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 the city of Kansas City, Missouri, the city of Kearney, city of Grandview and the city of Independence.

After the model for the Plan update was confirmed, the HMPC identified which threats and hazards would be considered in the update. To assist this determination, the HMPC reviewed hazards identified in the State of Missouri's 2018 Hazard Mitigation Plan, the hazards addressed in the region's 2015 Plan (and recommendations for improvements), and hazards identified through the THIRA process. The steering committee decided that the 2020 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 county hosted meetings or separate work sessions with either a planning team representative or a MARC staff member.
2. For 2015 plan participants, update the 2015 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 and public meetings through social media
9. Host opportunities for public involvement (e.g. link local Internet presence to a plan website).

In order to achieve six of the requirements (#2-7/#2-6), the HMPC agreed to a proposal that participating organizations would be asked to provide information for the update through a series of surveys or tools including a Community/ School Profile, a 2015 Hazard Mitigation Goals and Actions Status Update Tool for those communities that participated in the last plan, and a 2015 Hazard Mitigation Goals and Actions Tool for all current participating organizations to complete. Each county in the planning area would host kick off meetings for local jurisdictions, school districts/universities/colleges, and fire/ambulance districts in September 2019 to learn 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 2015 plan and others in the five-county area about participating in the 2020 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 county hosted meetings that MARC helped to facilitate.

Participating organizations were encouraged to attend the county community engagement meetings. All organization were encouraged to form an internal planning team to review 2015 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 Summary of Planning Meetings** 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**.

<b>Table 1.1: Summary of Planning Meetings</b>			
<b>Meeting</b>	<b>Date</b>	<b>Purpose of Meeting</b>	<b>Attendees</b>
HMP Review	11/15/2018	Discuss revisions and plan reformatting, Adding hazards, mitigation actions, schedule for future meetings.	Planning Team, MARC
Guidance Meeting	11/28/2018	Discuss plan requirements, available resources from SEMA and FEMA, advice on focus of priority natural hazards for plan	SEMA AND FEMA representatives, MARC staff
Kick-off	April 2, 2019	Background, Planning Team formation, Initial planning, participation requirements.	Local jurisdiction stakeholders, Planning Team, MARC (73 in attendance)
County Kick-Off – Ray County	September 4, 2019	Provide introduction, background, information and requirements regarding the planning process to representatives of Cass County jurisdictions. Review risk profiles and online tool for updating plan information, including capabilities and goals.	Ray County (Commissioners and staff), Richmond, Orrick, Hardin, Camden, Henrietta, Fleming, Wood Heights, Orrick School District, Richmond School District, Richmond Daily News
County Kick-Off – Cass County	September 11, 2019	Provide introduction, background, information and requirements regarding the planning process to representatives of Cass County jurisdictions. Review risk profiles and online tool for updating plan information, including capabilities and goals.	Cass County, Harrisonville, Lake Winnebago, Peculiar, Pleasant Hill, Raymore, Belton School District, Harrisonville School District, Raymore-Peculiar School District, MARC
County Kick-Off – Platte County	September 6, 2019	Provide introduction, background, information and requirements regarding the planning process to representatives of Platte County jurisdictions. Review risk profiles and online tool for updating plan information, including capabilities and goals.	Platte County, Houston Lake, Kansas City, Lake Waukomis, Parkville, Riverside, Platte City, Tracy, Weatherby Lake, Northland Regional Ambulance District, Park Hill School District, Platte County R-3 School District, MARC
County Kick-Off – Clay County	September 12, 2019	Provide introduction, background, information and requirements regarding the planning process to representatives of Clay County jurisdictions. Review risk profiles and online tool for updating plan information, including capabilities and goals.	Clay County, Excelsior Springs, Kearney, North Kansas City, Liberty, Smithville, Fishing River Fire District, MARC

<b>Table 1.1: Summary of Planning Meetings</b>			
<b>Meeting</b>	<b>Date</b>	<b>Purpose of Meeting</b>	<b>Attendees</b>
County Kick-Off – Jackson County	September 10, 2019	Provide introduction, background, information and requirements regarding the planning process to representatives of Jackson County jurisdictions. Review risk profiles and online tool for updating plan information, including capabilities and goals.	Jackson County, Blue Springs, Central Jackson Co Fire Protection District, Grandview, Greenwood, Independence, Kansas City, Lee’s Summit, Oak Grove/Sni Valley FPD, Blue Springs School District, Ft. Osage School District, Grain Valley School District, Lee’s Summit School District, Metropolitan Community College, Univ of MO Ext., KC COAD, Red Cross, Truman Medical Center, MARC
Second Meeting to Solicit Input for Plan	December 13, 2019	Provide local jurisdiction stakeholders and residents an opportunity to offer feedback on the capabilities assessment and input to mitigation strategies considered by jurisdictions in Jackson County.	Jackson County (Health, Emergency Management), Independence, Oak Grove/Sni Valley FPD, Greenwood, Grandview, Raytown, Kansas City, Blue Springs, Central Jackson County FPD, Lee’s Summit (Fire, Public Works), COAD, MARC
Second Meeting to Solicit Input for Plan	December 18, 2019	Provide local jurisdiction stakeholders and residents an opportunity to offer feedback on the capabilities assessment and input to mitigation strategies considered by jurisdictions in Cass County.	Cass County, Belton, Peculiar, Raymore, Pleasant Hill, Belton School District, Harrisonville School District, Grandview (Fire, EM, Community Development), Lee’s Summit, MARC
Second Meeting to Solicit Input for Plan	December 11, 2019	Provide local jurisdiction stakeholders and residents an opportunity to offer feedback on the capabilities assessment and input to mitigation strategies considered by jurisdictions in Platte County.	Platte County (P&Z, Emergency Management, Parks, Public Works, Sheriff’s Dept), Northmoor, Parkville, Lake Waukomis, Lawson School District, Park Hill School District, MARC
Second Meeting to Solicit Input for Plan	December 5, 2019	Provide local jurisdiction stakeholders and residents an opportunity to offer feedback on the capabilities assessment and input to mitigation strategies considered by jurisdictions in Ray County.	Ray County (Commissioners, Emergency Management), P&Z), Richmond, Lawson (City Administration, Emergency Management, Lawson School District, MARC

Meeting	Date	Purpose of Meeting	Attendees
Second Meeting to Solicit Input for Plan	January 8, 2020	Provide local jurisdiction stakeholders and residents an opportunity to offer feedback on the capabilities assessment and input to mitigation strategies considered by jurisdictions in Clay County.	Clay County (Emergency Management, Public Health, NKC, Kansas City, MO; FEMA, Excelsior Springs School District, Kearney, Smithville, MARC
Hazard Mitigation Planning Committee Meeting	January 9, 2020	Review participant status and challenges experienced with the data collected.	Regional Hazard Mitigation Planning Committee
Hazard Mitigation Planning Committee Meeting	March 25, 2020	Review draft plan and authorize submission for approval by FEMA.	Regional Hazard Mitigation Planning Committee

### 1.3.3 Plan Section Review and Update Methodology

To minimize the burden of the update, the HMPC 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 2015 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* (October 1, 2014) and *Multi-Jurisdictional Mitigation Planning*, 2006 and presented the HMPC with recommendations. **Table 1.2** describes the data deficiencies that were present during the 2015 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 *2015 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 2020 plan efforts or future efforts.

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 <a href="mailto:ryan.stack@dnr.mo.gov">ryan.stack@dnr.mo.gov</a> 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

**Table 1.2: Data Deficiency Corrective Actions 2015 and 2020**

<b>Data Deficiency</b>	<b>Action Required</b>	<b>Status</b>	<b>Responsible Party</b>
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
3. Future land use data unavailable for Ray County	Incorporate future land use maps for Ray County as developed	Continue to work with county on this information once prepared by the county. The county has indicated that they are beginning to work on a new Comprehensive Plan.	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
5. Utility infrastructure - Research Services of MARC does not currently have access to this data at present	Through collaboration with jurisdictions and utility companies are working to address 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 next time MARC asks for a parcel update will seek this information.	Information is not yet available.	MARC
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
8. Critical facilities – don't have measures of size or capacity or capabilities for most of them. This information would help	As jurisdictions continue to implement HAZUS software this information become more accessible.	MARC has developed extensive databases of critical facilities in the five-county area and that information is provided to	Participating jurisdictions, MARC

**Table 1.2: Data Deficiency Corrective Actions 2015 and 2020**

Data Deficiency	Action Required	Status	Responsible Party
produce more meaningful maps and visualizations.		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.	
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.	Have not collected this information	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 HMPC. 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 HMPC provided MARC with comments and feedback during planning meetings and via e-mail.

As plan sections were drafted they were posted on the MARC website at <https://www.marc.org/Emergency-Services-9-1-1/MEMC/Activities/2020-Hazard-Mitigation-Plan> and made available to the HMPC members for view and comment. The final draft of the plan was approved for submission by the HMPC by February 14, 2020.

<b>Table 1.3: Review Process Summary</b>				
<b>Section</b>	<b>Reviewed (Yes/No)</b>	<b>Revisions Made (Yes/No)</b>	<b>Basis for Revisions</b>	<b>Summary of Revisions</b>
Introduction & Planning Process	Yes	Yes	Added information on meetings held and public input received	Updated table with additional information
Planning Area Profile	Yes	Yes	Plan reorganization and updated demographics	Updated with current information and new, relevant figures and charts were added.
Capabilities Assessment	Yes	Yes	Plan organization New survey tools	Assembled data for each local jurisdiction from the online data tool in the Capabilities Assessment chapter
Risk Assessment	Yes	Yes	Plan reorganization. Consolidated risk assessment and vulnerability analysis.	Removed 10 man-made and low occurrence natural hazards. Updated historical hazard data. Maximum and minimum loss estimations were deleted. Sections Impact and Extent were added to fulfil gaps.
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 2020 goals and action steps

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 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 Community Profile Tools** lists the different tools that were included in the Community Profile for communities to report on<sup>1</sup>:

Table 1.4: Community Profile Tools	
Administrative & Technical	Financial
<p><b>Administrative Resources:</b></p> <ul style="list-style-type: none"> <li>*Planning and Zoning Commission</li> <li>*Mitigation Planning Committee</li> <li>*Maintenance Program to reduce risk</li> <li>*Mutual aid agreement</li> </ul> <p><b>Staffing Resources:</b></p> <ul style="list-style-type: none"> <li>*Chief Building Official</li> <li>*Floodplain Administrator</li> <li>*Emergency Manager</li> <li>*Community Planner</li> <li>*Civil Engineer</li> <li>*Public Health Official</li> <li>*IT Support</li> <li>*GIS Coordinator</li> </ul> <p><b>Technical Resources:</b></p> <ul style="list-style-type: none"> <li>*Warning System/Services</li> <li>*Hazard data and information</li> <li>*Critical Facilities Map/APRS</li> <li>*HAZUS Analysis</li> </ul>	<ul style="list-style-type: none"> <li>*Capital Improvement Project Funding</li> <li>*Authority to levy taxes for specific purpose</li> <li>*Fees for water, sewer, gas or electric services</li> <li>*Impact fees for new development</li> <li>*Stormwater utility fee</li> <li>*Incur debt through general and/or special tax bonds</li> <li>*Incur debt through private activities</li> <li>*Community Development Block Grant</li> <li>*Flood Mitigation Assistance Program</li> <li>*Pre-Disaster Mitigation Program</li> <li>*Hazard Mitigation Grant Program</li> </ul>



<b>Table 1.4: Community Profile Tools</b>	
<ul style="list-style-type: none"> <li>*Existing Land Use Maps</li> <li>*Future Land Use Maps</li> <li>*State Hazard Mitigation Plan</li> <li>*Grant Writing</li> </ul>	
<b>Education &amp; Outreach</b>	<b>Planning &amp; Regulatory</b>
<p><b>Existing Warning Systems:</b></p> <ul style="list-style-type: none"> <li>*Storm Sirens</li> <li>*Mass Notification Systems</li> <li>*CMAS</li> <li>*MEMC Project Community Alert</li> <li>*National Weather Service</li> <li>*Kansas City Scout</li> </ul> <p><b>Community Partnerships:</b></p> <ul style="list-style-type: none"> <li>*Regional Homeland Security Coordinating Committee</li> <li>*Metropolitan Emergency Managers Committee</li> <li>*Mid-America Local Emergency Planning Committee</li> <li>*Metropolitan Official Health Agencies of the Kansas City Area</li> <li>*Regional 9-1-1 System</li> <li>*SAVE Coalition</li> <li>*Kansas City Organization Active in Disaster</li> <li>*Community Emergency Response Team</li> <li>*Medical Reserve Corps of Greater Kansas City</li> <li>** Ongoing public education</li> <li>*Natural disaster or safety related school program</li> <li>*StormReady certification</li> <li>*Firewise Communities certification</li> <li>*Public-private partnership initiatives (disaster related)</li> <li>*Media coverage and Public Awareness</li> </ul>	<p><b>Plans:</b></p> <ul style="list-style-type: none"> <li>*Comprehensive Master Plan</li> <li>*Capital Improvement Plan</li> <li>*Economic Development Plan</li> <li>*Local Emergency Operations Plan</li> <li>*Continuity of Operations Plan</li> <li>*Public Health Emergency Preparedness Plan</li> <li>*Transportation Plan</li> <li>*Stormwater Management Plan</li> <li>*Community Wildlife Protection Plan</li> <li>*Brownfields Redevelopment</li> <li>*Climate Change Adaptation</li> </ul> <p><b>Codes:</b></p> <ul style="list-style-type: none"> <li>*Building Code</li> <li>*Fire Code</li> <li>*Mechanical Code</li> <li>*Plumbing Code</li> <li>*Dangerous Building Code</li> </ul> <p><b>Land Use Planning Policies:</b></p> <ul style="list-style-type: none"> <li>*Stream setback ordinances</li> <li>*Floodplain management ordinances</li> <li>*Soil and erosion ordinances</li> <li>*Burn ordinance</li> <li>*Storm water runoff ordinances</li> <li>*Water conservation measures</li> <li>*Open space acquisition/dedication</li> <li>*Flood buyout</li> <li>*Site plan review requirements.</li> </ul>

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

## Building Codes

A summary of tools reviewed by current and new plan participants as part of the Community Profile and the School Profile questionnaires is included in **Section 3: Capabilities**. Two data-gathering tools were used for the review process to capture information about mitigation strategies that communities and organizations are considering for the next five years. The first tool was a Web-based tool to enable jurisdictions to review and update information from the 2015 Hazard Mitigation plan. The second tool was also a Web-based tool to enable jurisdictions to review and update hazard mitigation goals and actions listed in the 2015 plan. Jurisdictions were asked to provide a status report on these goals and actions. A newly developed third tool allowed jurisdictions and organizations the ability to 1) review a summary of their updated profile, 2) review an assessment of the impact of hazards to their jurisdiction, 3) review and use a series of GIS data layers to consider further impacts to their jurisdiction from the priority hazards addressed in the plan, 4) review resources for the plan, and 5) update goals and strategies for the 2020 plan. MARC is developing a public website to display the updates of this information and to use the GIS data layer tool for ongoing planning and evaluation.

### 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, one Community meeting was held in September 2019 at a central location in each county. For Cass, Clay, Jackson, Platte and Ray counties. Representatives of jurisdictions in each county were invited to attend. Paid social media posts were placed as well as paid newspaper advertisement for Ray County Tribune. A flyer promoting the meeting was posted on the MARC website and made available to the Metropolitan Emergency Managers Committee, local planning and public works staff and others that were identified as having possible interest in the Plan.

Handouts outlining the strategies for each type of hazard were made available explaining each hazard and possible mitigation goals and strategies. Representatives from each participating jurisdiction or organization were invited to be present at the meetings and encouraged to share information and ask questions. Following the meetings, MARC staff collected comments and provided them to the appropriate jurisdiction for review and incorporation into their mitigation strategy as desired.

A second round of public meetings were held in December 2019/January 2020 to review the Capabilities Assessment and further discuss possible goals and strategies. A flyer was distributed to local jurisdiction representatives, the Metropolitan Emergency Managers Committee and other interested parties. The meeting schedule was posted on the MARC website and on MARC social media.

To get the word out about the public meetings to as many residents as possible, MARC staff posted information on its website, sent flyers electronically to various regional committees composed of representatives from local jurisdictions and other interested parties, and advertised the events through social media. **Table 1.5** shows the advertisements that were placed for community engagements.

**Table 1.5: MARC Stakeholder Community Engagement Event Advertisements**

<b>Event date</b>	<b>Description of Event, Location</b>	<b>County</b>	<b>Media Used</b>
April 2, 2019	Kickoff Meeting at Kauffman Foundation Conference Center, Kansas City, MO	Cass, Clay, Jackson, Platte, Ray	Flyer and HMTL invitations sent to large group of local stakeholders Used MARC website to promote event
Sept. 4, 2019	First Meeting for Ray County stakeholders and the public to learn about the plan and provide input to the plan contents. Ray County Eagleton Center, Richmond, MO	Ray County	Social Media – Facebook. Paid ad for Aug 30 – Sept 4 (\$15.58) <a href="https://www.facebook.com/events/">https://www.facebook.com/events/</a> Richmond Daily News ad on Aug 30 (\$)
Sept. 6, 2019	First Meeting for Platte County stakeholders and the public to learn about the plan and provide input to the plan contents. Platte County Resource Center, Kansas City, MO	Platte County	Social Media – Facebook. Paid ad for Sept 1-6 (\$50) <a href="https://www.facebook.com/events/">https://www.facebook.com/events/</a>
Sept. 10, 2019	First Meeting for Jackson County stakeholders and the public to learn about the plan and provide input to the plan contents, Independence Truman Memorial Building	Jackson County	Social Media – Facebook. Paid ad for Sept 4-10 (\$50.04) <a href="https://www.facebook.com/events/">https://www.facebook.com/events/</a>
Sept. 11, 2019	First Meeting for Cass County stakeholders and the public to learn about the plan and provide input to the plan contents. Raymore Community Center.	Cass County	Social Media – Facebook. Paid ad for Sept 6-11 (\$50) <a href="https://www.facebook.com/events/">https://www.facebook.com/events/</a>
Sept. 12, 2019	First Meeting for Clay County stakeholders and the public to learn about the plan and provide input to the plan contents. Gladstone Community Center	Clay County	Social Media – Facebook. Paid ad for Sept 7-12 (\$50.07) <a href="https://www.facebook.com/events/">https://www.facebook.com/events/</a>
Dec. 5, 2019	Second Meeting for Ray County stakeholders and the public to review capabilities assessment and discuss goals/strategies. Held at Ray County Library.	Ray County	Social Media post. Facebook.

<b>Event date</b>	<b>Description of Event, Location</b>	<b>County</b>	<b>Media Used</b>
Dec. 11, 2019	Second Meeting for Platte County stakeholders and the public to review capabilities assessment and discuss goals/strategies. Held at Platte Co Resource Center in KCMO.	Platte County	Social Media post. Facebook.
Dec. 13, 2019	Second Meeting for Jackson County stakeholders and the public to review capabilities assessment and discuss goals/strategies. Held at Grandview Community Center.	Jackson County	Social Media post. Facebook.
Dec. 18, 2019	Second Meeting for Cass County stakeholders and the public to review capabilities assessment and discuss goals/strategies. Held at Raymore Community Center.	Cass County	Social Media post. Facebook.
Jan. 8, 2020	Second Meeting for Clay County stakeholders and the public to review capabilities assessment and discuss goals/strategies. Held at Clay Co Public Health Center.	Clay County	Social Media post. Facebook.
Feb. 14, 2020	Promoted the placement of the draft 2020 plan on the MARC website to encourage review by local stakeholders and the public	All five counties	Used Social Media; Facebook; MARC website

Posts were created on MARC's social networking sites including Twitter 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 events for distribution around their community. Additionally, jurisdictions were asked to link notices for the public meetings to their cities' Web sites and community calendars, where applicable. Jurisdictions were also asked to use any other available outlets to advertise the events, such as local government access TV channels, e-newsletters and posting information to their own social networking accounts. Meeting dates and participants for each public meeting are listed in **Table 1.1 Summary of Planning Meetings**.

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, sent email notifications through local list servers and distributed fliers detailing instructions on

where to access the plan and 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 FEMA'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.

#### **1.4 Attachments**

**Attachment 1.1:** Hazard Mitigation Planning Committee (HMPC) Member Roles and Responsibilities

**Attachment 1.2:** 2020 Participating Jurisdictions' Designated Responsible Parties

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

**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

**Will Akin**, Clay County Assistant Emergency Management Director

Representing the following Clay County Communities:

- Excelsior Springs
- Gladstone
- Kearney
- Lawson
- Liberty
- Mosby
- North Kansas City
- Smithville
- Fishing River Fire Protection District
- Excelsior Springs School District
- Lawson School District
- North Kansas City School District
- Smithville R-II School District

**Mike Curry**, Director, Jackson County Emergency Preparedness

Representing the following Jackson County Communities:

- Blue Springs
- Grandview
- Greenwood
- Independence
- Kansas City
- Lee's Summit
- Oak Grove
- Raytown
- Central Jackson County Fire Protection District
- Sni Valley Fire Protection District
- Blue Springs R-IV School District
- Fort Osage 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

**Michael O'Neal**, Deputy Director, Platte County Sheriff's Department and **Anthony Avery**, Captain, Platte County Sheriff's Department (Appointed by Mark Owen, Director, Platte County Emergency Management)

Representing the following Platte County Communities:

- Dearborn
- Farley
- Ferrelview
- Houston Lake
- Lake Waukomis
- Northmoor
- Parkville
- Platte City
- Platte Woods
- Riverside
- Tracy
- Weatherby Lake
- Weston
- Northland Regional Ambulance District (NRAD)
- West Platte Fire Protection District
- North Platte R-1 School District

- 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

**James Connelly**, Emergency Manager, Kansas City, Mo. Emergency Management

**Chris Carroll**, Emergency Planner, Kansas City, Mo. Emergency Management

**Billie Hufford**, Building Official, city of Grandview, MO

**David Pavlich**, Community Development Director, city of Kearney, MO

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

**Marlene Nagel**, Community Development Director

- Project oversight and plan author

**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 Hintzes**, 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

## 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.
- 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: 2020 PARTICIPATING JURISDICTIONS'  
DESIGNATED RESPONSIBLE PARTIES**

<b>Jurisdiction</b>	<b>Responsible Party (Name)</b>	<b>Title</b>
1. Cass County	Justin Crane	Emergency Management Director
2. Clay County	Will Akin	Emergency Management Director
3. Jackson County	Mike Curry	Emergency Preparedness Director
4. Platte County	Mike O'Neal	Deputy Emergency Management Director
5. Ray County	Carl Harper	County Emergency Management
6. Belton	James Person	Chief of Police
7. Blue Springs	Chris Sandie	Assistant Director Public Works
8. Central Jackson County Fire Protection District	Les Boatright	Emergency Management Director
9. Dearborn	Don Kerns	Alderman
10. Excelsior Springs	Paul Tribble	Fire Chief
11. Farley	Teresa Bing	Mayor
12. Ferrelview	Steve Carr	Emergency Management/Health Officer
13. Fishing River Fire Protection District	Gene Walker	Fire Chief
14. Gladstone	Sean Daugherty	Emergency Management Director
15. Grandview	Dennis Randolph	Director of Public Works
16. Greenwood	Cheri Roberts	City Clerk
17. Harrisonville	Eric Myler	Emergency Services Director
18. Houston Lake	Don Coronado	Emergency Management Director
19. Independence	Dante Glinecki	Emergency Preparedness Planner
20. Kansas City, Mo	Christopher Carroll	Emergency Management Planner
21. Kearney	David Pavlich	Community Development Director
22. Lake Annette	Angela Hansen	Mayor
23. Lake Waukomis	Jeff Libby	Emergency Coordinator
24. Lake Winnebago	Kenneth Smith	Emergency Management Director
25. Lawson	Matt Nolker	City Administrator
26. Lee's Summit	Jim Eden	Assistant Chief
27. Liberty	Dustin Paddock	Fire Marshal
28. Mosby	Gene Walker	Emergency Manager
29. North Kansas City	Dave Hargis	Fire Chief
30. Northland Regional Ambulance District	Jason S James	Supervisor
31. Northmoor	Kelly Clark	Chief of Police
32. Oak Grove	Mark Sherwood	Emergency Management Director

<b>Jurisdiction</b>	<b>Responsible Party (Name)</b>	<b>Title</b>
33. Parkville	Jon Jordan	Captain
34. Peculiar	Carl Brooks	City Engineer
35. Platte City	Carl Mitchell	Chief of Police
36. Platte Woods	Michael Benne	Chief of Police/ EM Director
37. Pleasant Hill	Shelby Teubel	City Administrator
38. Raymore	Ryan Murdock	Emergency Management Coordinator
39. Raytown	Dyon Harper	Police Captain/EM Coordinator
40. Richmond	Mark Sowder	Fire Chief/EM Director
41. Riverside	Jeffery Taylor	Emergency Manager
42. Sni Valley Fire Protection District	Mark Sherwood	Emergency Management Director
43. Smithville	Jason Lockridge	Police Chief
44. Tracy	Barbara Stewart	City Clerk/Collector
45. Weatherby Lake	Gary McMullin	Chief of Police
46. Weston	Kim Kirby	City Clerk
47. West Platte Fire Protection District	Lynn Johnson	Administrator of Emergency Services
48. Archie R-V School District	Dr. Jeff Kramer	Superintendent
49. Blue Springs R-IV School District	Tom Phillips	Executive Director of Emergency Services
50. Excelsior Springs School District	Lisa Shelton	Administrative Assistant
51. Grain Valley School District	Dr. Nick Gooch	Assistant Superintendent
52. Fort Osage R-I School District	John Ruddy	Assistant Superintendent
53. Harrisonville School District	Tim Ryan	Assistant Superintendent
54. Independence School District	Salum Stutzer	Director of Facilities
55. Kansas City School District	Regina Ferguson	Risk Manager
56. Lawson School District	Roger Schmitz	Superintendent
57. Lee's Summit School District	Ryan Hall	Supervisor of Safety & Environmental Services
58. North Kansas City School District	Jon Brady	Director of Safety & Security

<b>Jurisdiction</b>	<b>Responsible Party (Name)</b>	<b>Title</b>
59. North Platte R-1 School District	Dr. Jeffrey Sumy	Superintendent
60. Oak Grove R-VI School District	Freddie Doherty	Superintendent
61. Park Hill School District	Joshua Colvin	Director Student Services
62. Platte County R-III School District	Tolan Singer	Director of Student Services
63. Pleasant Hill School District	John Griffith	Assistant Superintendent
64. Raymore-Peculiar School District	Jay Harris	Assistant Superintendent
65. Smithville R-II School District	Wayne Krueger	Assistant Superintendent
66. West Platte R-II School District	Dr. Regina Knott	Director of Special Services & Assessment
67. Metropolitan Community Colleges	Laure Christensen	Chief of Staff
68. Park Hill University	Will London	EHS Compliance Coordinator

## Section 2: Planning Area Profile

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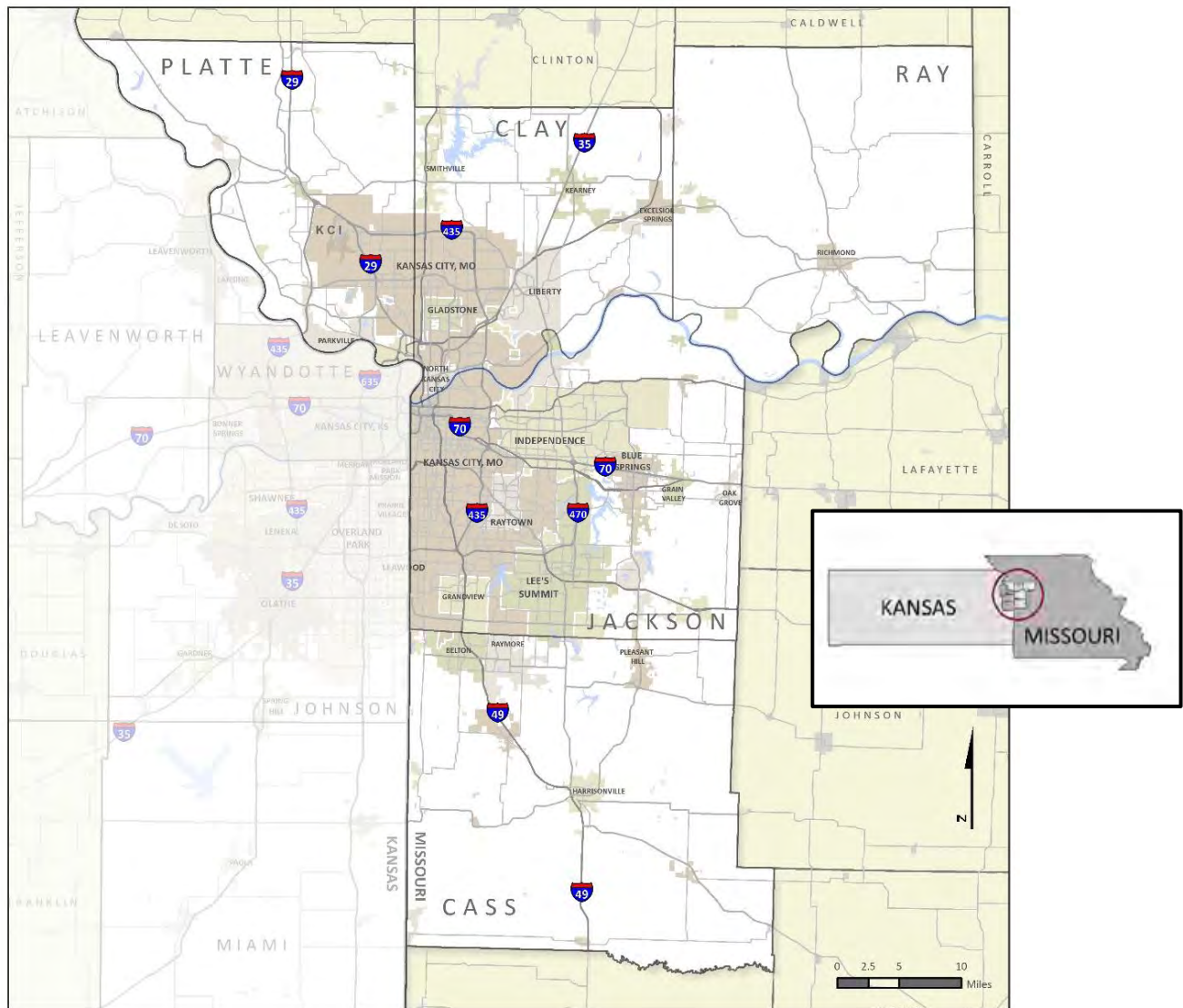
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## Section 2: Planning Area Profile

This Section discusses the people, 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



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.

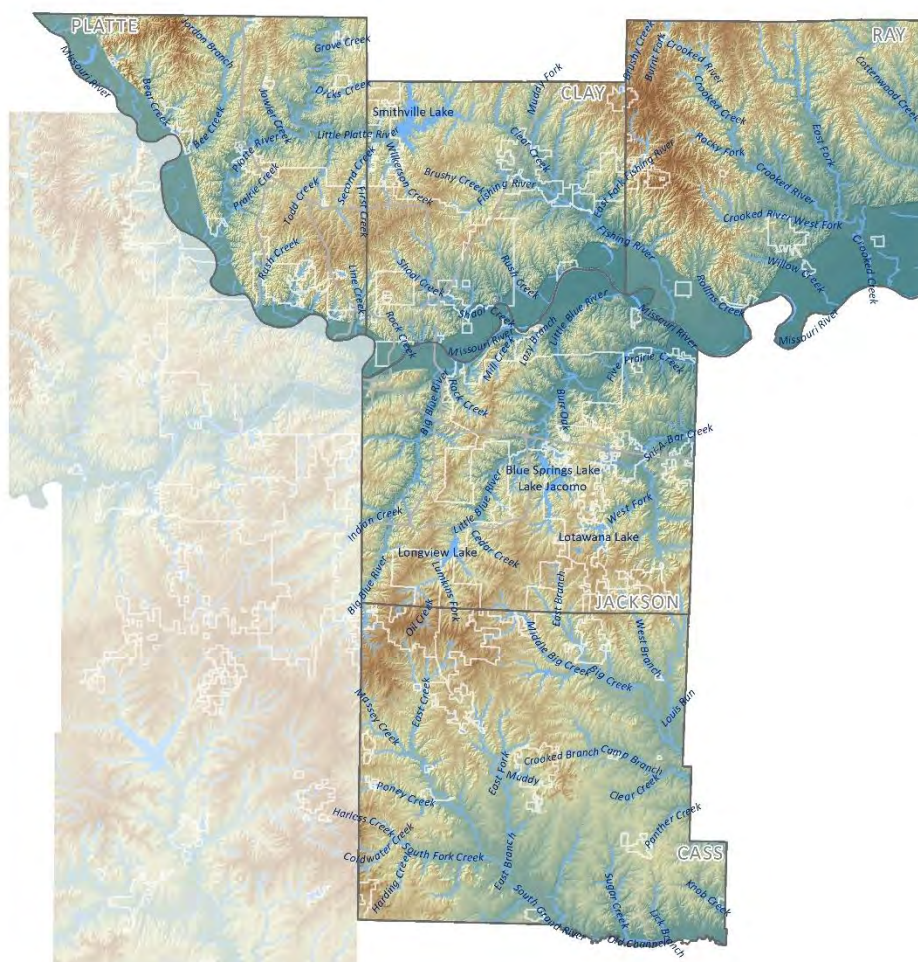
Much of the region’s water supply comes from the Missouri River, and in recent years degradation of the riverbed has become a concern. The U.S. Army Corps of Engineers conducted a multiyear study beginning in 2014 to assess riverbed degradation between Rulo, Neb., and St. Louis, Mo., focusing on the stretch of river in the Kansas City area where degradation is the most severe. The final Missouri River Bed 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.

**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.

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



**Topography and  
Water Features**

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.

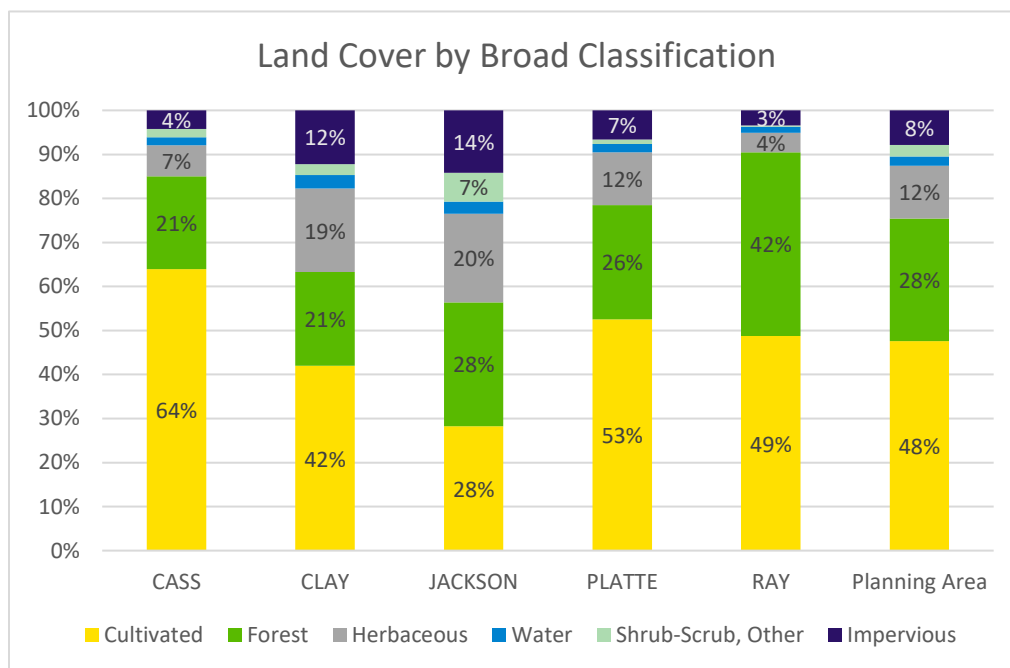
In the region's tributary valleys, the availability of ground water is limited. The alluvial deposits in these areas range in thickness from 20 to 70 feet in the lower reaches to less than 10 feet in the upper reaches. In addition, the large amounts of shale in these tributary valleys results in mainly 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**

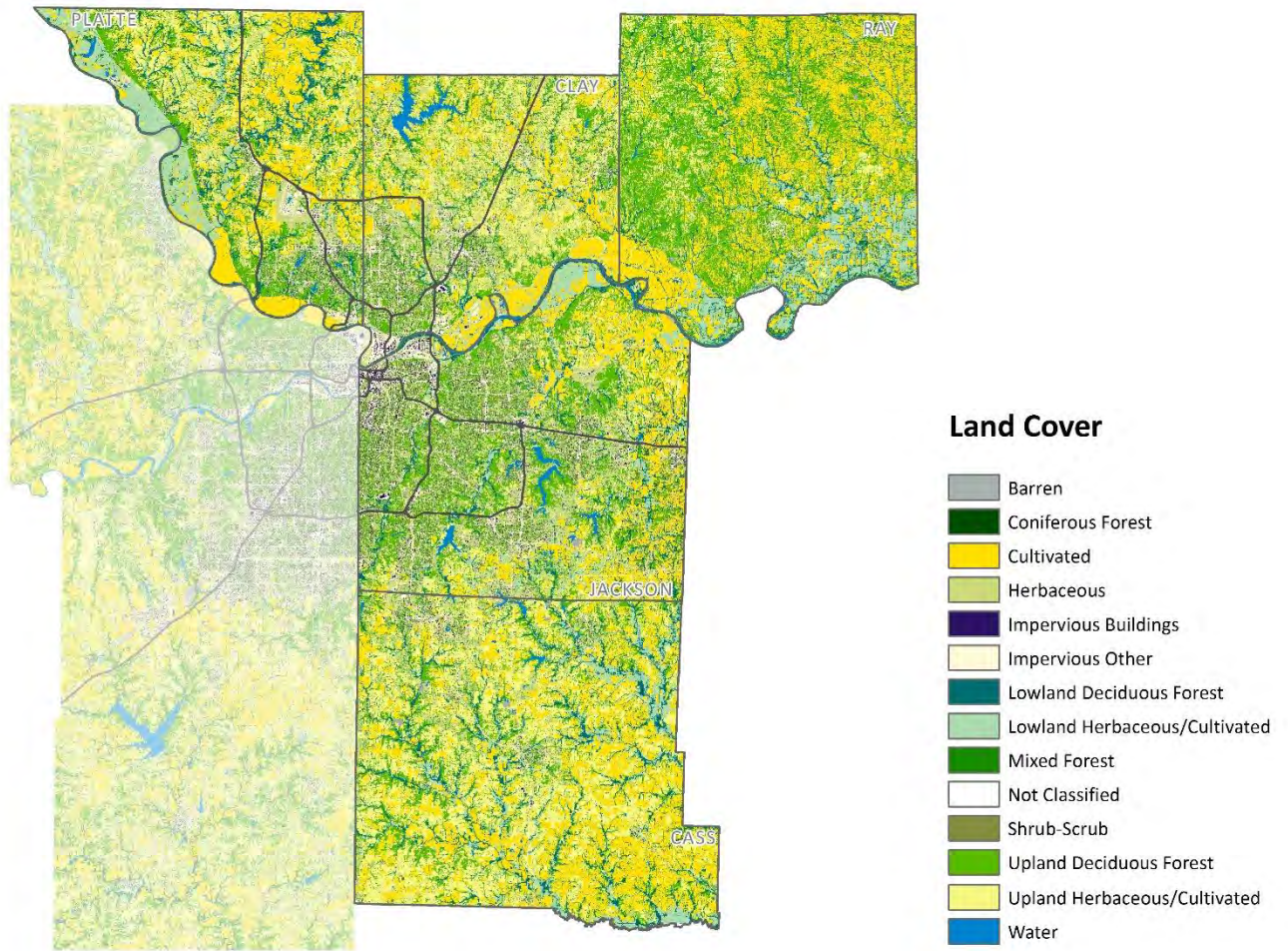
As **Figure 2.5 Topographical Land Cover** shows on the next page, the planning area’s primary land cover is cultivated at 23 percent followed by upland deciduous forest at 19 percent and upland herbaceous/cultivated at 18 percent. In **Figure 2.4**, Jackson, Clay, and Platte Counties are the Planning Area’s most urbanized counties with 14 percent, 12 percent and 7 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 planning area’s most rural county, with 49 percent of its land cultivated, another 42 percent in forests and only 3 percent as impervious surface. The next most forested counties are Jackson and Platte, with 28 percent and 26 percent forest land cover, respectively. Nearly two-thirds of the land in Cass is cultivated, as is a majority of the land in Platte County.



Source: MARC Natural Resource Inventory

**Figure 2.4: Land Cover by County**



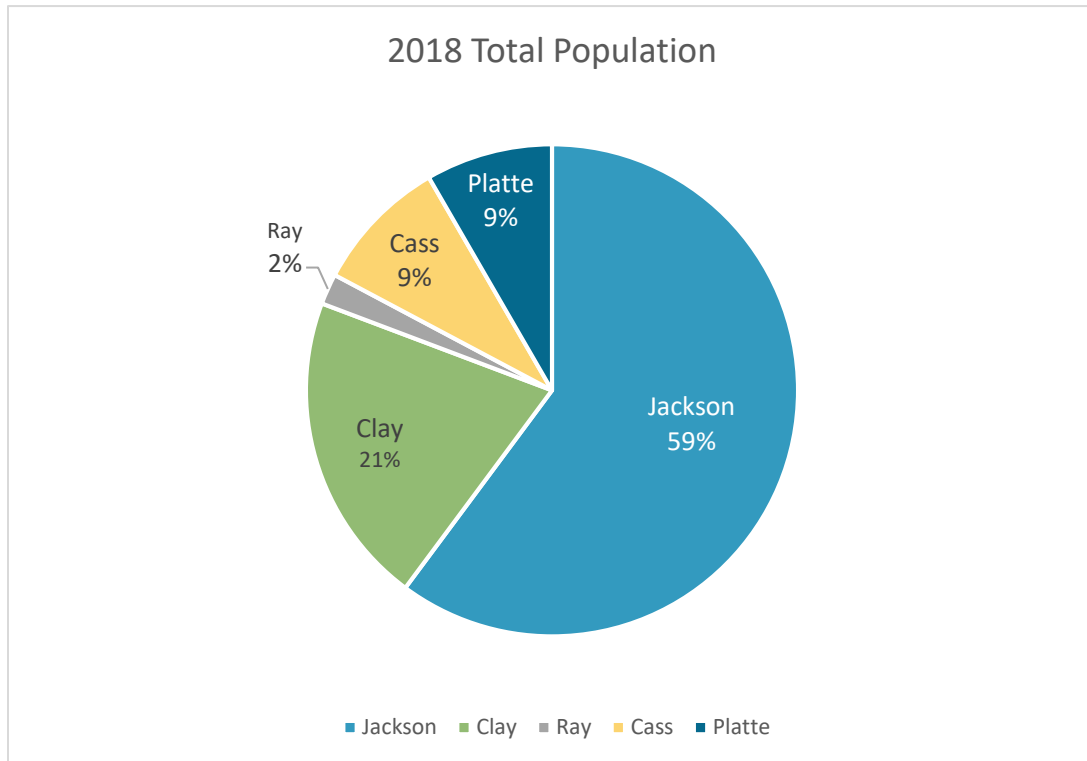


Source: MARC Natural Resource Inventory

**Figure 2.5: Topographical Land Cover**

## 2.3 Demographics

The population of the planning area in 2018 was an estimated 1,177,494. As the graph below (**Figure 2.6**) shows, about six in ten people living in the planning 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.

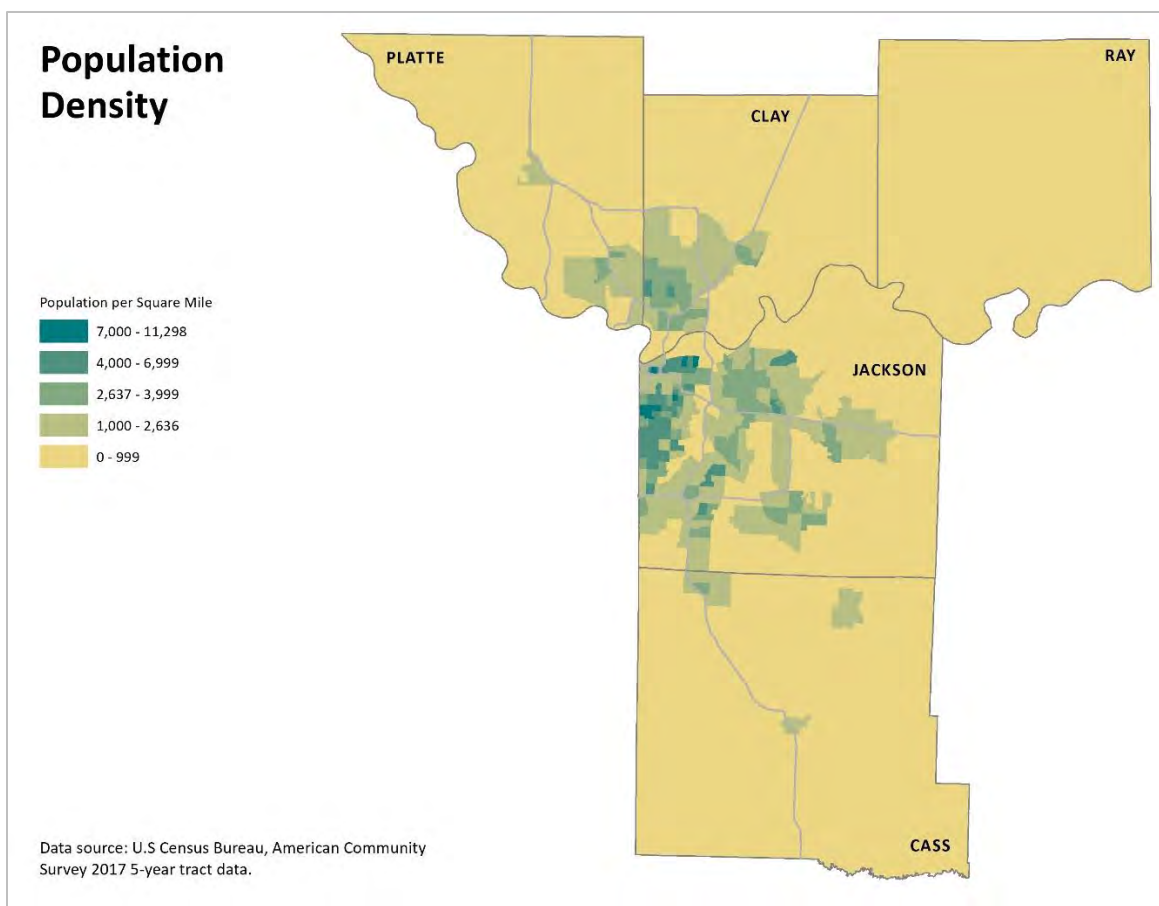


Source: Census Bureau, 2018 population estimates

**Figure 2.6 Planning Area Population**

### 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 multifamily housing create an average population density of 15.7 persons per residential acre but reach more than twice that, at 32.3 persons per residential acre, in the core of Kansas City from the Missouri River to the Country Club Plaza. Suburban cities such as Independence, Grandview, Lee's Summit, Blue Springs, Gladstone and Liberty have lower average densities, ranging from 6.4 persons per residential acre in Independence to 9.1 persons per residential acre in Blue Springs. **Figure 2.7** shows the area's 2017 population density by census tract.



**Figure 2.7: Planning Area Population Density, 2017**

Source: MARC

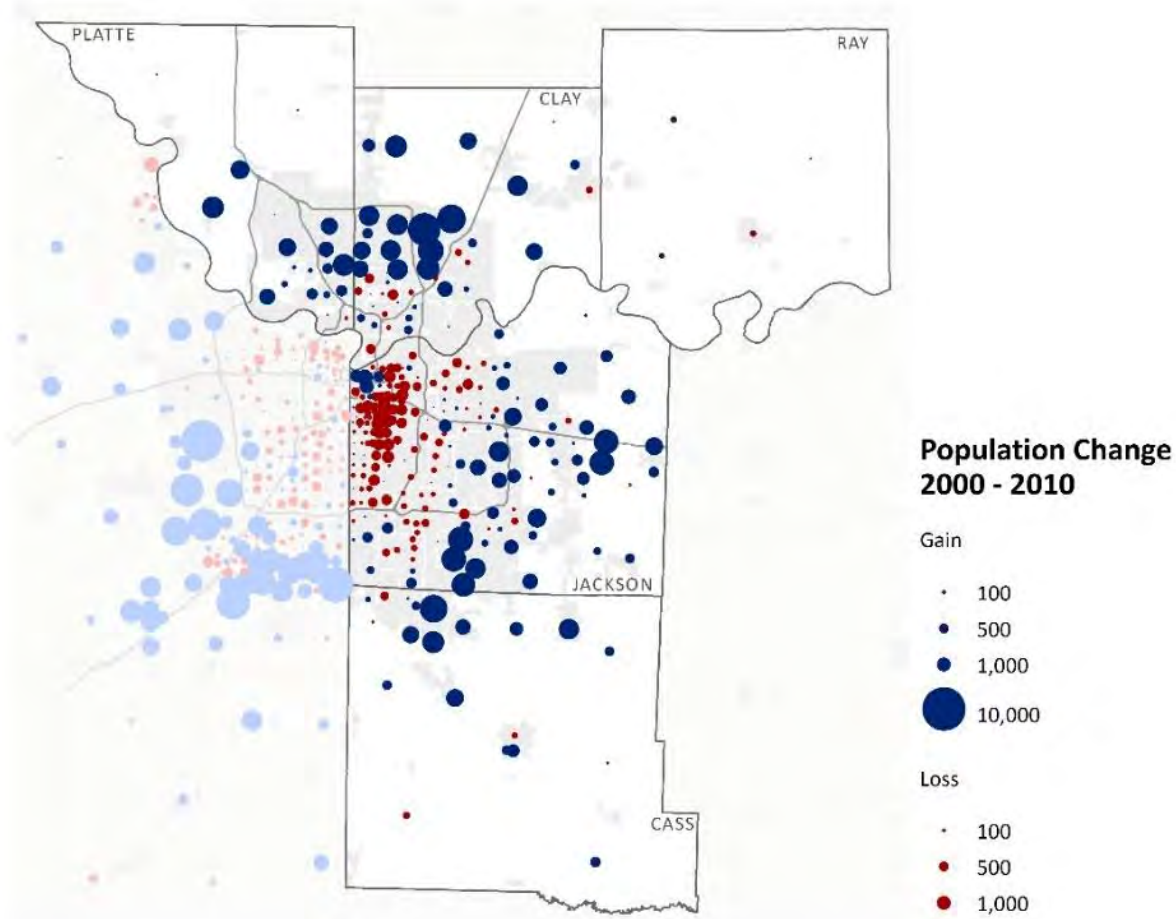
**2.3.2 Population Trends – Total Population**

The population of the nine-county MARC region grew by over 136,000, or seven percent, from 2010 to 2018, from 1,919,089 to 2,055,405 (US Census Bureau, American Community Survey). The planning area accounted for 51 percent of this growth, or 69,103 individuals. The five-county planning area is growing almost as fast as the MARC region as a whole. (Table 2.1).

Table 2.1: Population, 2010-2018					
County	2010	2014	2018	2010-2018 Change	2010-2018 % Change
Cass	99,478	100,889	104,954	5,476	5%
Clay	221,939	233,682	246,365	24,426	10%
Jackson	674,158	683,191	700,307	26,149	4%
Platte	89,322	94,788	102,985	13,663	13%
Ray	23,494	22,949	22,883	-611	-3%
<b>Planning Area</b>	<b>1,108,391</b>	<b>1,135,499</b>	<b>1,177,494</b>	<b>69,103</b>	<b>6%</b>
<i>MARC Region</i>	1,919,089	1,948,195	2,055,405	136,316	7%
<i>Planning area share</i>	58%	58%	57%	51%	88%
Kansas City	460,737	470,678	491,918	31,181	6%

Source: Census Bureau, 2010 decennial census, plus 2014 and 2018 population estimates.

The more suburban counties of Cass, Clay and Platte grew by five percent or more between 2010 and 2018. Clay and Platte grew significantly faster the regional average, with 10 percent and 13 percent, respectively. Clay County gained the most residents – 24,426 residents over the period. However, Platte had the highest percent increase. Cass County’s population growth has slowed significantly since their growth in the early 2000s. However, the county has grown by about 4,000 persons since the 2015 Plan, more than the growth between 2010 and 2014 of about 1,400 residents (US Census Bureau, American Community Survey). Ray County, the region’s most rural county, recorded a slight decline over the period, losing 611 residents.



Source: Census Bureau, 2000 and 2010 decennial censuses

**Figure 2.8: Area Population Change, 2000-2010**

While most of the growth in recent decades has been concentrated in suburban counties, the region’s urban center is experiencing growth in many areas, 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. Still as the region’s largest county, the low rate of growth translates into adding over 26,000 people during the period, the highest level among Missouri side counties.

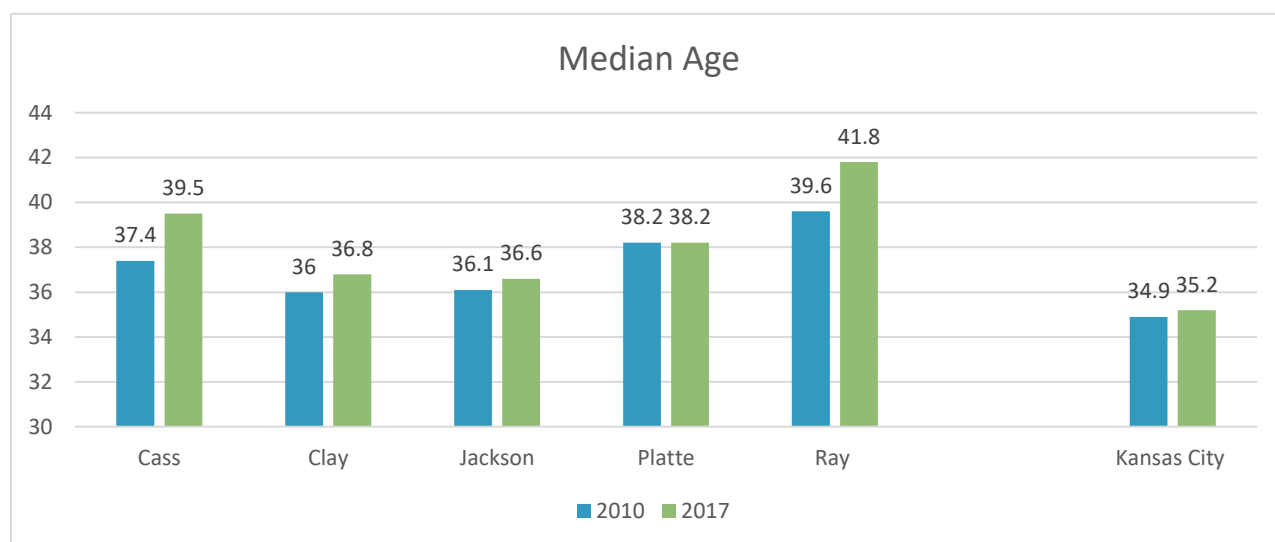
The portions of the planning area experiencing population decline are concentrated in the southeast part of the city of Kansas City, Missouri, south of the Missouri River. However, Kansas City is benefiting from the substantial reinvestment and redevelopment in and around its downtown, which has resulted



in an increase in the population there for the first time in decades. The 2018 population estimates show a six percent increase in Kansas City over the 2010-2018 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 136,316 residents between 2010 and 2018, a seven 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 2017. In the 2015 Plan update, like this update, the American Community Survey was used for subsections 2.3.2 Population by Age and Population by Race and Ethnicity. However, the 2015 Plan showed a 13-year period, 2000-2013. For this Plan update, the data covers a seven-year period, 2010-2017. Table 2.1: Population, 2010-2018, shows the total population as calculated starting in 2010. If this Plan and the 2015 Plan update are compared, values may differ due to changes in the time period duration.



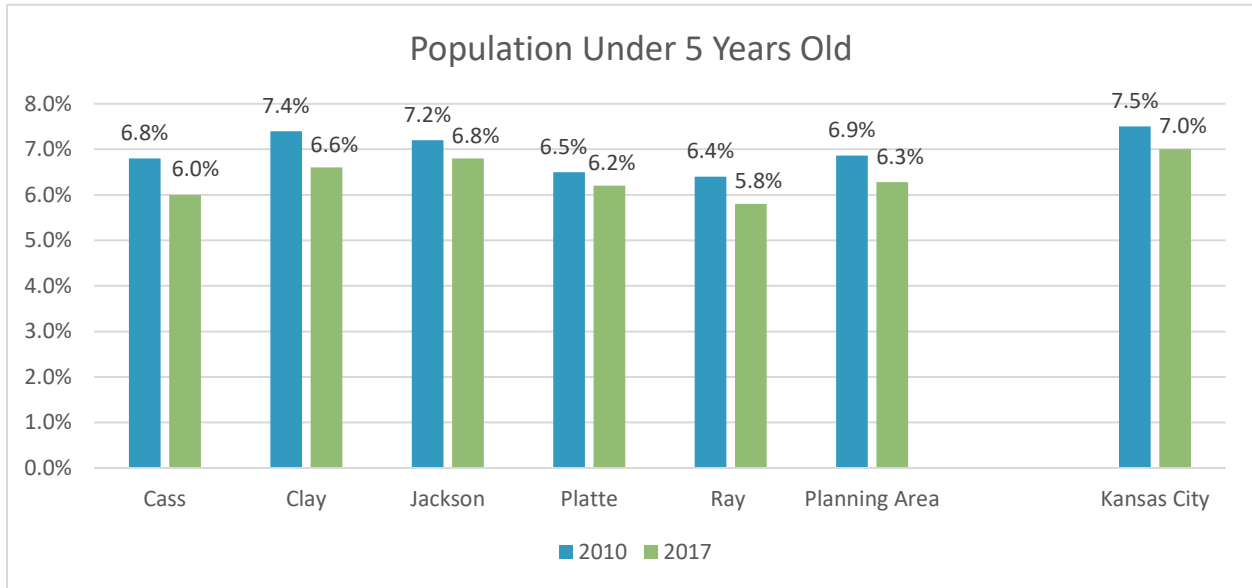
Source: Census Bureau, 2010 - 2017 American Community Survey, 5-year Estimates

**Figure 2.9: Area Population by Median Age, 2010 and 2017**

The aging of the population is part of a long-term, national trend, caused by improvements in life expectancy, an increase in Hispanic families as well as the aging of the post-World War II baby boom population. This is reflected locally by the median age increasing in all counties, except Platte (American Community Survey). Jackson and Clay are the youngest counties, each with a median age around 36.7 years. However, Jackson and Clay experienced modest increases in median age over the 2010 to 2017 period of 0.5 and 0.8, respectively. On the other hand, Ray County's population is the oldest, with a median age of 41.8 years, having increased 2.2 years over the seven-year period. Cass has experienced an increase of 2.1 years, while Platte has remained at 38.2 years over the seven-year period. Meanwhile, the city of Kansas City is the youngest major jurisdiction, with a median age of 35.2 years. The median age of Kansas City's population also increased during the 2010-2017 period, a minor increase of 0.3 years. Changing race and ethnicity of the population played a role in moderating the increase in that county's median age.

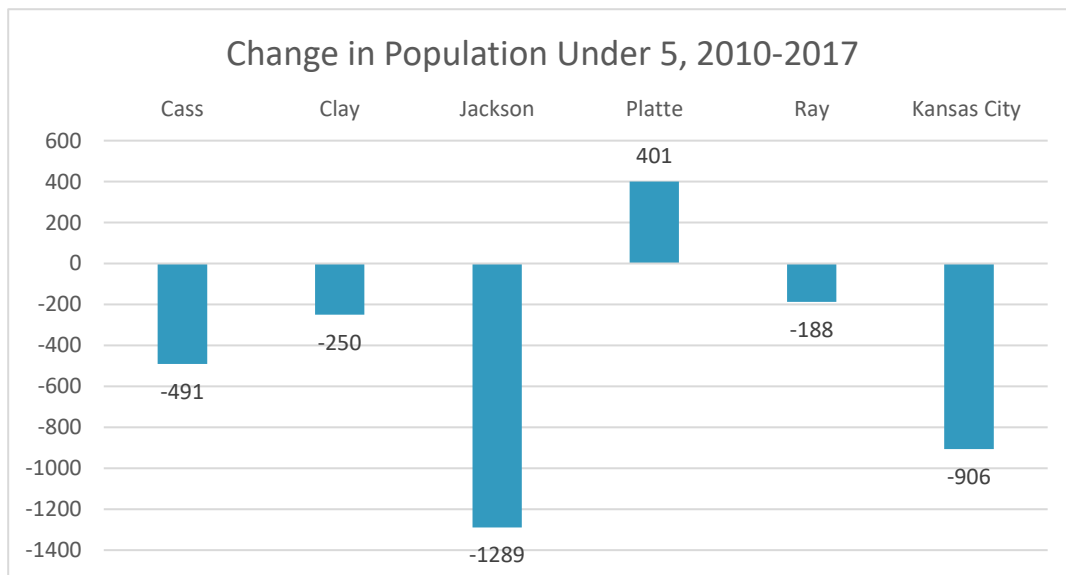


Young children and the elderly are among the region’s most vulnerable populations. As might be expected from its median age, Kansas City has the highest proportion of children under the age of five, at 7.0 percent (See below). However, all jurisdictions have seen a decline in their population under 5 years during the 2010-2017 period. Platte County was the only jurisdiction to see an increase during the period. Jackson County lost the largest number of young persons, decreasing by 1,289 people under the age of 5 from 2010-2017.



Source: Census Bureau, 2010 - 2017 American Community Survey, 5-year

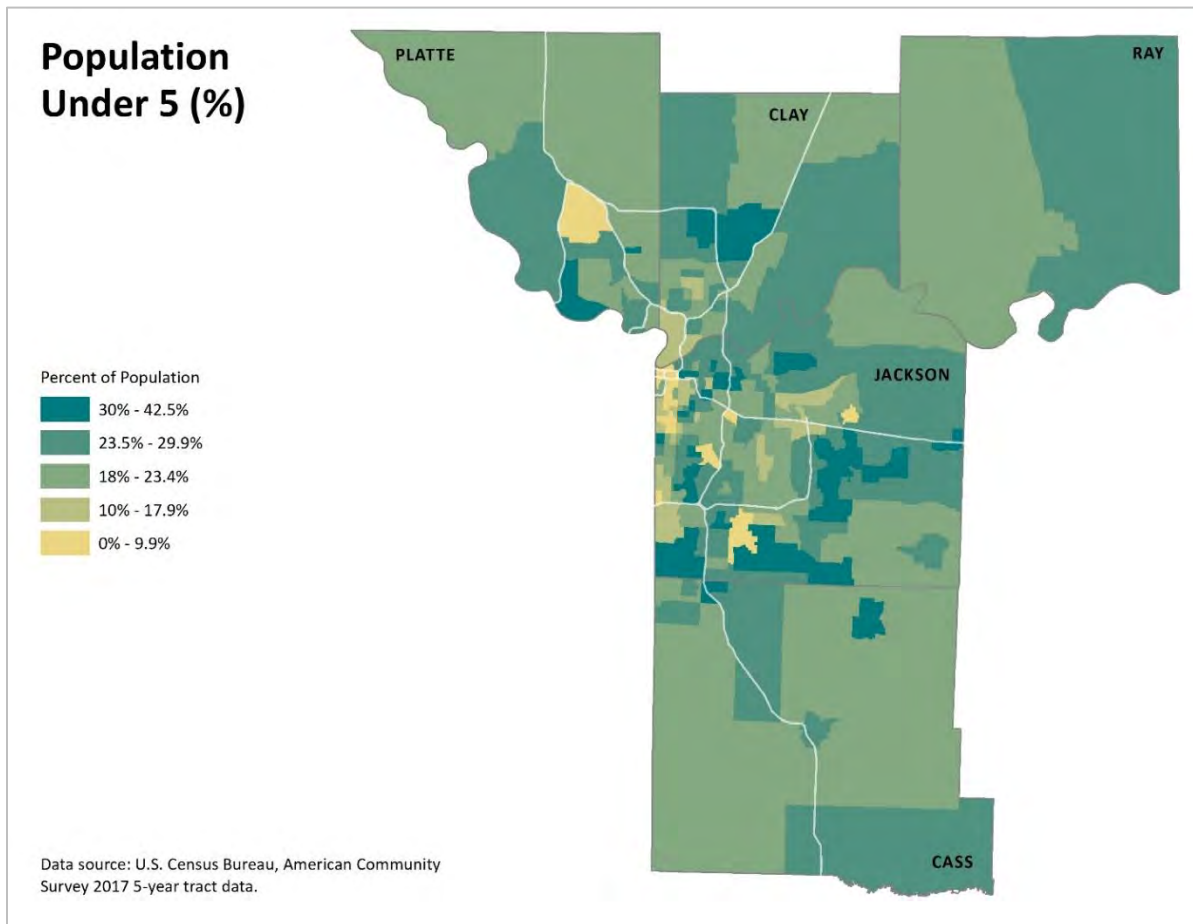
**Figure 2.10: Population Under 5 Years Old, 2010**



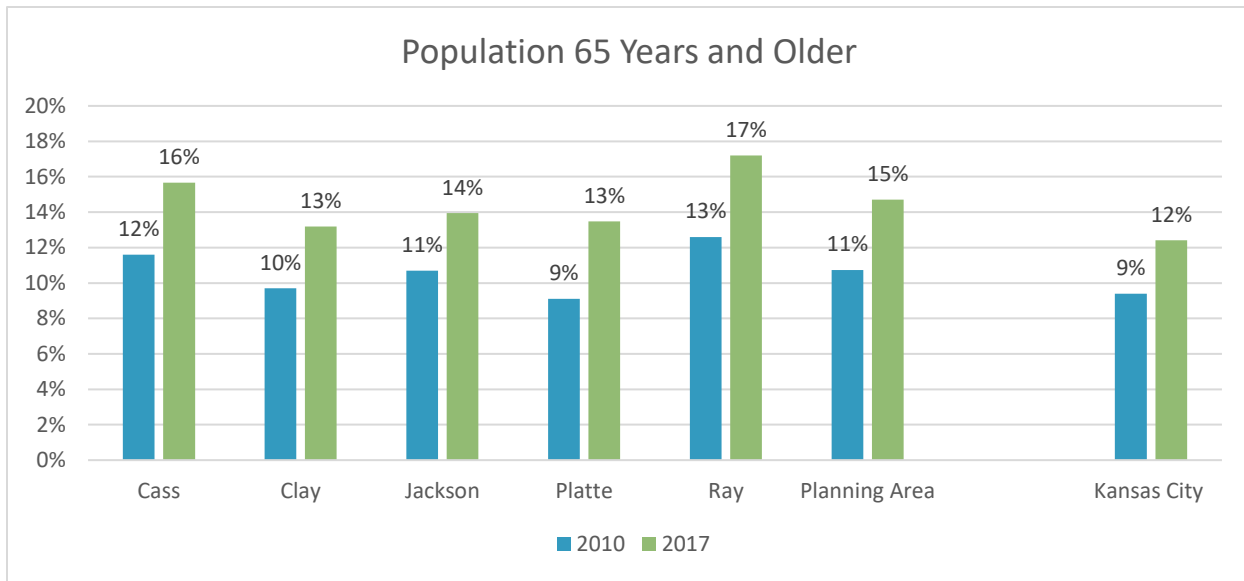
Source: Census Bureau, 2010 - 2017 American Community Survey, 5-year

**Figure 2.11: Change in Population Under 5, 2010-2017**

The population of children under five years old decreased for all counties except Platte. Although the percentage of children under five decreased in Platte, there was still an increase in number of children over the period. All counties except Ray increased their total population but decreased their population under five years old. This reflects the national trend of families having fewer children and older generations living longer. (Source: US Census Bureau, American Community Survey). 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.



**Figure 2.12: Population Below the Age of 5 (%)**

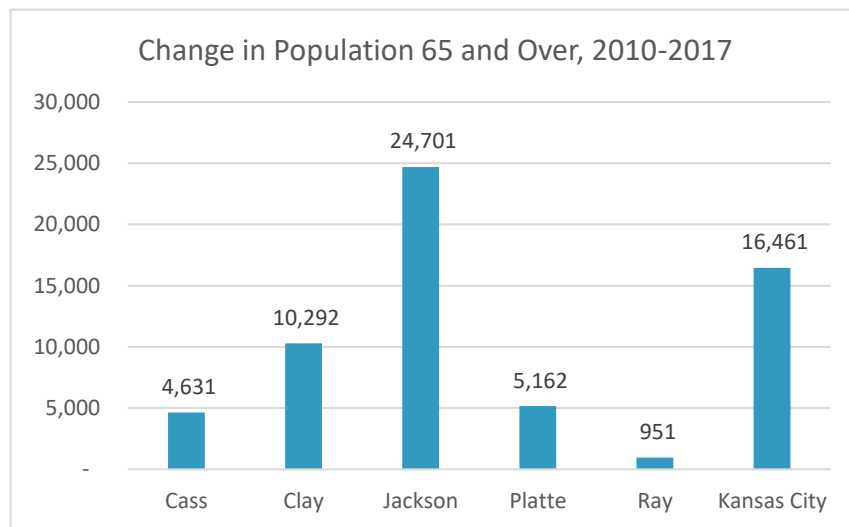


Source: 2010-2017 American Community Survey, 5-year

**Figure 2.13: Population 65 Years and Older, 2010**

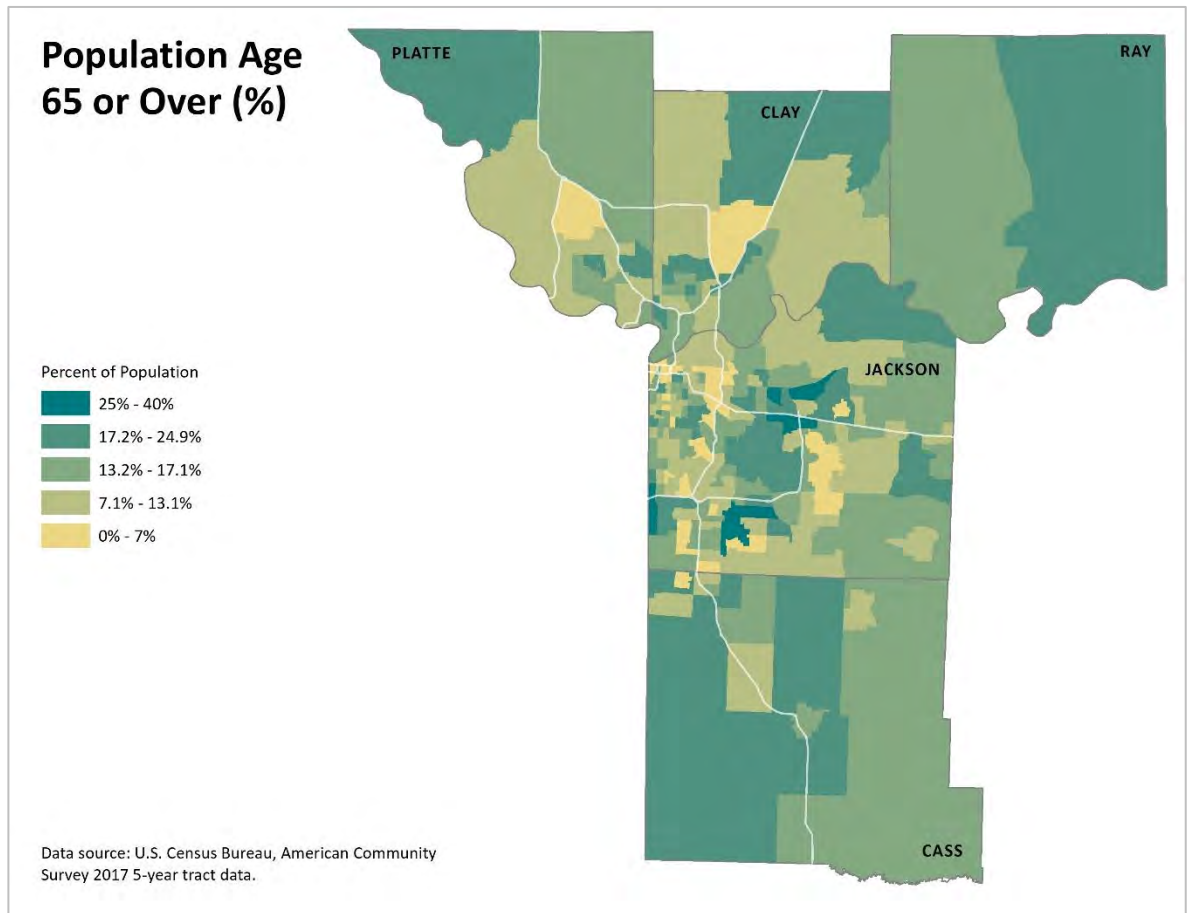
While the more urban counties have the highest proportion of the young, it is the more rural counties of Cass and Ray that have the highest proportion of older adults, with about one in six residents being 65 years or over. Cass, Platte, and Ray all saw the greatest increase in their proportion of seniors, rising four percent in each county. Remaining jurisdictions, Clay, Jackson, and Kansas City increased their senior population by three percent. (Source: US Census Bureau, American Community Survey).

In absolute numbers, Jackson County experienced the greatest increase in its senior population, adding over 24,000 older adults between 2010 and 2017. 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).



Source: 2010 - 2017 American Community Survey, 5-year data

**Figure 2.14: Change in Population 65 and Over, 2010-2017**



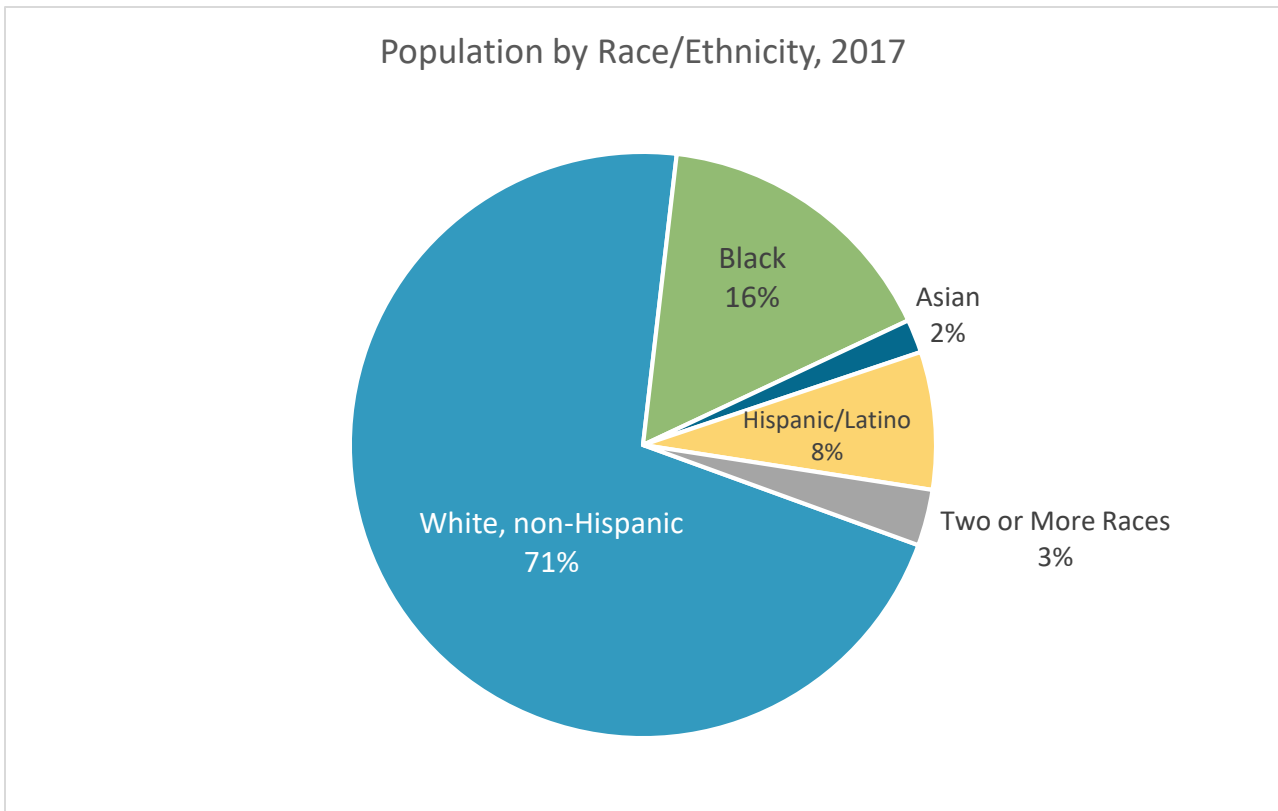
Source: MARC

**Figure 2.15: Population Age 65 and Over (%)**

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

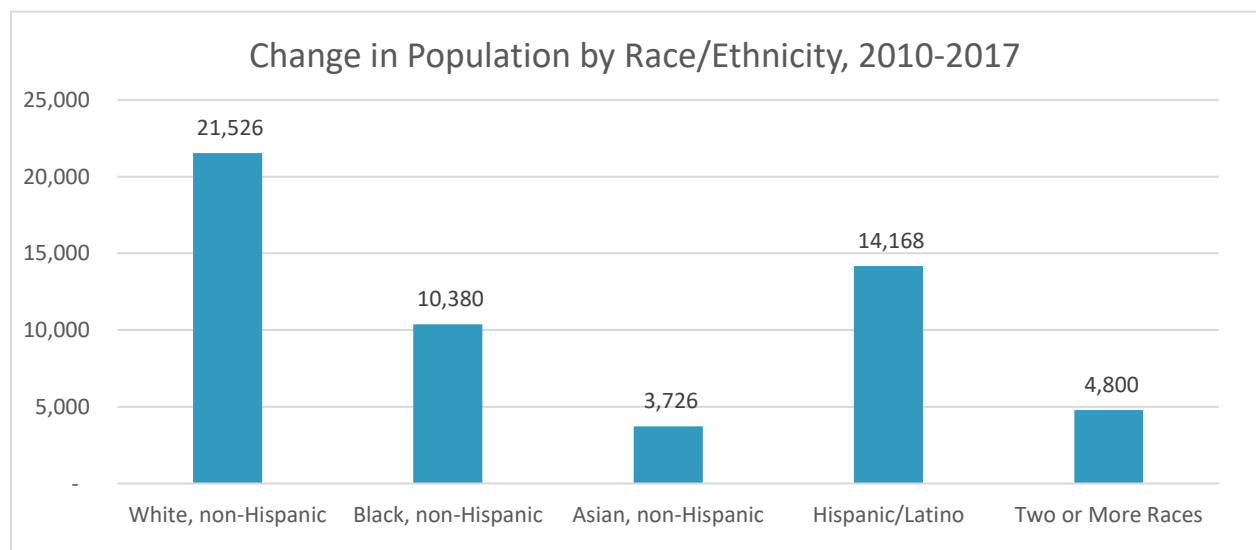
The population of the Planning Area is mostly white, non-Hispanic, accounting for about 815,000 out of the 1.1 million residents, or 71 percent of the total, up from 793,780 in 2010. Black persons make up the next largest racial segment, at 16 percent of the Planning Area's population. Hispanic persons comprise eight percent of the population in the area, with Asians, multi-racial individuals, and other races comprising the remaining five percent. (Source: US Census Bureau, American Community Survey.)



Source: 2010-2017 American Community Survey, 5-year data

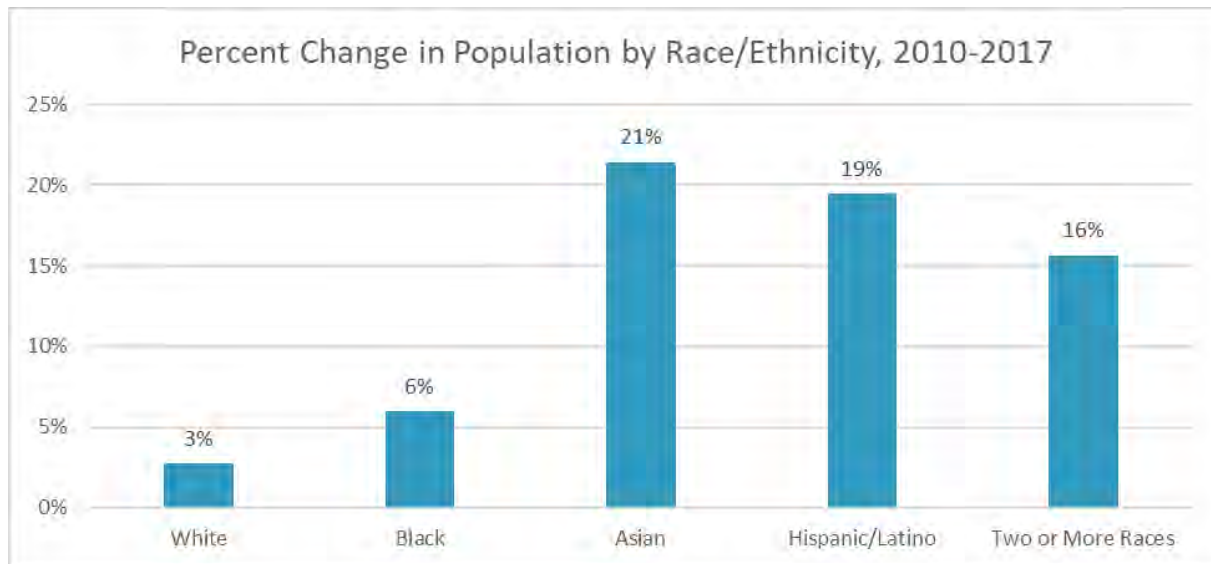
**Figure 2.16: Area Population by Race/Ethnicity, 2017**

The White population grew the most out of any race or ethnic group between 2010 and 2017 in the Planning Area, adding 21,526 people. Hispanics/Latinos grew by 14,168 while Blacks grew 10,380. While the Asian population’s absolute growth was relatively small, the 3,700 additional Asian individuals added to the region since 2010 represented a 21 percent increase over its base of around 21,000.



Source: 2017 American Community Survey, 5-year data

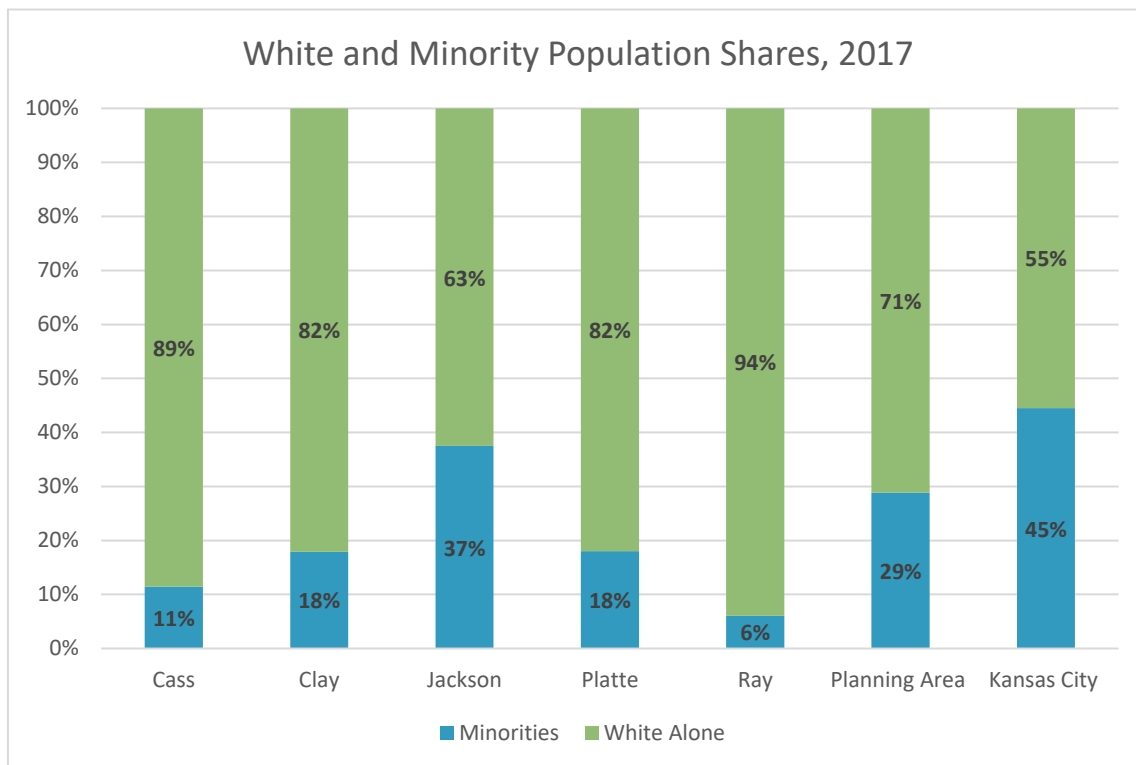
**Figure 2.17: Change in Population by Race/Ethnicity, 2010-2017**



Source: 2010-2017 American Community Survey, 5-year data

**Figure 2.18: Percent Change in Population by Race/Ethnicity, 2010-2017**

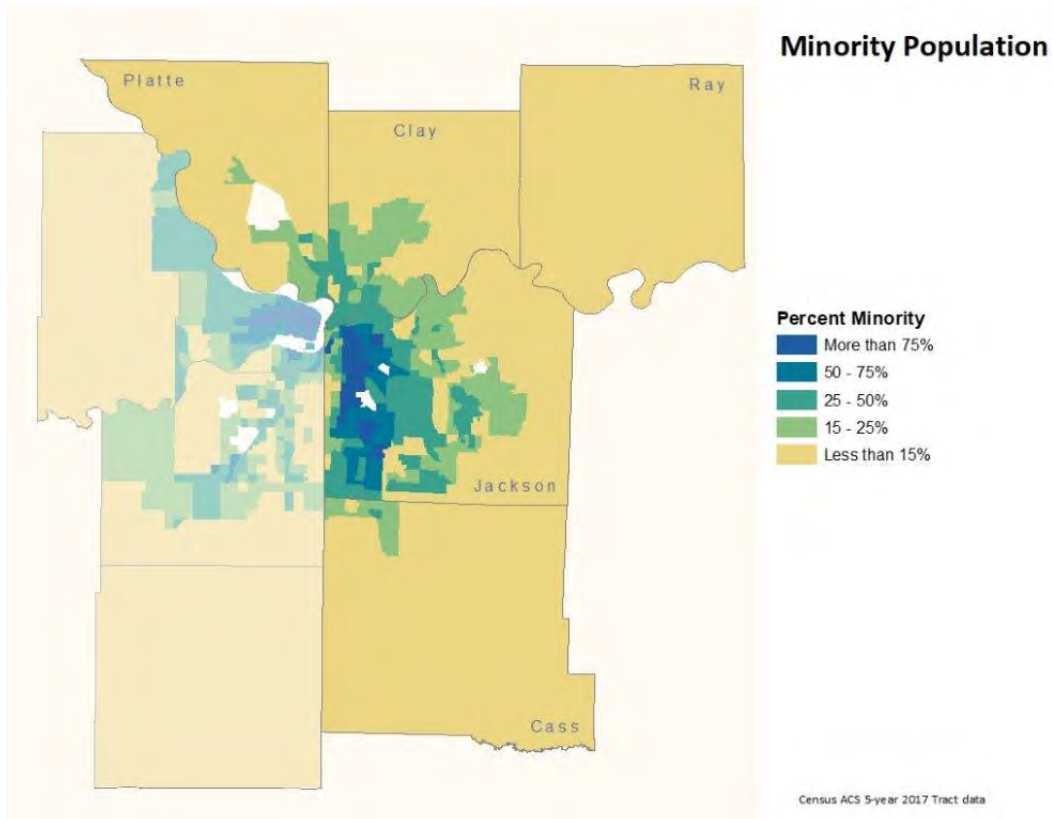
Forecasts of the region’s population by race and ethnicity suggest that if the minority population continues to grow faster than the White population, then at some point the Planning Area may become majority minority. The Kansas City, Missouri, minority population is 45 percent of the total population. 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 94 percent and Cass County’s is 89 percent. (Source: US Census Bureau, American Community Survey)



Source: 2017 American Community Survey, 5-year

**Figure 2.19: White and Minority Population Shares, 2017**

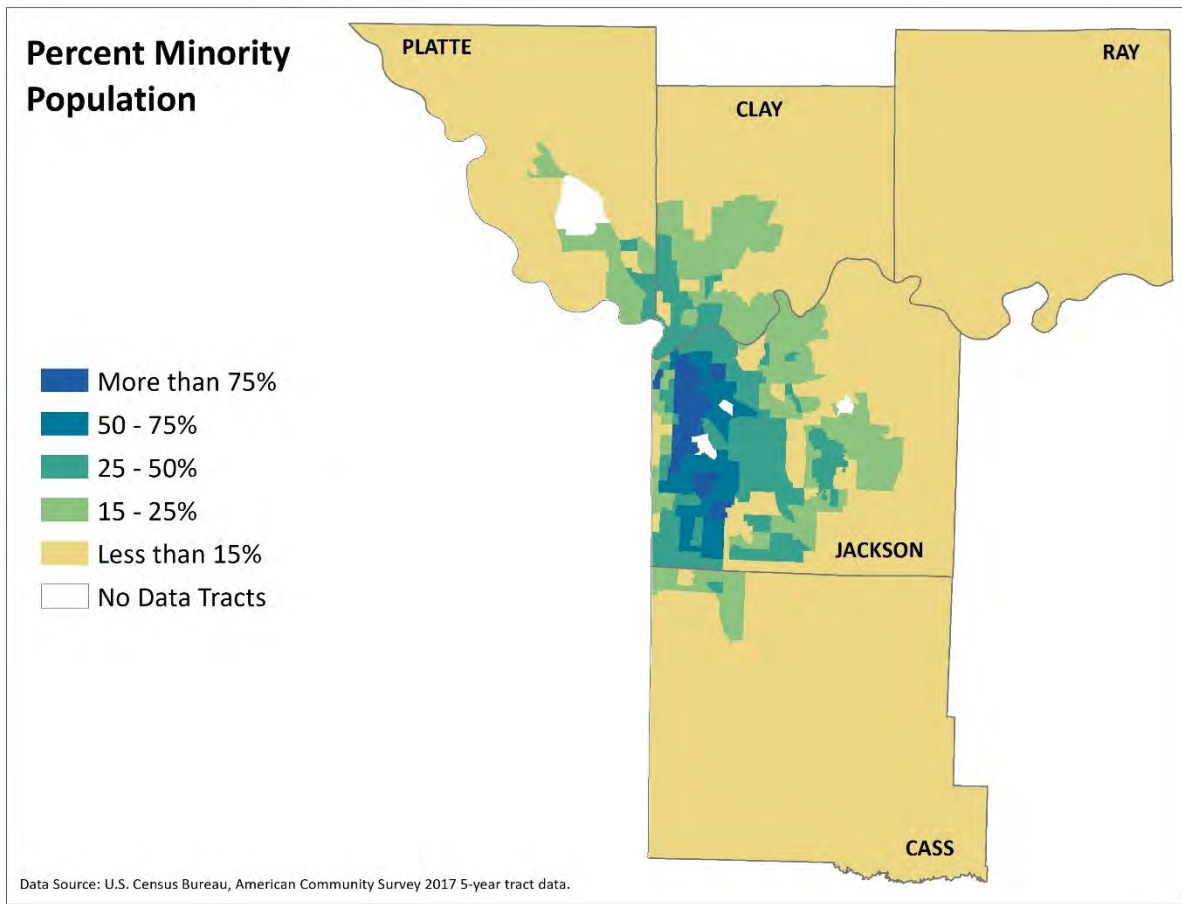
While Kansas City has the largest concentration of minorities, they are not spread uniformly throughout the city. The minority population, particularly the black population is concentrated east of Troost Avenue, the historic racial dividing line due to legally sanctioned racial practices prior to the 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 and other minorities concentrated to the east of it in the portion of Kansas City that is in Jackson County.



Source: US Census Bureau, American Community Survey 2017

**Figure 2.20: Minority Population 2010-2017 (%)**

Not all minorities are distributed similarly. While the central portion of Kansas City where minorities are most concentrated is largely African American, Hispanic persons are more dispersed, with some concentrations in the northeast Kansas City area, and, to a lesser extent, to the south in Grandview.

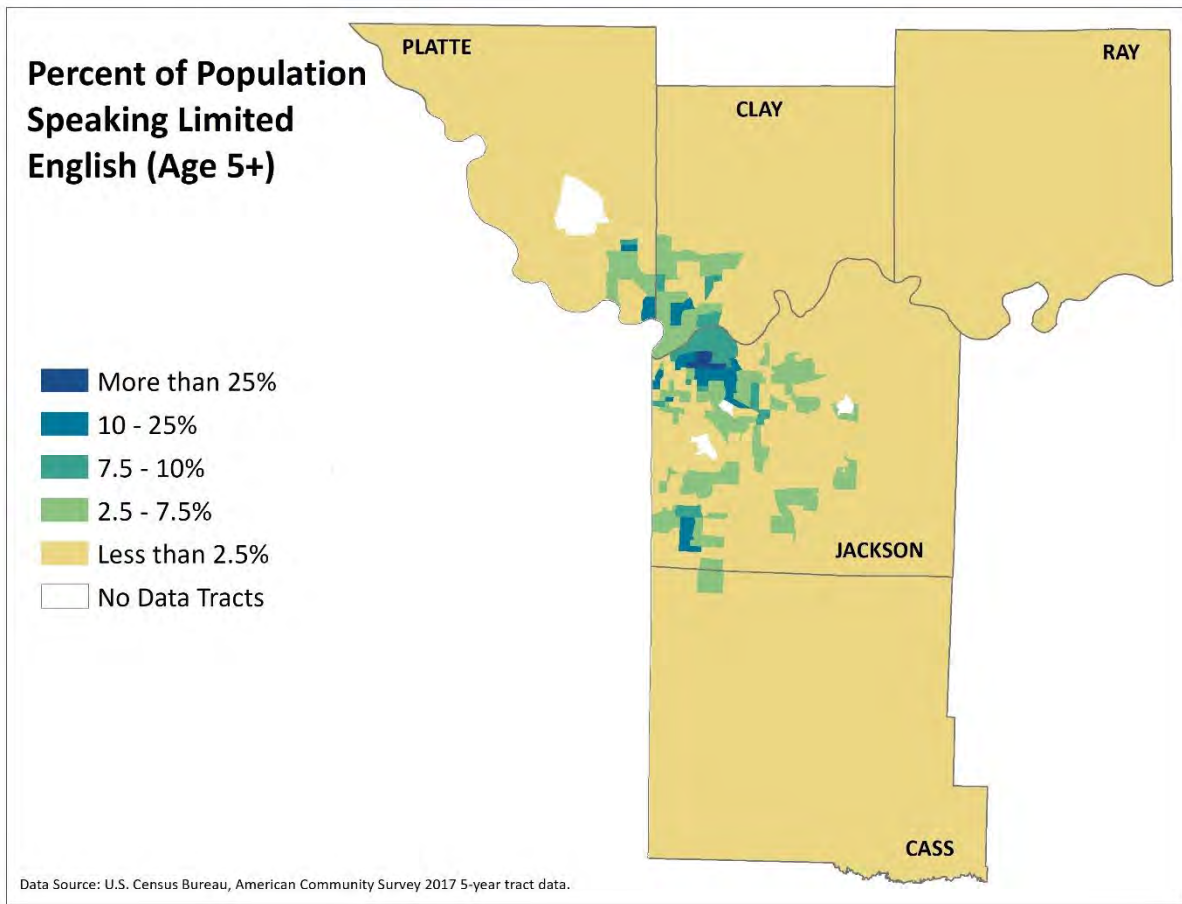


Source: American Community Survey 2017

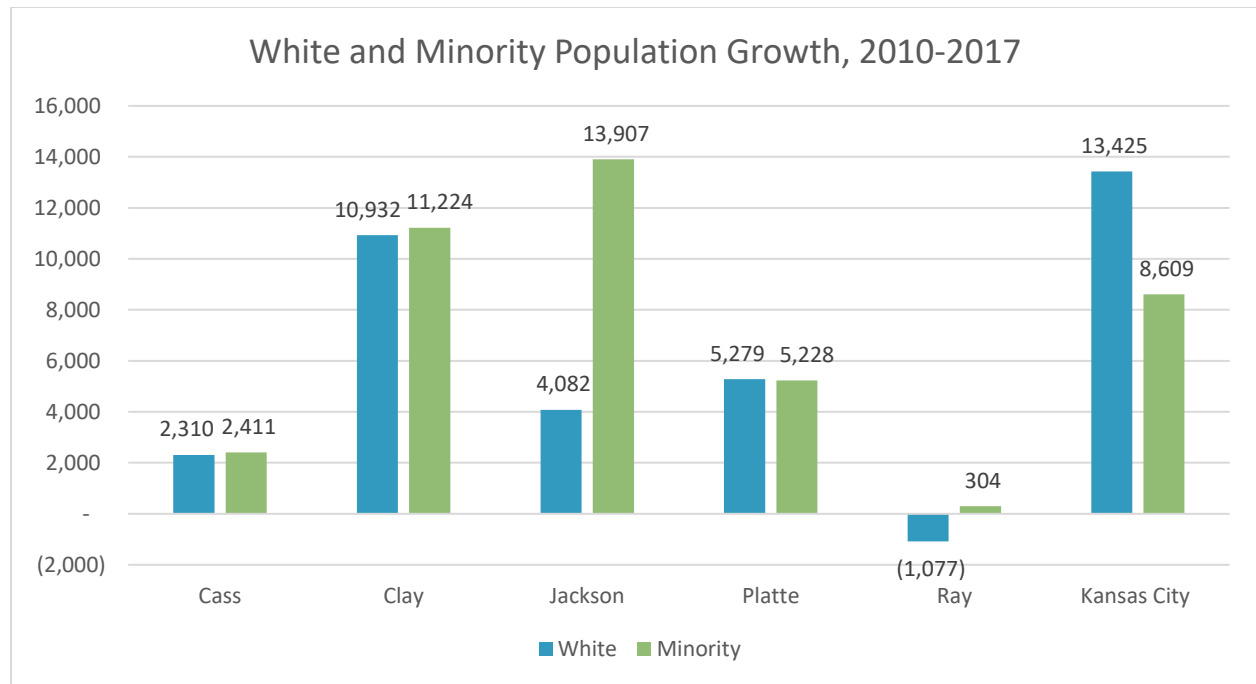
**Figure 2.21: Hispanic Population (%)**

The concentration of Hispanic persons mirrors closely the distribution of those who are not proficient speaking English. The most prevalent language spoken in the planning area other than English is Spanish.





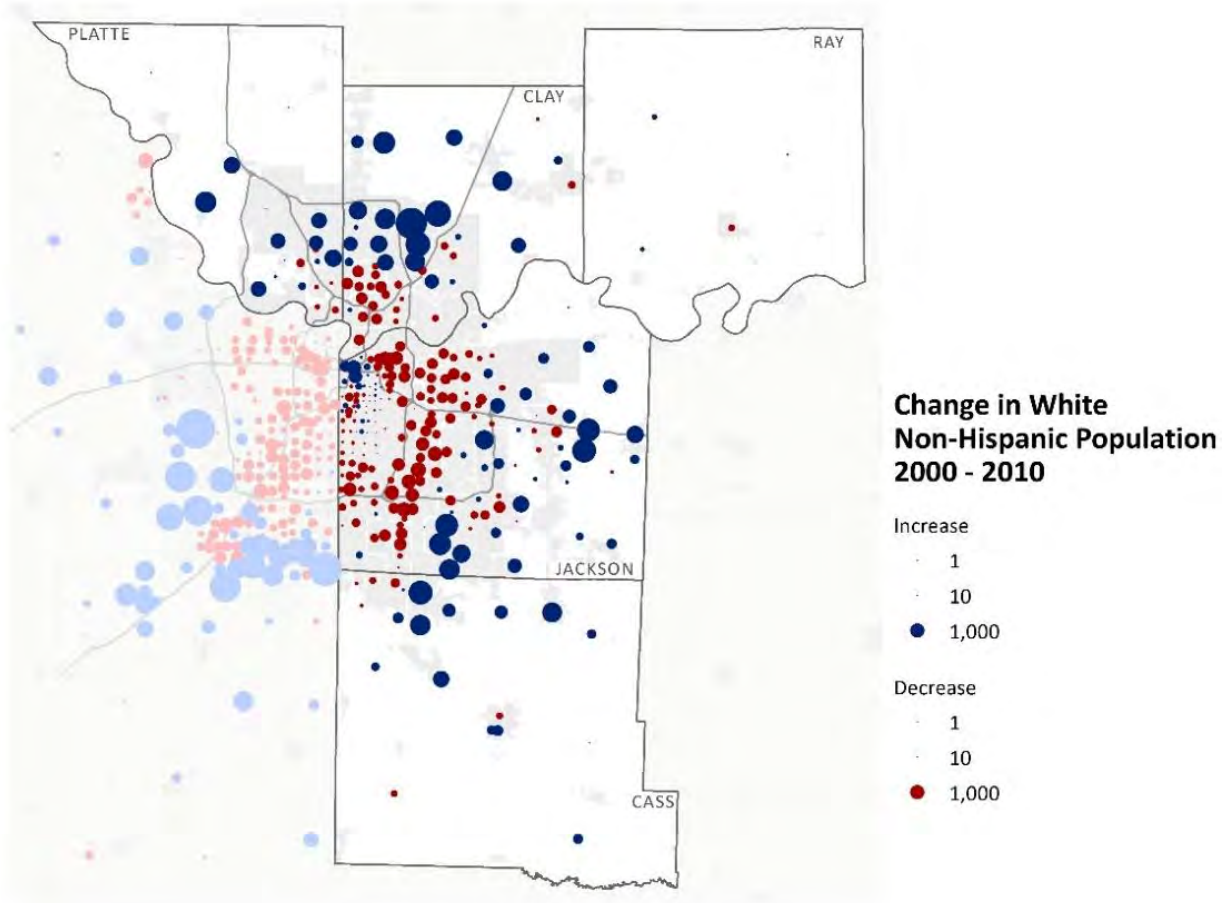
**Figure 2.22: Population Speaking English Less than 'Very Well' (%)**



Source: 2000 Census and 2013 American Community Survey, 5-year data

**Figure 2.23: White and Minority Population Growth, 2010-2017**

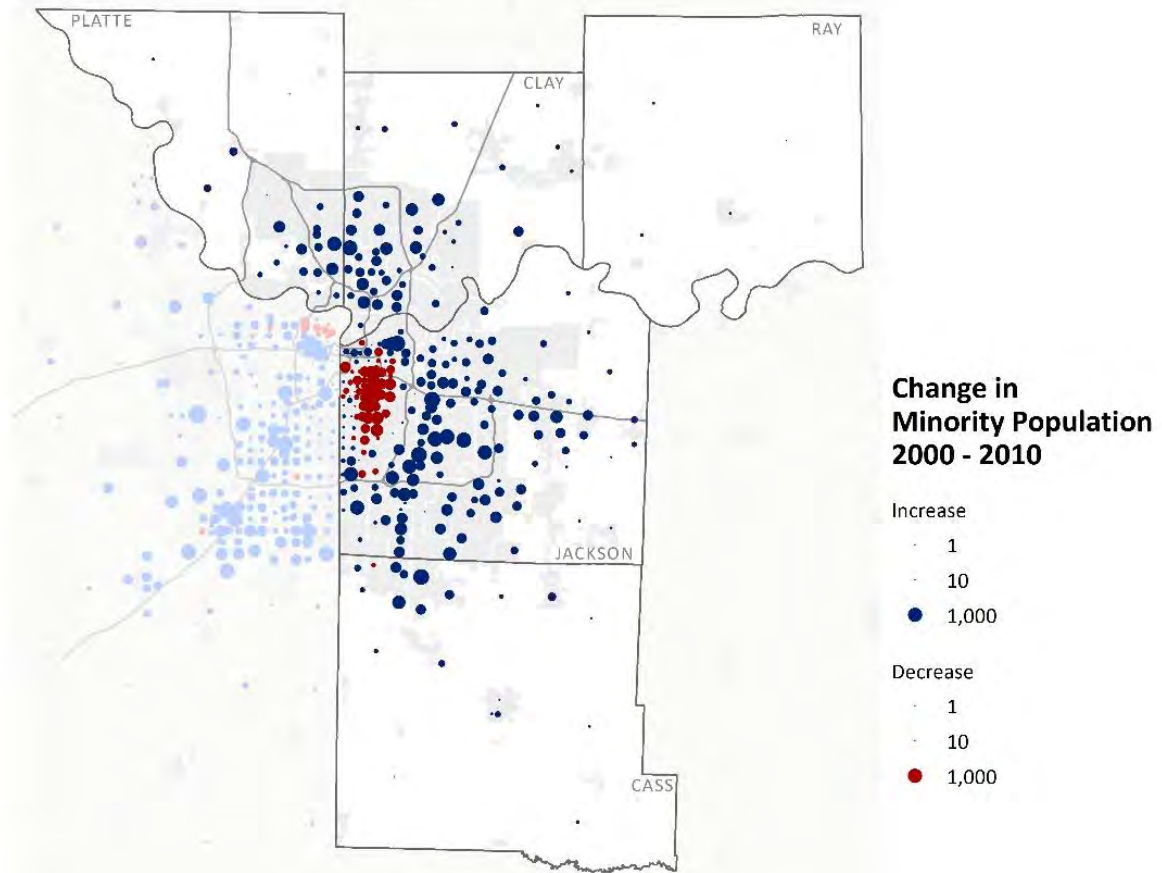
Overall, the white population growth was smaller in comparison with minorities between 2010 and 2017. Cass, Clay, and Platte counties saw similar growth between whites and minorities during the seven-year period (**Figure 2.23**). In Jackson County, minorities accounted for around 80 percent of the population 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.



Source: Census Bureau, 2000 and 2010 decennial censuses

**Figure 2.24: Change in White Non-Hispanic Population 2000-2010**

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).

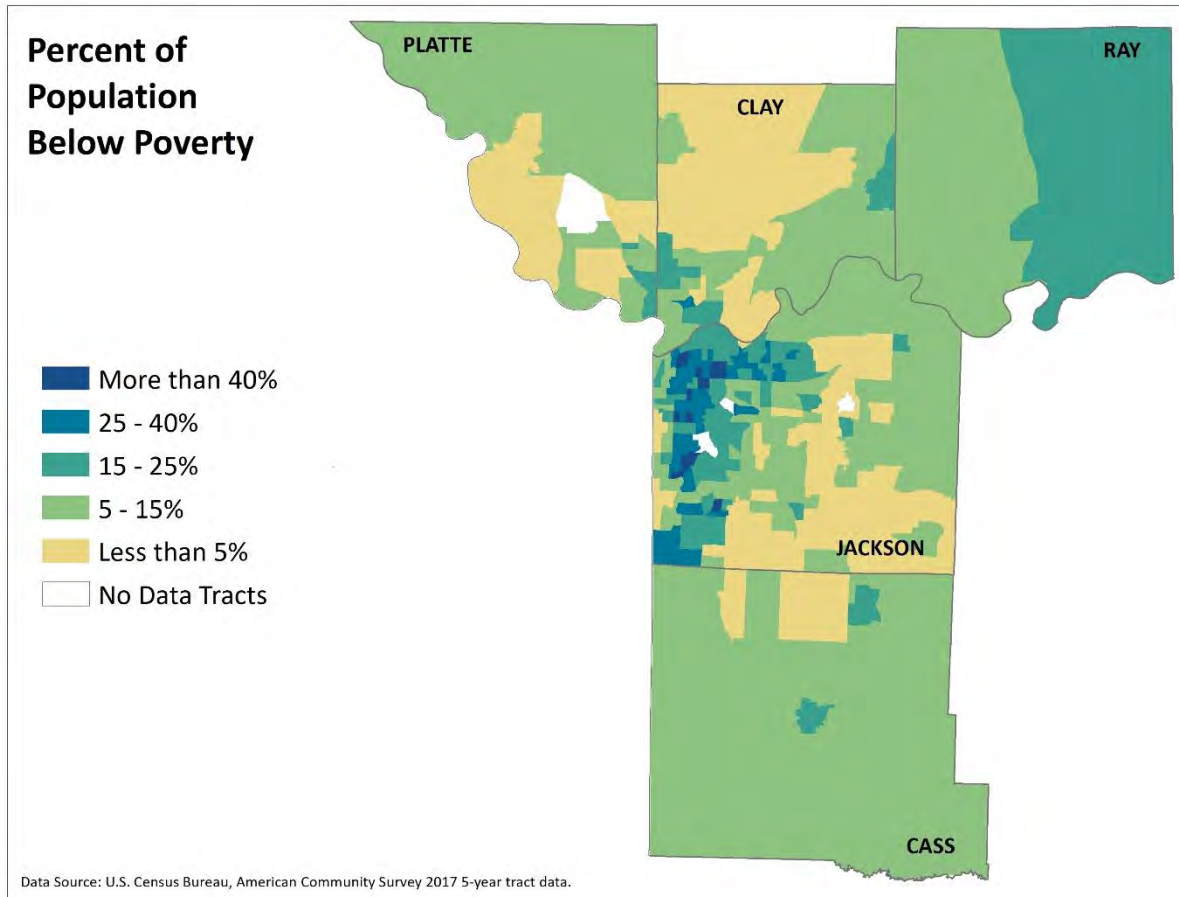


Source: Census Bureau, 2000 and 2010 decennial censuses

**Figure 2.25: Change in Minority Population, 2000-2010**

**2.3.5 Poverty**

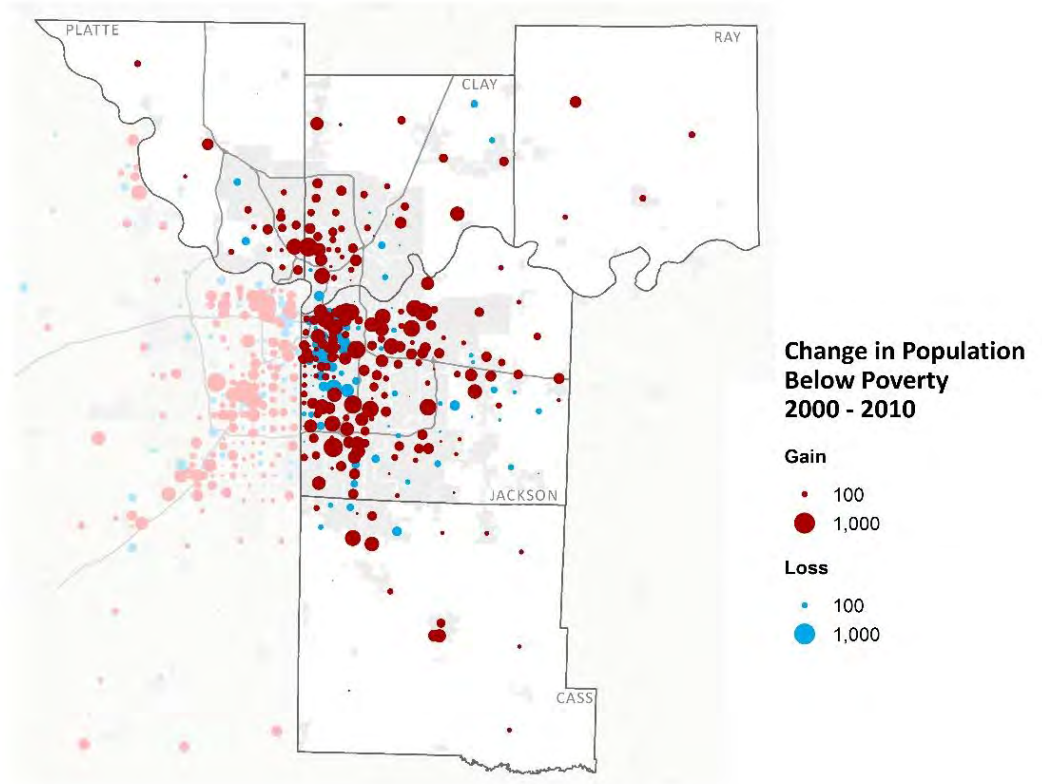
There is a strong correlation between concentrations of minorities and concentrations of poverty. In part, population loss is the result of the loss of families and an increase in the number of vacant dwellings in many urban core neighborhoods. This population loss has led to a disinvestment in properties and a loss of job opportunities for residents.



Source: 2017 American Community Survey, 5-year data

**Figure 2.26: Population Below Poverty (%)**

The region's poor households are found in almost every city and county in the Kansas City region, 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 inadequate or expensive heating and cooling systems.

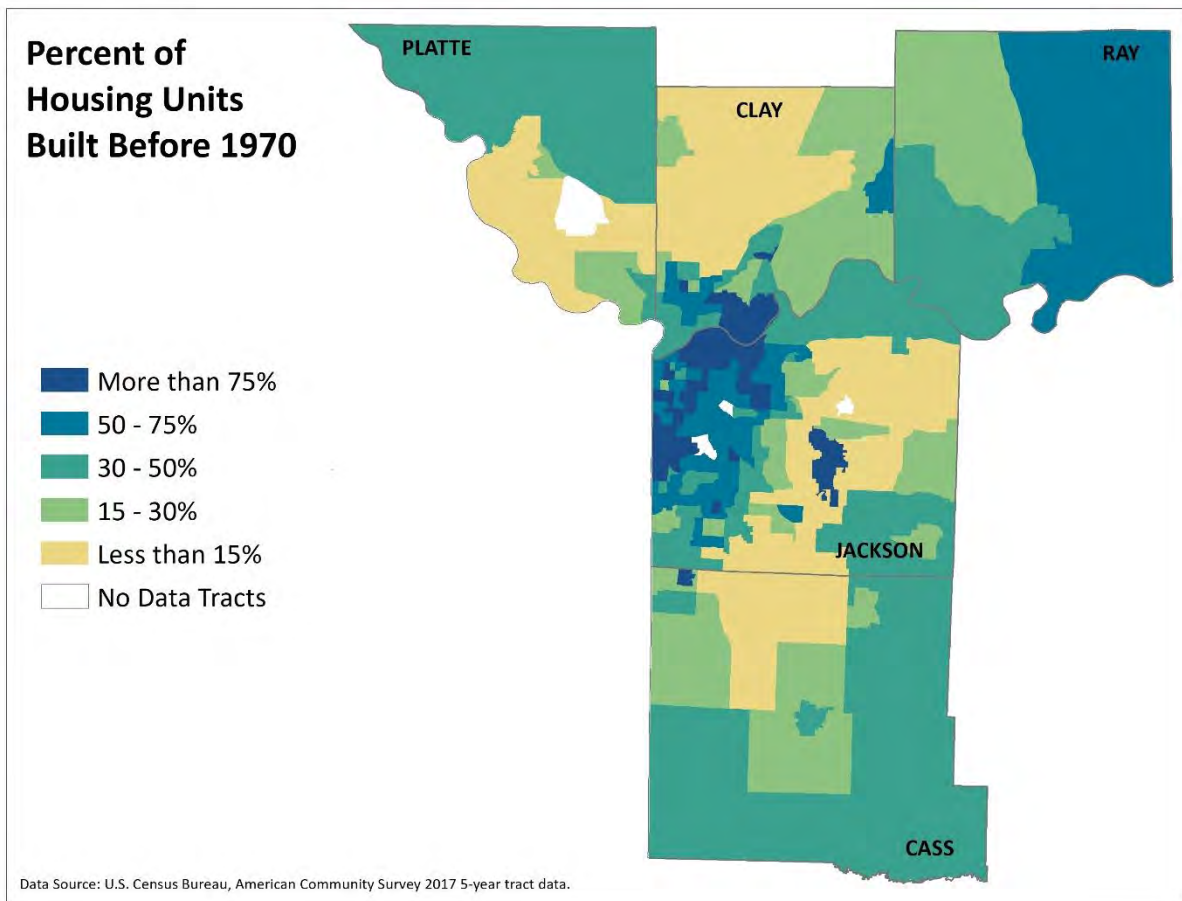


Source: US Census Bureau, Decennial Census

**Figure 2.27: Change in Population Below Poverty, 2000-2010**

While poverty remains the most concentrated in the Jackson County portion of Kansas City, the growth of households in poverty has occurred throughout the Planning Area. Ray County has experienced an increase of 6.2 percent in the number of persons in poverty, the largest increase for any county in the planning area. Cass and Clay both showed increases of persons in poverty by 2.3 percent and 1.1 percent, respectively, while Jackson and Platte had a modest 0.2 percent increase in poverty over the period.





**Figure 2.28: Housing Units Built before 1970 (%)**

Households with limited incomes often reside in neighborhoods with older housing units. Figure 2.29 shows those areas with larger proportions of housing units that were built prior to 1970.

	2010			2017			Change		
	Total Population	Population Below Poverty	Poverty Rate	Total Population	Population Below Poverty	Poverty Rate	Total Population	Population Below Poverty	Poverty Rate
Cass	96,563	6,940	7.2%	100,427	9,492	9.5%	3,864	2,552	2.3%
Clay	211,853	16,585	7.8%	232,843	20,693	8.9%	20,990	4,108	1.1%
Jackson	657,567	103,423	15.7%	677,650	108,026	15.9%	20,083	4,603	0.2%
Platte	85,939	6,055	7.0%	95,707	6,936	7.2%	9,768	881	0.2%
Ray	23,405	2,196	9.4%	22,581	3,527	15.6%	(824)	1,331	6.2%
Planning Area	1,075,327	135,199	12.6%	1,129,208	148,674	13.2%	53,881	13,475	0.6%
Kansas City	433,743	80,072	18.5%	468,355	81,069	17.3%	34,612	997	-1.2%

Source: 2010 and 2017 ACS, 5-year data. Universe is persons for whom poverty data is available.

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. Other vulnerable populations are more spread throughout the Planning Area, including the disabled and veterans. **Attachment Maps 2.1-2.6** showing the location of these vulnerable populations may be found in section **2.8 Attachments**.

## 2.4 Planning for the Future

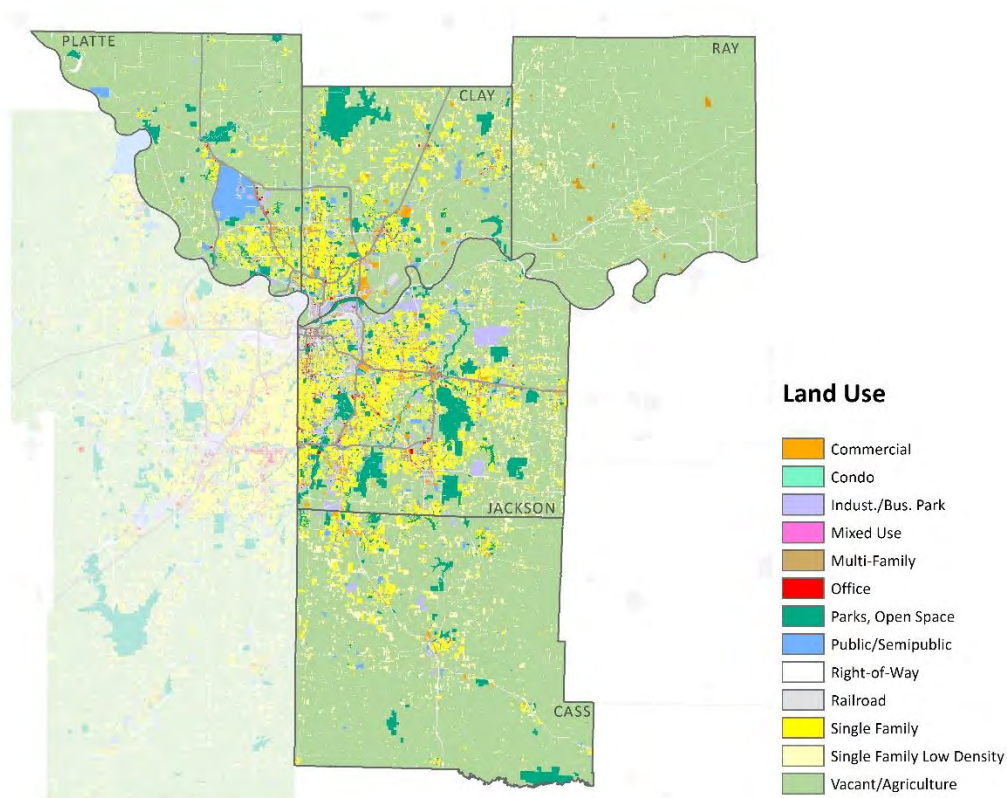
### 2.4.1 Land Use

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 activity as given by the region's current land use (Source: MARC).

<b>Land Use</b>	<b>Cass</b>	<b>Clay</b>	<b>Jackson</b>	<b>Platte</b>	<b>Ray</b>	<b>Total</b>
Single Family	15,963	27,942	61,856	12,018	1,668	119,446
Single Family (low density)	23,372	11,527	21,609	5,298	11,269	73,075
Multi-Family	339	1,443	5,276	672	-	7,730
Mixed use	-	-	11	-	-	11
Commercial	2,047	6,483	9,993	1,135	1,716	21,374
Office	36	764	2,306	441	-	3,546
Industrial/Business Park	1,878	2,418	17,014	1,821	-	23,132
Public/Semipublic	3,087	7,022	10,354	13,452	9	33,924
ROW	9,333	21,106	45,554	16,133	-	92,127
Parks and Open Space	11,683	21,941	38,056	9,392	-	81,073
Vacant or Agricultural	381,775	159,114	182,986	212,112	337,837	1,273,854
<b>Total</b>	<b>449,514</b>	<b>259,789</b>	<b>395,015</b>	<b>272,474</b>	<b>352,499</b>	<b>1,729,292</b>

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 2.29: Area Land Use**

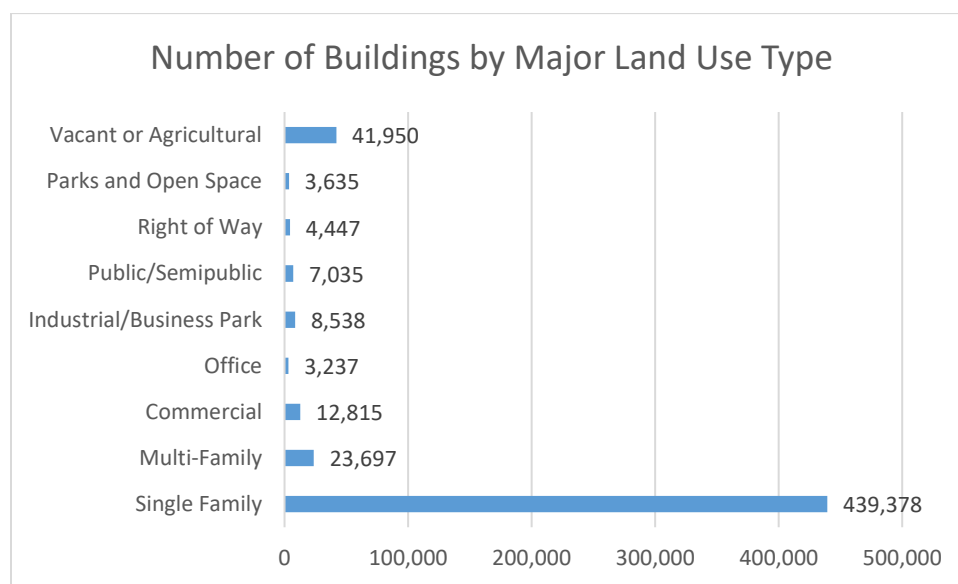
Vacant or agricultural land is still the dominant land use in the Planning Area, comprising two-thirds of the total land area. Adding parks and open space to this total, more than three-quarters (78 percent) of the Planning area is undeveloped. This varies by county, from Ray and Cass counties, with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

Given its relative share of developed land uses, single-family homes dominate the structure count, comprising 81 percent of the total structures in the Planning Area (**See Table 2.4**).

Land Use Type	Cass	Clay	Jackson	Platte	Total
Single Family	41,060	88,812	277,991	31,515	439,378
Multi-Family	1,695	3,003	17,620	1,379	23,697
Commercial	1,521	2,418	8,162	714	12,815
Office	20	614	2,366	237	3,237
Industrial/Business Park	299	1,214	6,450	575	8,538
Public/Semipublic	846	1,498	3,814	877	7,035
Right-of-Way	323	768	3,037	319	4,447
Parks and Open Space	250	1,031	1,991	363	3,635
Vacant or Agricultural	12,450	8,281	14,516	6,703	41,950
<b>Total</b>	<b>58,464</b>	<b>107,639</b>	<b>335,947</b>	<b>42,682</b>	<b>544,732</b>

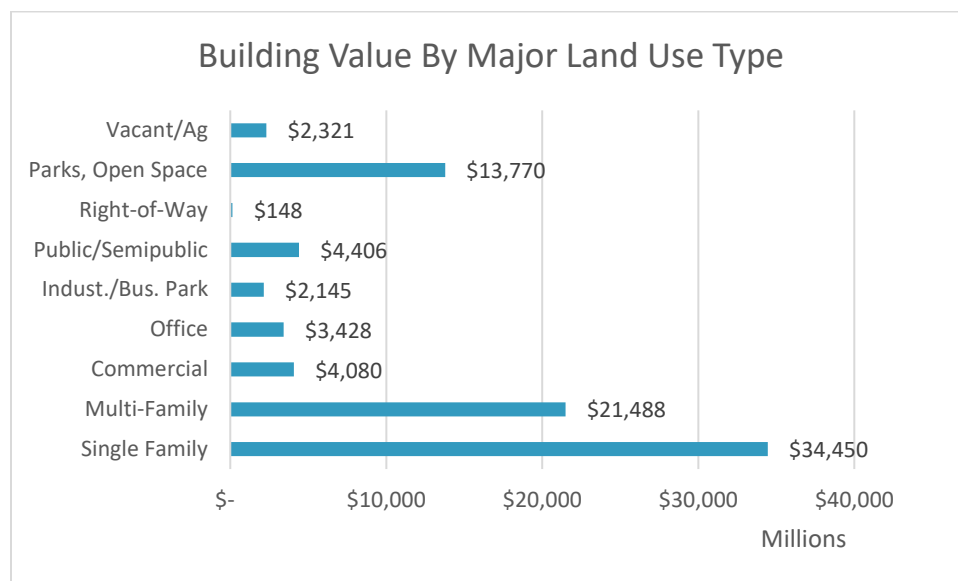
Source: City and County GIS departments and MARC. Ray County data not available.



Source: City and County GIS departments and MARC

**Figure 2.30: Number of Buildings by Major Land Use Type**

A different picture emerges when considering the value of the buildings in the planning area by land use type. **See Figure 2.30 Number of Buildings by Major Land Use Type.** The share of total building value attributed to single family structures drops to 40 percent, which is half its share of building counts. Multi-family buildings comprise one quarter of the building value in the planning area. This is followed by the value of buildings in public parks. That 16 percent of the total building value of the planning area is located in parks likely reflects recent investments in the Kansas City Zoo. Public/semi-public buildings such as schools and churches, as well as commercial buildings, each account for five percent of the planning area’s building value, while industrial buildings account for four percent. **(See Figure 2.31 and Table 2.5).**



Source: County assessors, city and county Planning and GIS departments, as compiled and tabulated by MARC. Ray County data not available.

**Figure 2.31: Building Value by Major Land Use Type**

Land Use	Cass	Clay	Jackson	Platte	Total
Single Family	\$ 3,325,998,111	\$ 8,110,982,200	\$ 18,934,960,384	\$ 4,078,456,625	\$ 34,450,397,320
Multi-Family	\$ 178,858,860	\$ 717,891,400	\$ 20,135,850,790	\$ 455,837,064	\$ 21,488,438,114
Commercial	\$ 274,966,390	\$ 1,335,636,800	\$ 1,869,600,550	\$ 600,171,176	\$ 4,080,374,916
Office	\$ 10,452,940	\$ 342,355,200	\$ 2,797,491,554	\$ 277,492,272	\$ 3,427,791,966
Industr./Bus. Park	\$ 47,728,970	\$ 411,122,320	\$ 1,387,706,985	\$ 298,828,690	\$ 2,145,386,965
Public/Semipublic	\$ 20,762,520	\$ 965,717,555	\$ 2,705,674,554	\$ 714,317,378	\$ 4,406,472,007
Right-of-Way	\$ 1,145,180	\$ 2,403,600	\$ 142,432,839	\$ 1,695,872	\$ 147,677,491
Parks, Open Space	\$ 11,183,620	\$ 50,737,400	\$ 13,693,093,231	\$ 15,179,567	\$ 13,770,193,818
Vacant/Ag	\$ 432,878,262	\$ 297,358,604	\$ 1,329,394,183	\$ 261,774,696	\$ 2,321,405,745
<b>Total</b>	<b>\$ 4,303,974,853</b>	<b>\$ 12,234,205,079</b>	<b>\$ 62,996,205,070</b>	<b>\$ 6,703,753,340</b>	<b>\$ 86,238,138,342</b>

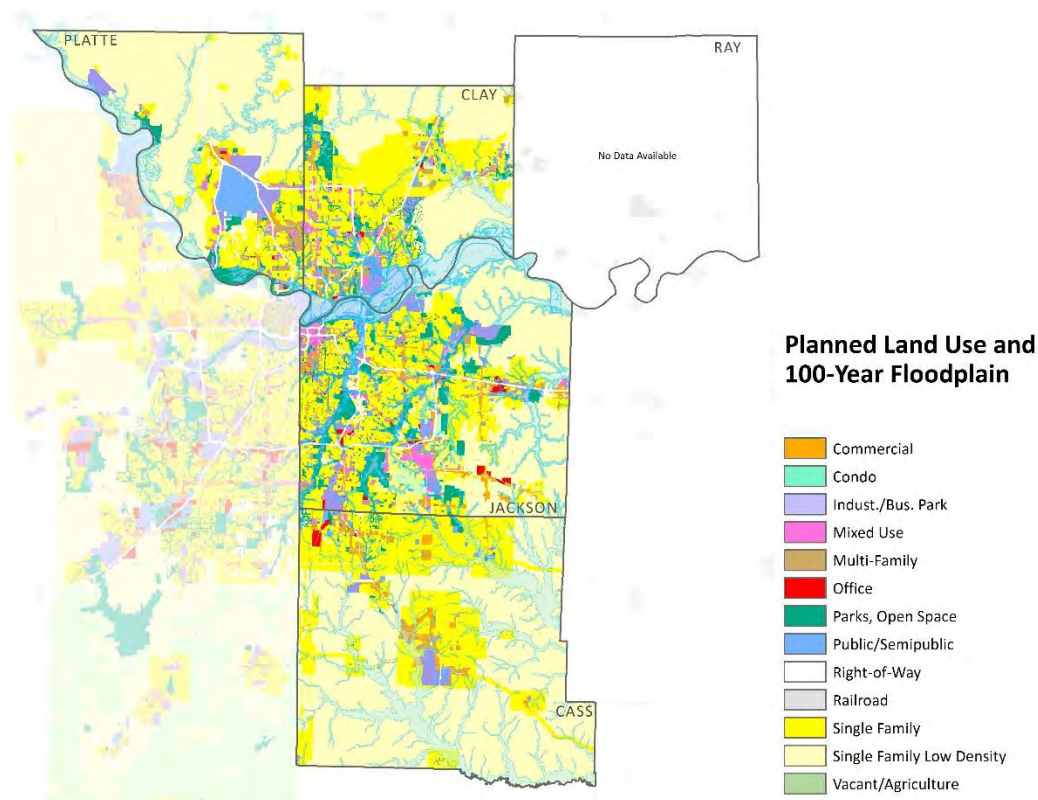
Source: County assessors, city and county Planning and GIS departments, as compiled and tabulated by MARC. Ray County data not available.

**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 2.6).

Table 2.6: Planned Land Use by Major Type, in acres					
Land Use (in acres)	Cass	Clay	Jackson	Platte	Total
Single Family	127,985	92,455	166,281	43,538	430,259
Single Family (low density)	279,118	99,746	92,374	180,870	652,108
Multi-Family	3,093	10,078	13,022	5,707	31,900
Mixed use	315	5,936	13,455	3,592	23,298
Commercial	10,789	4,261	13,070	2,508	30,629
Office	1,172	876	3,684	308	6,040
Industrial/Business Park	6,237	13,244	23,459	10,929	53,869
Public/Semipublic	2,700	4,026	7,583	11,190	25,498
Right-of-Way	5,074	7,506	13,405	3,480	29,466
Parks and Open Space	4,619	21,229	40,937	9,930	76,715
Vacant or Agricultural	8,412	432	7,746	422	17,011
<b>Total</b>	<b>449,514</b>	<b>259,789</b>	<b>395,015</b>	<b>272,473</b>	<b>1,376,793</b>

Source: City and County Planning and GIS departments, as compiled and tabulated by MARC. Ray County data not available.

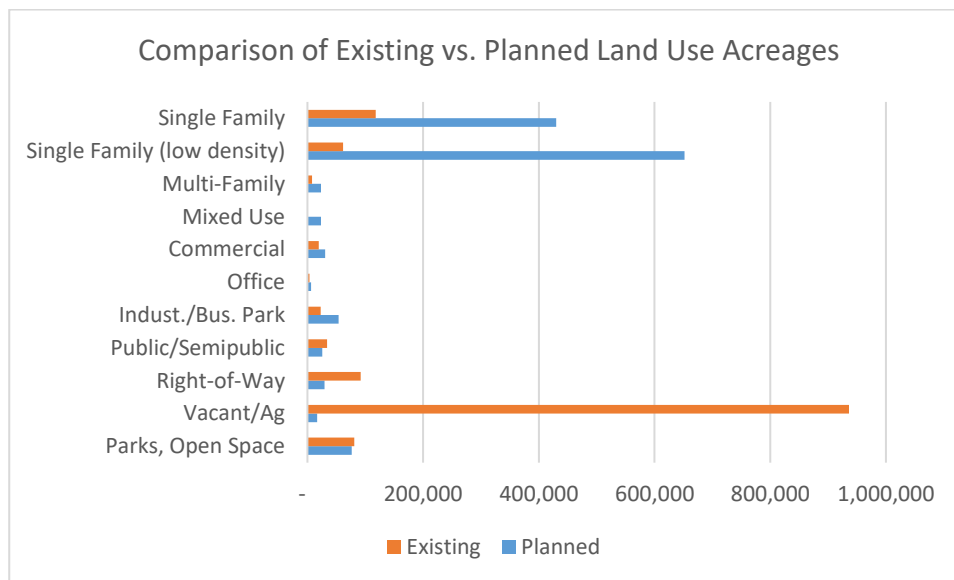


Source: City and County Planning and GIS departments, as compiled and tabulated by MARC.

**Figure 2.32: Planned Land Use and 100-Year Floodplain**

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 above (**Figure 2.32**) 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. This represents an increase in developed land of 257 percent (Source: MARC information taken from local land use plans). Given that the population in the Kansas City region as a whole is only projected to grow by 31 percent between 2010 and 2040 implies that suburbanization trends are expected to continue with new development on green field sites during the 30-year planning horizon.

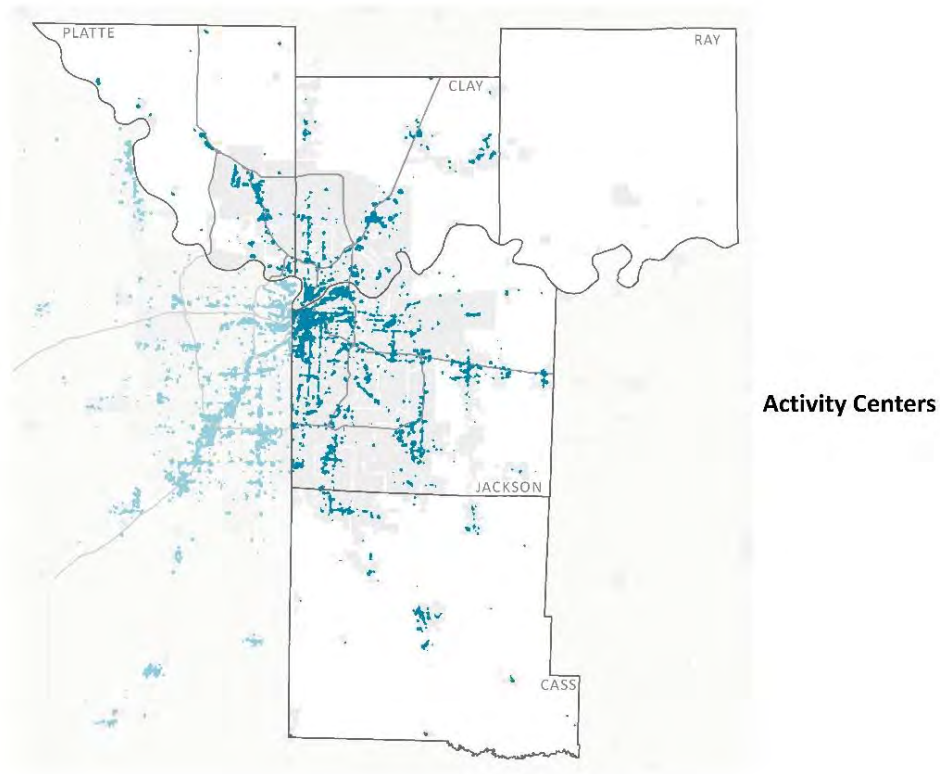


Source: City and County Planning and GIS departments, as compiled and tabulated by MARC.

**Figure 2.33: Comparison of Existing vs. Planned Land Use**

To forecast where development is expected to occur between 2010 and 2040, 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 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

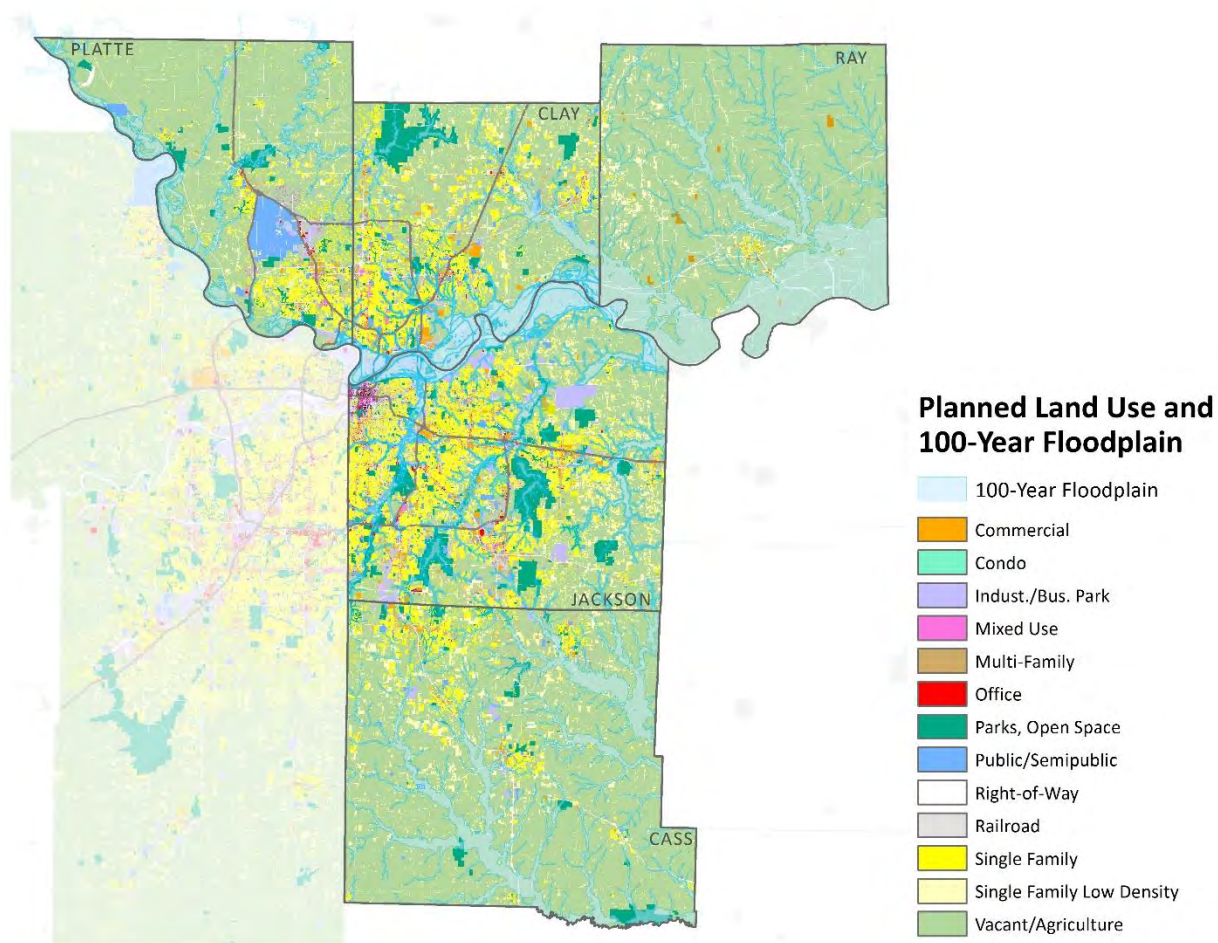
**Figure 2.34: Planning Area Activity Centers**

#### **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 is projected to occur adjacent to or near existing development, especially along existing transportation corridors and in existing or planned activity centers.





Source: MARC

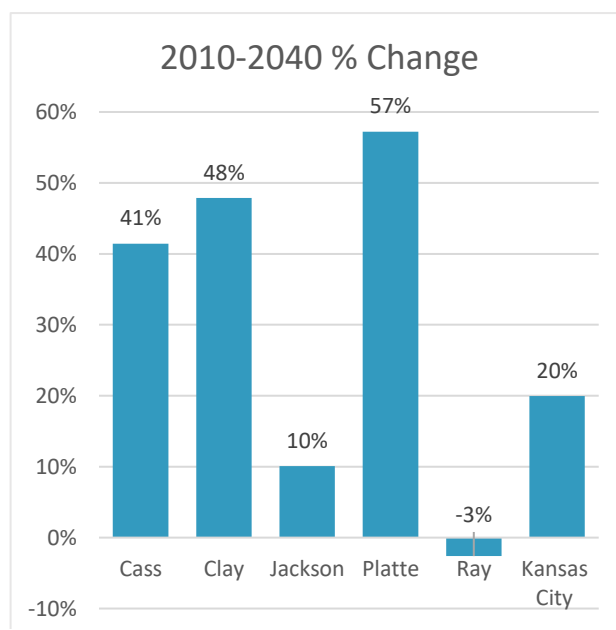
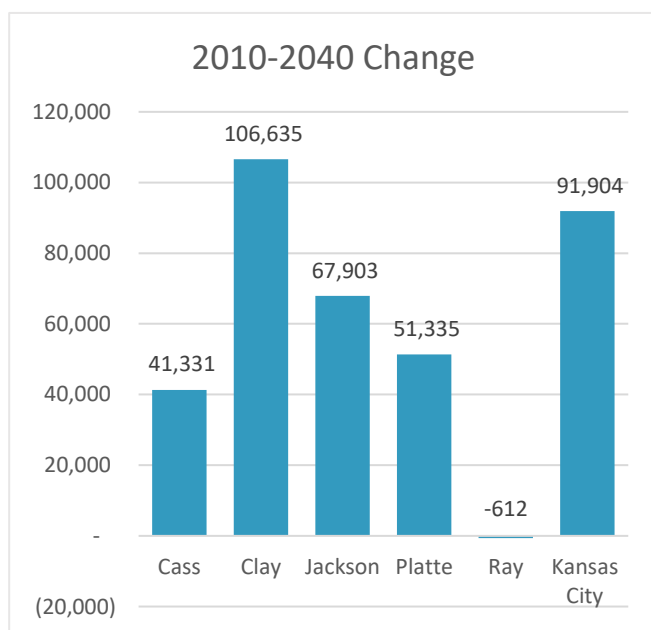
**Figure 2.35: Forecast Future Land Use with 100-Year Floodplain**

### 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 2.7)**

Table 2.7: Population Forecast						
County/Area	2010	2020	2030	2040	2010-2040 Change	2010-2040 % Change
Cass	99,757	114,438	128,303	141,088	41,331	41%
Clay	222,683	262,177	297,196	329,318	106,635	48%
Jackson	674,824	692,865	715,386	742,727	67,903	10%
Platte	89,700	105,148	122,493	141,035	51,335	57%
Ray	23,495	22,883*	-	-	-612	-3%
Planning Area	1,110,459	1,197,511	1,286,262	1,377,051	266,592	24%
MARC Region	1,925,165	2,127,176	2,325,772	2,522,111	596,946	31%
Planning Area Share	58%	56%	55%	55%	45%	-13%
Kansas City	460,737	484,791	516,342	552,641	91,904	20%

Source: Census Bureau, MARC.  
\*2018 population data



Source: MARC 2040 Forecast, American Community Survey  
\*The change is Ray county only from 2010-2018

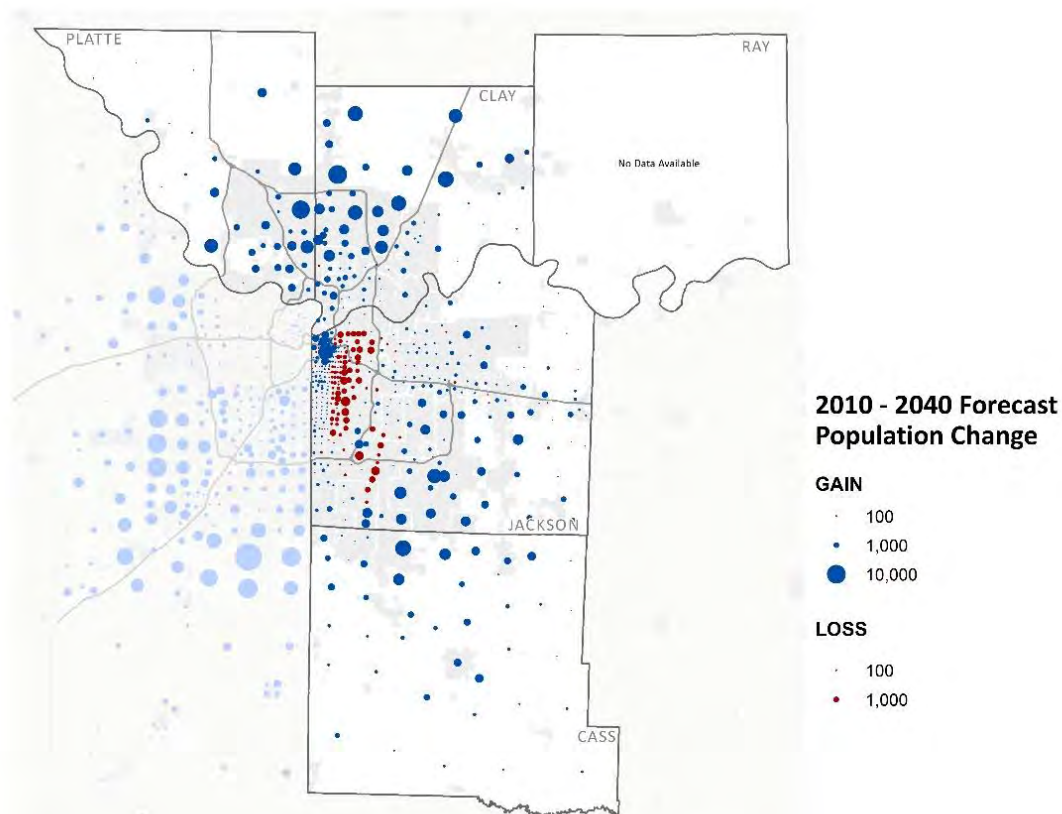
Figure 2.36: Population Change, 2010-2040

Figure 2.37: Population Change, 2010-2040 (%)

The city of Kansas City is expected to grow by around 92,000 people between 2010 and 2040, a 20 percent increase (See Figure 2.36 - Figure 2.37). 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 substantial



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 around Downtown. 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 significant population growth between 2010 and 2040 (**Figure 2.38**).

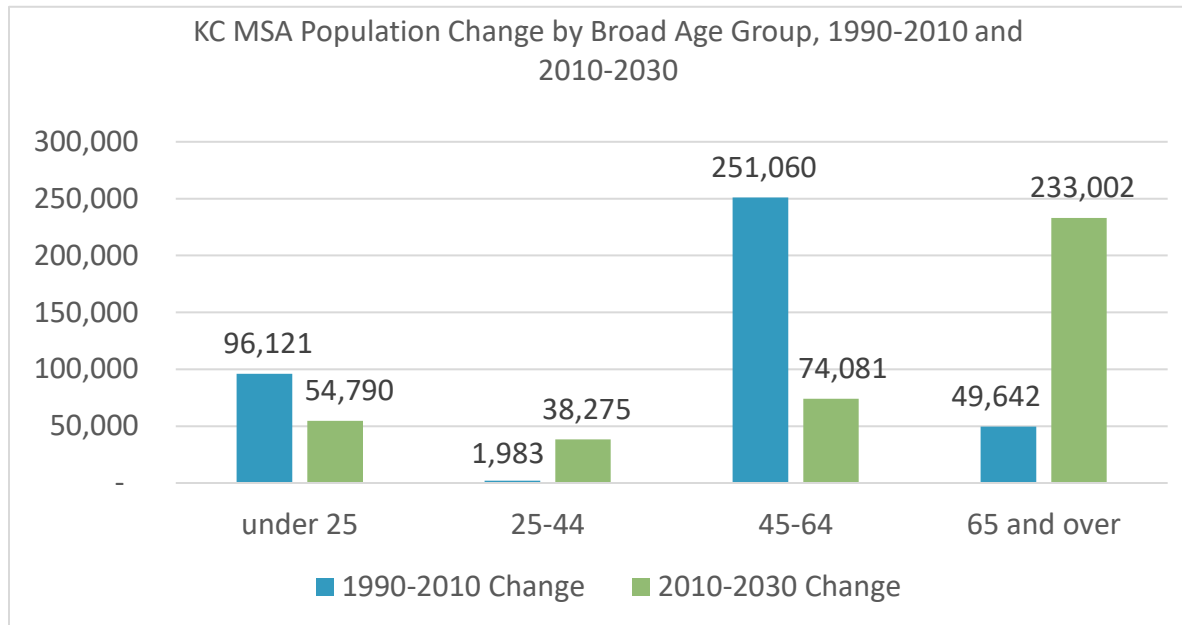


Source: MARC

**Figure 2.38: 2010-2040 Forecast Population Change**

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 2010 and 2030 (**Figure 2.39**).

In large part, this is because the post-World War II baby boom (those who were born from 1946 to 1964) began to reach retirement age in 2010. This, plus medical advances, will result in a 2030 population where the number of older adults roughly equals the number of people in other broad age groups in the community.



Source: Census Bureau, 1990 and 2010 Census, MARC

**Figure 2.39: Kansas City MSA Population Change by Broad Age Group, 1990-2010 and 2010-2030**

In 2010, older adults were 12 percent of the Kansas City region's population, a percentage that was unchanged from 1990. With the 2017 population estimates from the American Community Survey, older adults over 65 years old make up 14 percent of the five-county planning area. 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.

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 seeking 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.

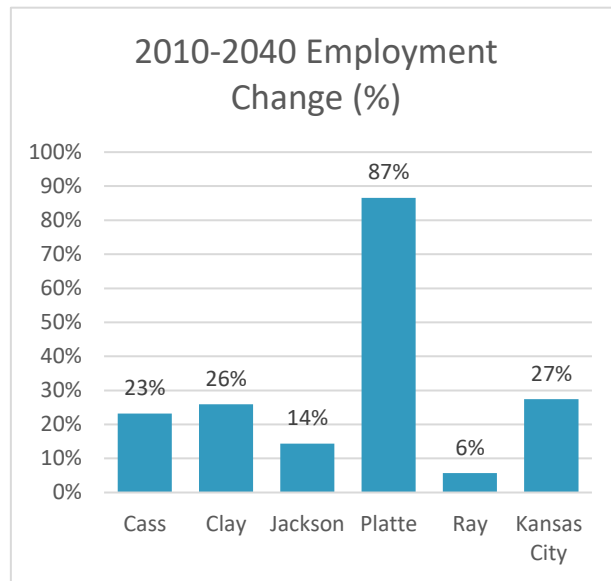
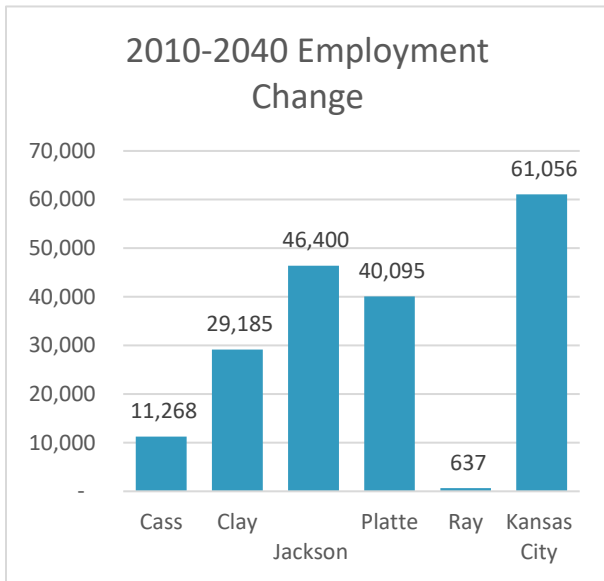
### 2.4.3 Employment Forecasts

Employment growth is expected to be more equally spread throughout the Planning Area than population. Jackson County is projected to add the most jobs between 2010 and 2040 at about 46,000, a 14 percent increase. The Platte County job forecast is a close second, at 40,000 additional jobs by 2040 due to expected development near the KCI airport. This represents close to twice as much as Platte County's 2010 employment, making it the fastest growing job generator in the Planning Area. Clay County's job growth is expected to be the next fastest, as it is forecast to increase its 2010 employment levels by 26 percent.

Cass County's job growth is expected to be the next fastest, as it is forecast to increase its 2010 employment levels by almost a quarter in 2020, resulting in a gain of 11,000 jobs. Meanwhile, Ray County's jobs will remain stable over the period. Overall, the Planning Area will add about 127,000 jobs between 2010 and 2040, a 25 percent increase. **(See Table 2.8 and Figure 2.40-2.41)**

<b>County</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2010-2040 Change</b>	<b>2010- 2040 % Change</b>
Cass	48,500	52,931	56,889	59,767	11,268	23%
Clay	112,512	123,657	133,826	141,697	29,185	26%
Jackson	323,029	337,681	353,545	369,429	46,400	14%
Platte	46,307	61,631	75,654	86,402	40,095	87%
Ray	11,149	11,786	11,786	11,786	637	6%
Planning Area	541,497	587,049	631,062	668,445	126,948	23%
<i>MARC Region</i>	946,117	1,066,199	1,178,193	1,268,290	322,174	34%
<i>Planning Area Share</i>	57%	55%	54%	53%	-5%	-8%
Kansas City	222,762	241,012	260,878	283,817	61,056	27%

Source: Bureau of Labor Statistics, Census Bureau, MARC. Ray County projection not officially adopted.



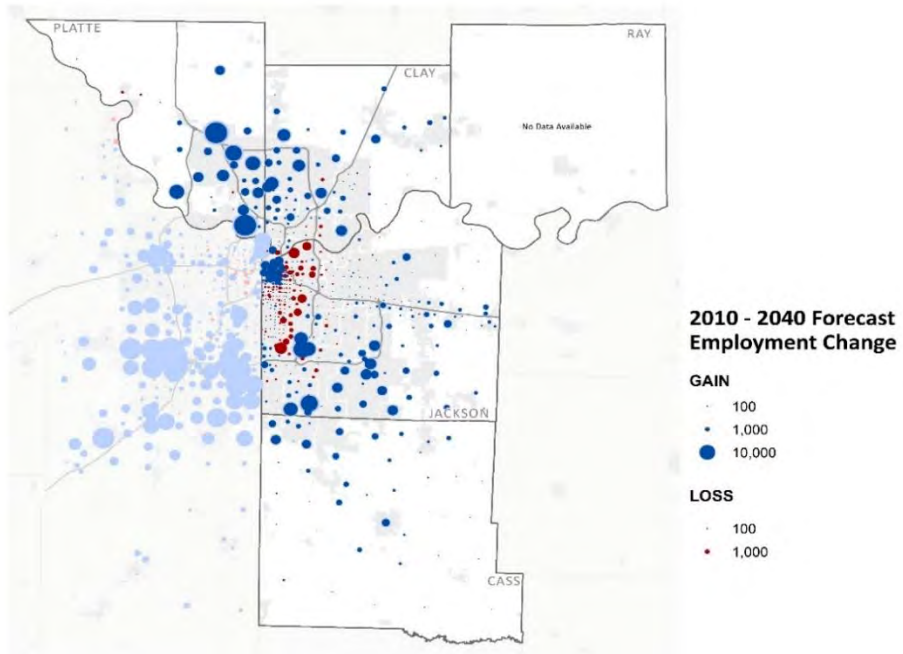
Source: Bureau of Labor Statistics, Census Bureau, MARC

**Figure 2.41: Employment Change, 2010-2040**

**Figure 2.40: Employment Change, 2010-2040 (%)**

The city of Kansas City accounts for just under half the Planning Area’s projected employment growth. In addition to the area near KCI, significant employment increases are expected in and around Downtown, at I-435 and Bannister Road due to the newly built Cerner campus, and in south Kansas City as a result of moving the National Nuclear Security Administration’s (NNSA) National Security Campus in Kansas City.

Other cities in the Planning Area expecting to add a significant number of jobs include Belton and Raymore in Cass County; Gladstone and Liberty in Clay County; Blue Springs, Grandview, Independence and Lee’s Summit in Jackson County; and Parkville and Riverside in Platte County.

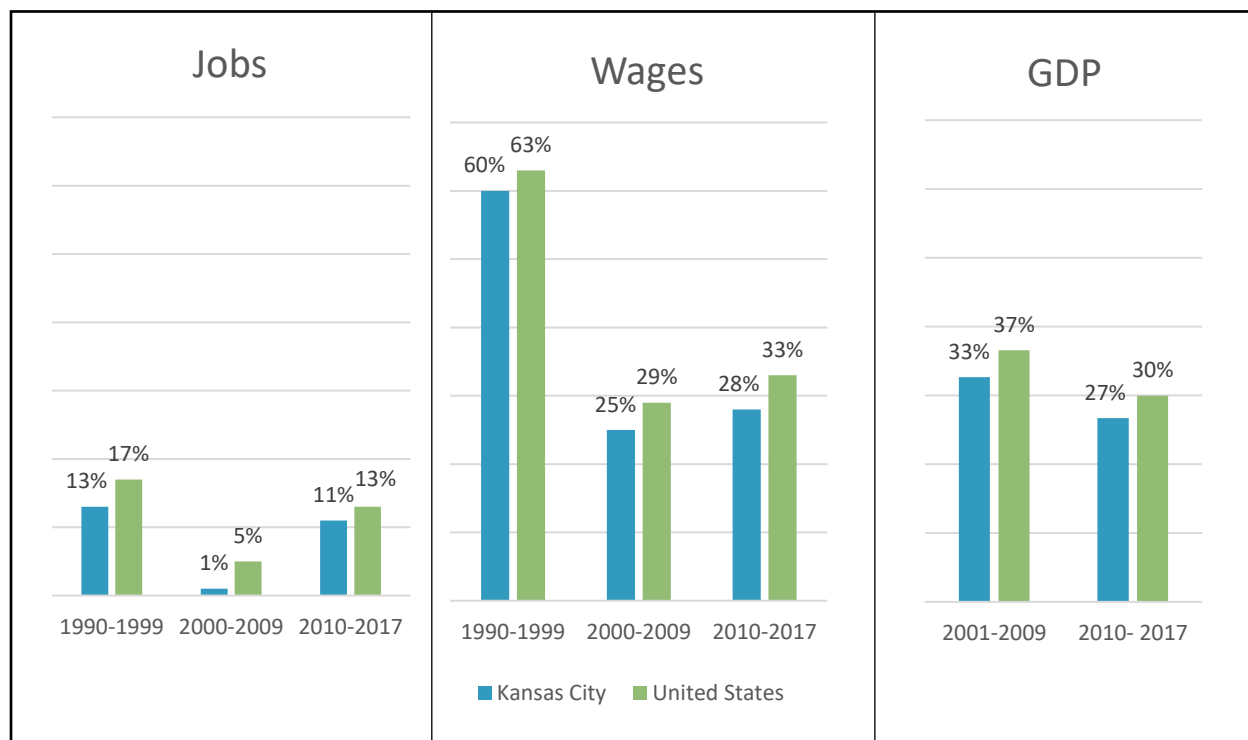


Source: MARC

**Figure 2.42: Forecast Employment Change**

### 2.5 Kansas City Regional Economy

The 2015 Plan update used data and graphics from the *Prosperity at a Crossroads* report created by the Brookings Institution and the Mid-America Regional Council in 2014 to analyze the Kansas City area economy. The report analyzed the region’s economic progression after the Great Recession. *Prosperity at a Crossroads* is not a recurring report. However, each year KC Rising measures Kansas City’s progress against peer metro areas. The KC Rising initiative is sponsored by the Civic Council of Greater Kansas City, KC Chamber, the Mid-America Regional Council and the Kansas City Area Development Council. Peer metro areas were decided by KC Rising, as the 15 metros immediately larger and immediately smaller than Kansas City by population. To analyze the planning area economy for this Plan, information and data from KC Rising metrics and the Bureau of Economic Analysis were used. **Figure 2.43** uses data from the Bureau of Economic Analysis, to analyze the change in jobs, wages, and gross domestic product (GDP) over periods of time. In the period of 2010 to 2017, Kansas City’s regional economy grew slower than the average rate of the United States. While growth rates were behind the national averages, Kansas City followed these growth trends very closely.



Source: Bureau of Economic Analysis

**Figure 2.43: Growth in GDP, Jobs, and Wages**

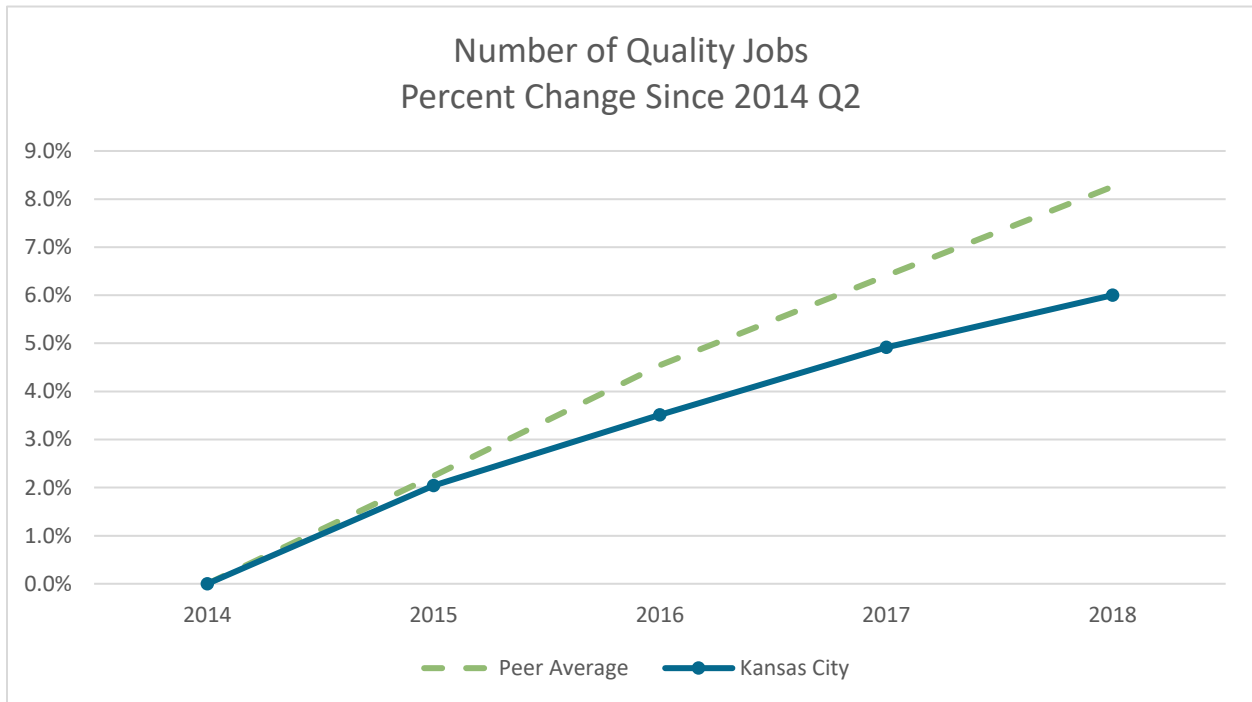


Source: Bureau of Economic Analysis; Prepared by MARC

**Figure 2.44: Kansas City Compared to the Peer Metro Areas - Percent Change from 2010-2017**

Figure 2.44 shows the percent change in GDP and employment in each peer metro area. The Kansas City region’s GDP has increased by 27 percent from 2010 to 2017, yet it remains behind the peer metro growth average of 34 percent. Similarly, Kansas City had an employment growth rate percentage at 12 percent and the peer metro average is 15 percent.

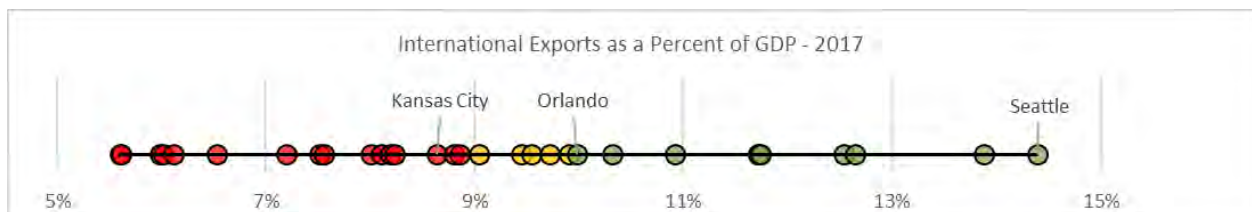
**Figure 2.45** shows Kansas City ranked as 13th among the peer metros in the number of “Quality Jobs” available in the region. Quality jobs are characterized as occupations that require at least a postsecondary degree or certification or pay more than the U.S. median earnings of \$21.05 an hour, or \$43,784 per year.<sup>i</sup> Kansas City's quality job growth in 2017 was only 6.0 percent compared to a much higher average, 8.3 percent by peer metros.<sup>ii</sup>



Source: KC Rising Metrics

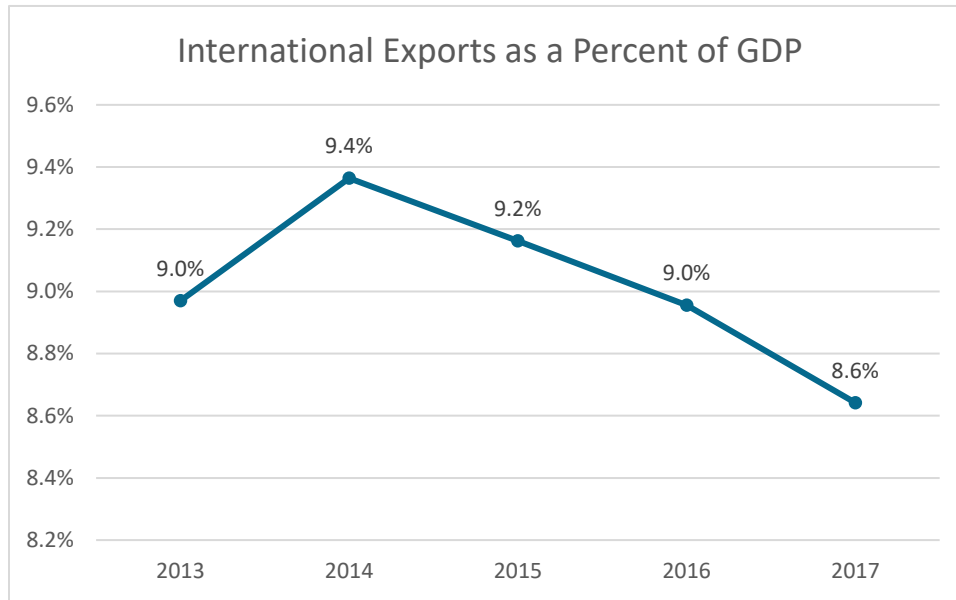
**Figure 2.45: Kansas City Compared to Peer Metro Average in Quality Jobs - Percent**

One reason for the region’s recently sagging economic performance relative to peers and the rest of the U.S. has been its lackluster exports. Regional economies thrive when they produce goods and services of value for the rest of the world outside their borders. However, metropolitan Kansas City’s net exports – i.e., the value of what it exports minus the cost of what it imports – has been declining as a share of the region’s overall economic output (Source: MARC, KC Rising metrics), as measured by its contribution to Gross Domestic Product (GDP). This drop has been particularly rapid since 2014. In relation to the peer metros, from 2016 to 2017, the Kansas City region went from 15<sup>th</sup> to 18<sup>th</sup> in International Exports.



Sources: KC Rising, Trade-Strategies

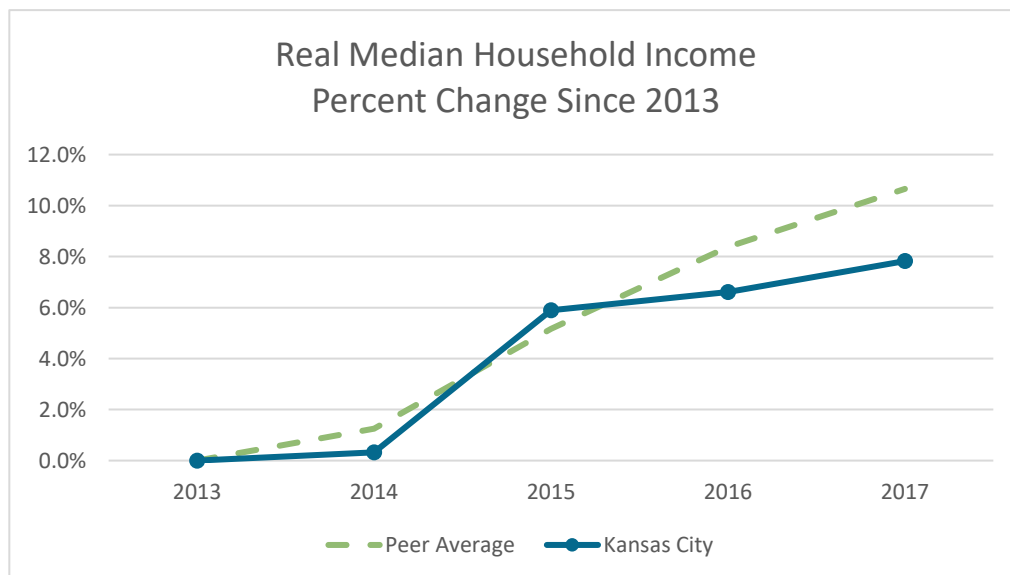
**Figure 2.46: International Exports as a Percent of GDP, 2017**



Source: KC Rising

**Figure 2.47. International Exports as a Percent of GDP**

**Figure 2.48** shows the percent change in the median household income for Kansas City each year over a four-year period, 2013-2017. The Real Median Household Income was \$58,804 in 2013 and \$63,404 in 2017. The Kansas City area is not progressing as fast as the peer metro average incomes of \$59,651 in 2013 and \$66,006 in 2017. The 2015 Plan mentioned concerns about real incomes declining faster here than elsewhere. Unfortunately, years after the economic crisis, Kansas City continues to lag other peer metros in terms of growth in real median household income.



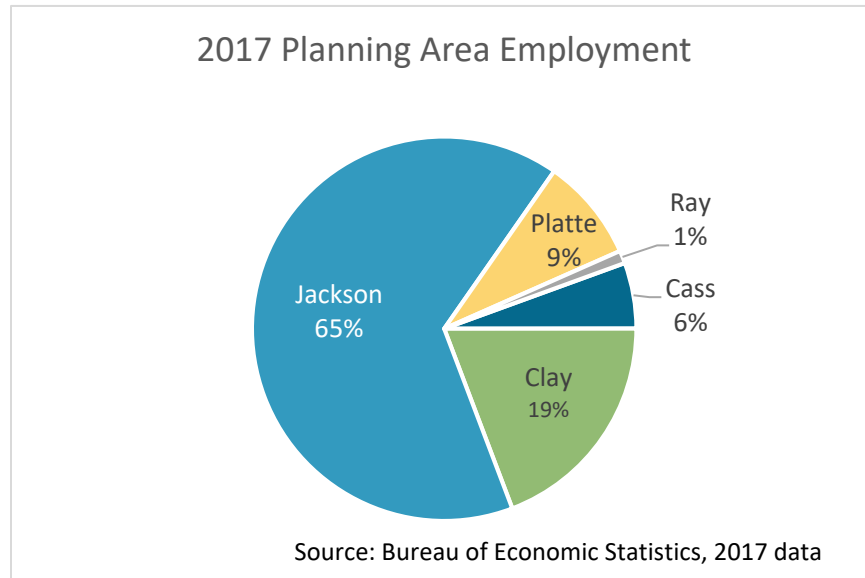
Source: KC Rising

**Figure 2.48: Greater Kansas City's Real Median Household Income Percent Change, 2013-2017**



**2.5.1 Planning Area Economy**

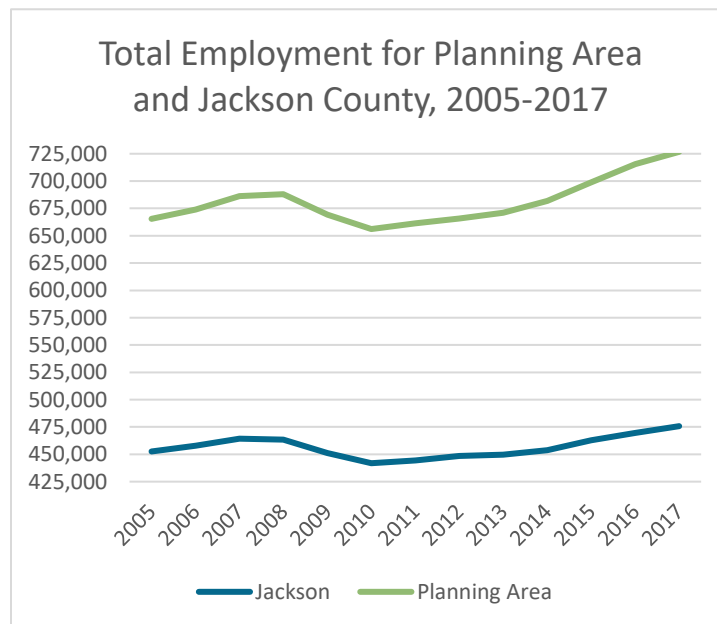
Jackson County comprises two-thirds the Planning Area economy, with over 475,000 jobs of its total job count of just over three-quarters of a million. Clay and Platte counties form the next largest portion of



the Planning Area economy with about one-quarter of its jobs, combined. Clay County’s 140,000 jobs account for 19 percent of the area job total, while Platte County’s 63,000 jobs contribute another 9 percent. The remaining 7 percent of the Planning Area’s jobs are mostly in Cass County, with Ray County contributing one percent. (Source: BEA)

**Figure 2.49: Planning Area Employment, 2017**

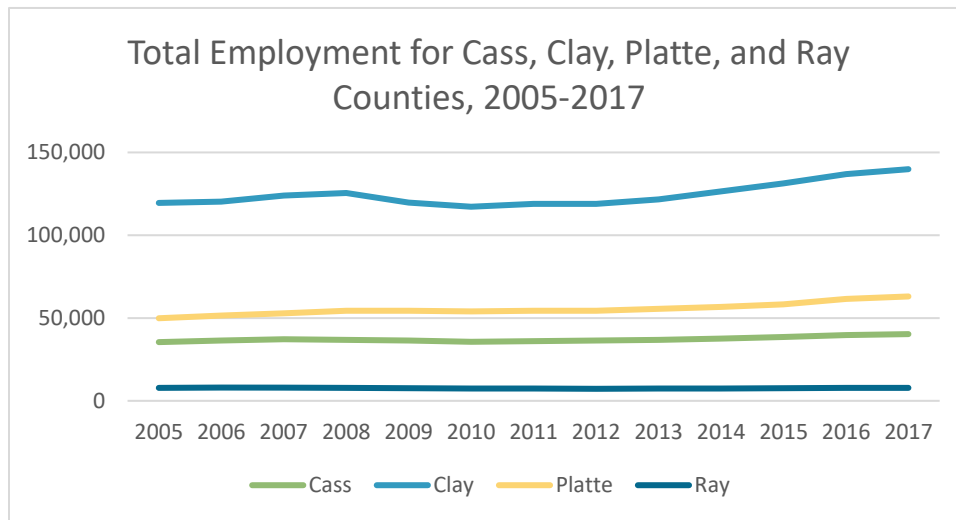
The 2015 Plan update characterized the Planning area as struggling to regain the jobs lost because of the Great Recession. During that period, 2008- 2011, employment declined by some 32,000 jobs. Since the last plan update, the planning area has gained about 45,000 jobs in the three years, 2014-2017.



Source: Bureau of Economic Analysis

**Figure 2.50: Total Employment for Planning Area and Jackson County, 2005-2017**

During the Great Recession, more than 90 percent of the job loss occurred in Jackson County, which saw an employment decline of 30,000 during the 2008-2011 period. With 2017 data from the Bureau of Economic Analysis, all counties in the planning area have recovered to the pre-recession employment numbers or higher, except for Ray County.



Source: Bureau of Economic Analysis.

**Figure 2.51: Total Employment for Cass, Clay, Platte, and Ray Counties, 2005-2017**

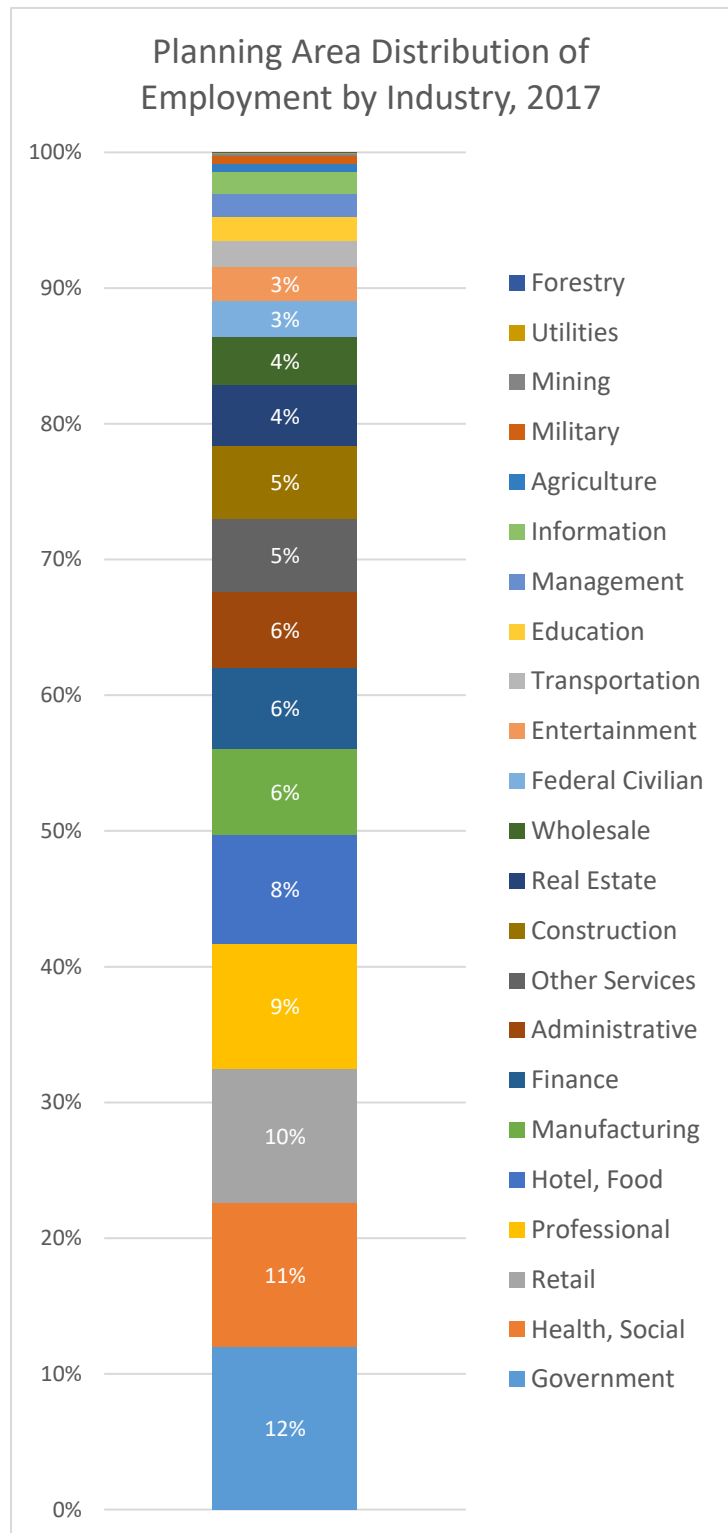
**2.5.2 Employment by Industry**

Government is the largest industry in the Planning Area, comprising 12 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 percent of the area’s employment, followed by retail and the professional services industry with 10 percent and nine percent of the planning area’s overall employment.

The accommodations and food services industries are next with eight percent. 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. Manufacturing accounts for about six percent of the jobs in the planning area, finance and insurance accounts for six percent, and administration accounts for six percent of the planning area as well. (Source: EMSI 2017)

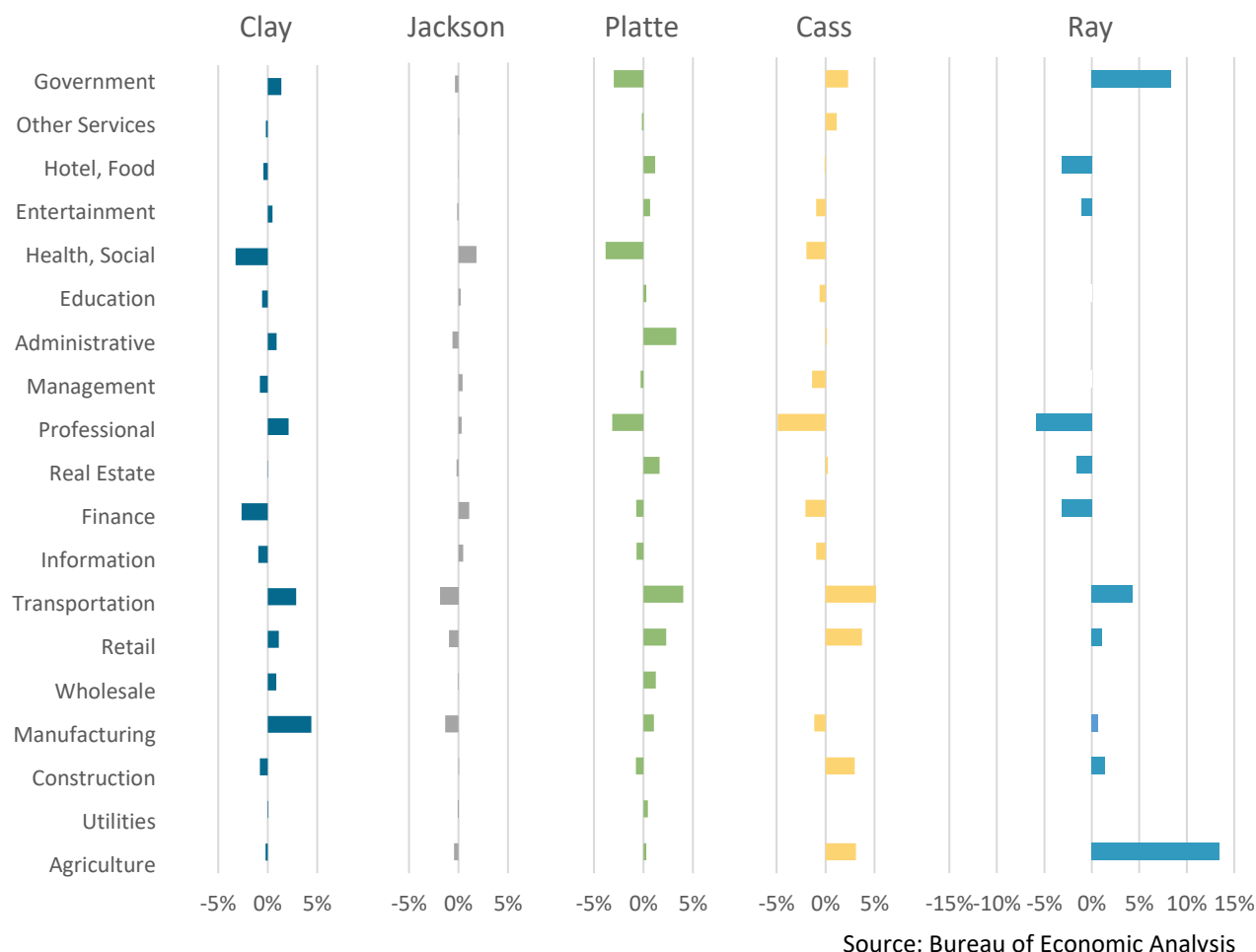
Different counties specialize in different industries, however, so it is useful to compare their distribution of employment with the Planning Area overall.



Source: Economic Modeling Specialists International (EMSI), 2017.

**Figure 2.52: Planning Area Distribution of Employment by Industry**

See **Figure 2.53: Difference between County and Planning Area Percent Distributions of Employment by Industry 2017** below for county comparisons. Industries in certain counties are not shown to avoid disclosure of confidential information; however, the estimates are included in higher-level totals (Bureau of Economic Analysis).



**Figure 2.53: Difference between County and Planning Area Percent Distributions of Employment by Industry, 2017**

Because Jackson County makes up two-thirds of the planning area economy, each industry category shows little deviation from the planning area average. Still, Jackson County does specialize in Health and Finance when compared to the other counties.

Cass, being more rural, specializes in agriculture and transportation compared the area average. It also has a higher concentration of government and retail trade employment.

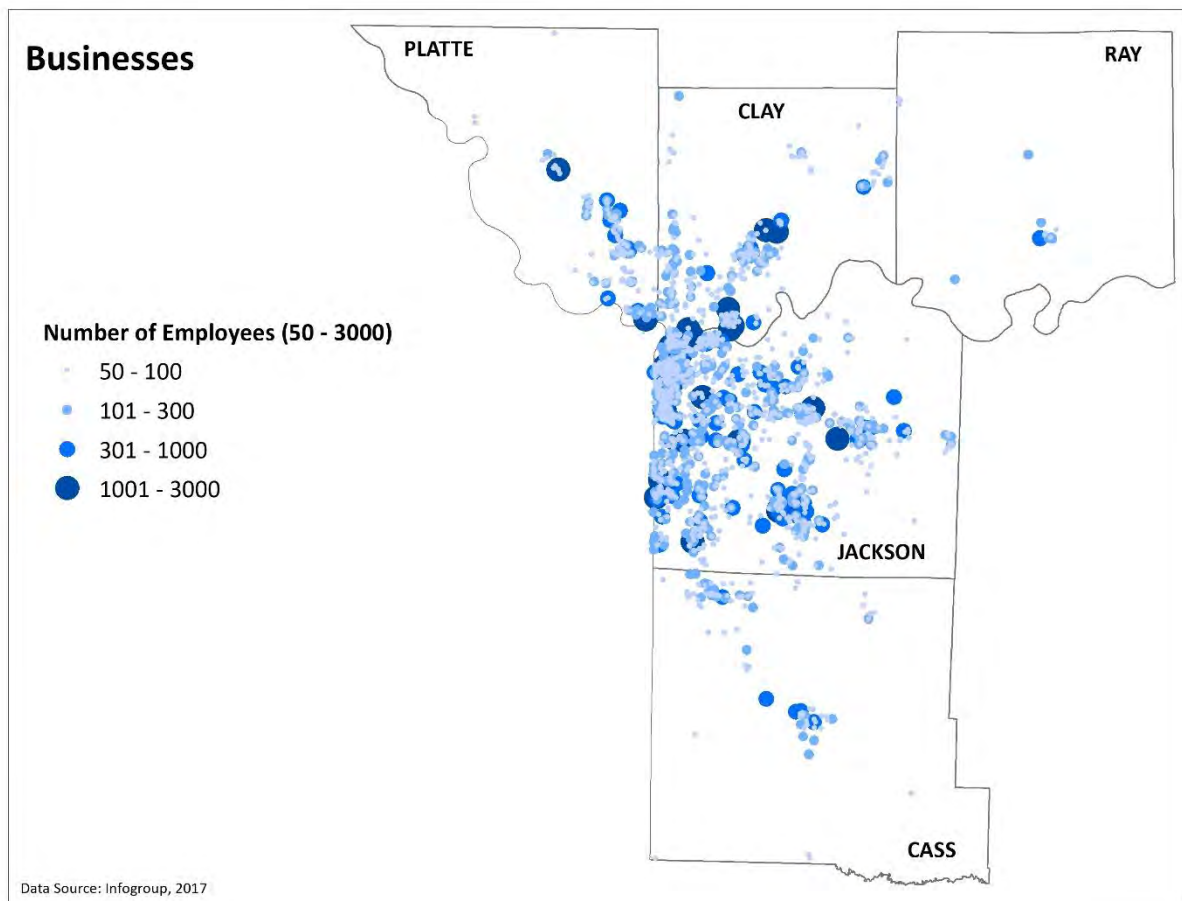
Clay County specializes in manufacturing and transportation, in part due to the presence of Ford, as well as professional services, largely due to the presence of Cerner’s headquarters.

Platte County has a more diverse employment base. Due to the presence of KCI airport, there is a concentration of hotel and food employment and wholesale trade along the I-29 corridor. A large proportion of the office space near the airport is being used as satellite campuses for post-secondary

institutions, resulting in a concentration of education and administrative support employment as well. It has also become a center for retail trade. Finally, some manufacturers have found the airport location to be advantageous, creating a concentration in that sector. Platte County has a significantly lower percentage than average for the planning area in the number of government, health and professional services' jobs.

Unlike the other counties that show values between +/- 5, Ray County shows values between +/- 15. Its economy differs the most from the Planning Area average because it is the most rural. As a result, it specializes in Agriculture, contributing over 13 percent more than the planning area average. In contrast, its second largest concentration of employment is found in the government sector.

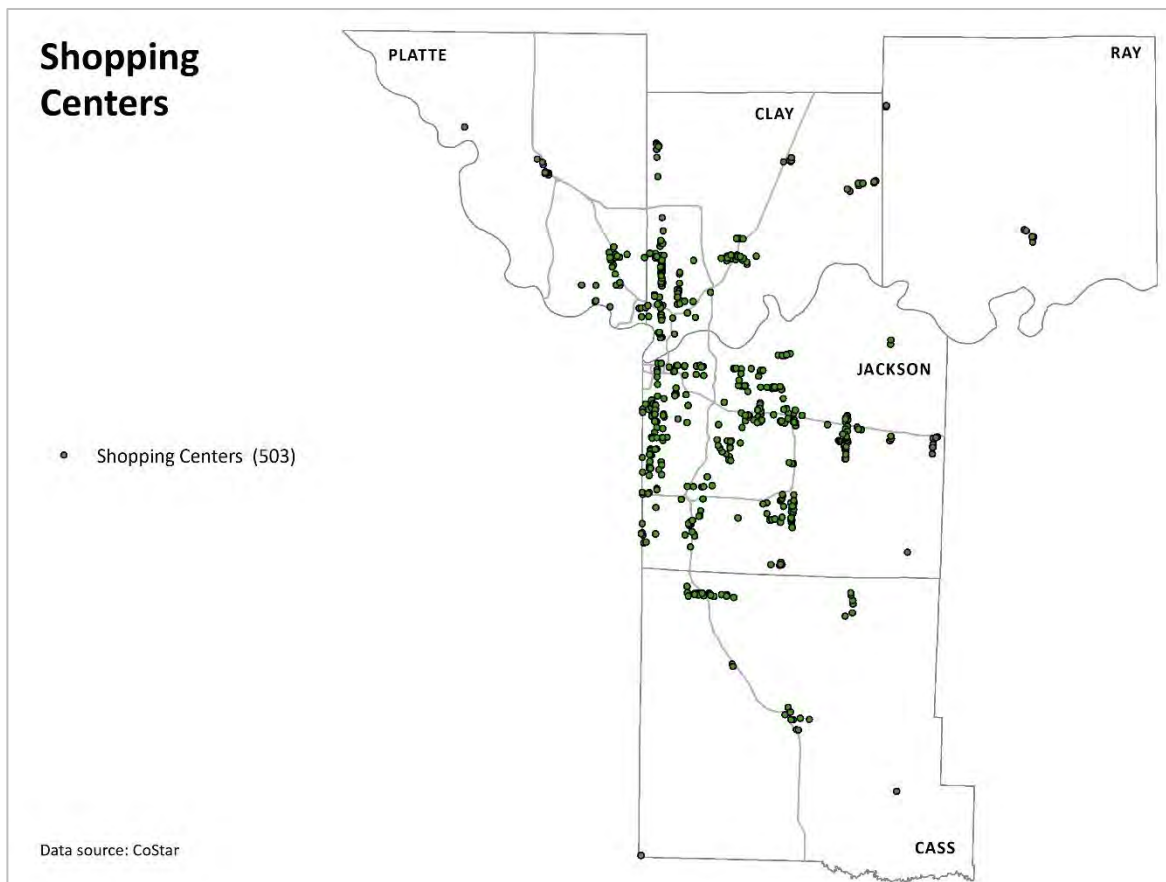
### 2.5.3 Employment location



**Figure 2.54: 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.

Shopping centers locate 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 2.55: Area Shopping Centers.). 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.

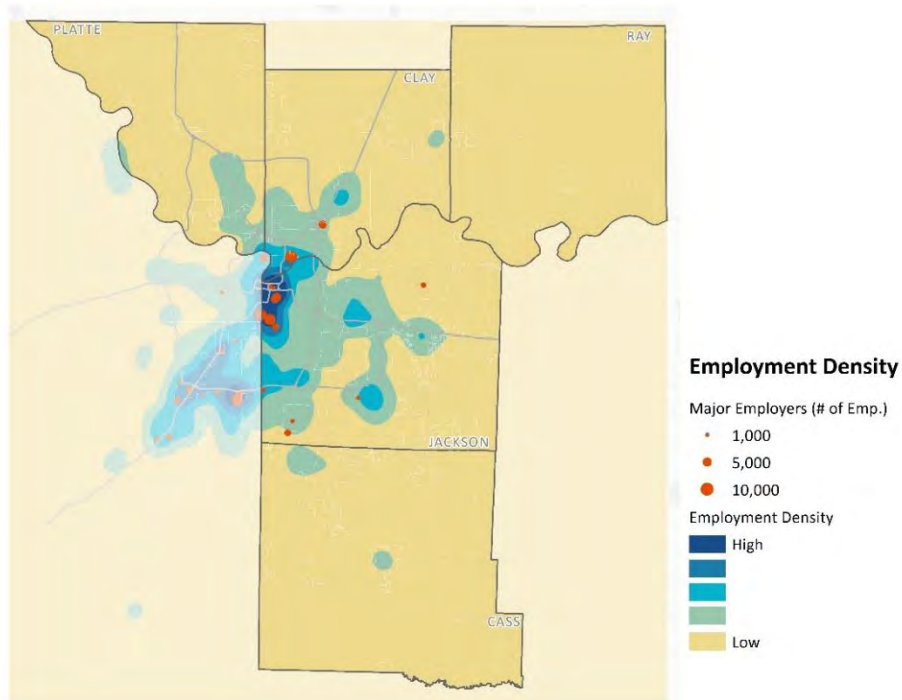


**Figure 2.55: Area Shopping Centers**

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, planning is underway for an extension from Union Station/Crown Center to the Country Club Plaza and University of Missouri-Kansas City. Additionally, a new 800-room convention hotel mentioned in the last plan will be opening in Spring 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)

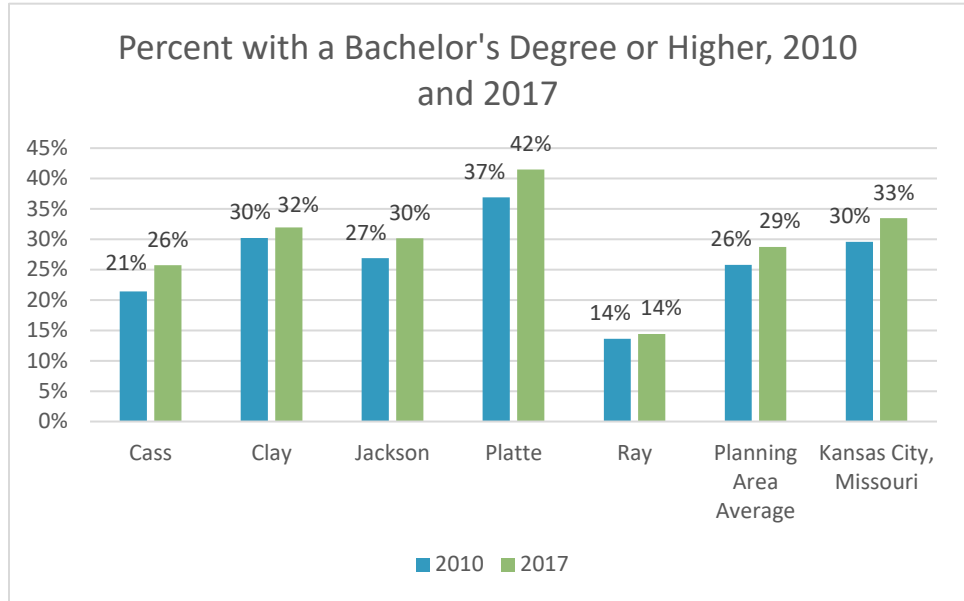


Source: Census Bureau, Longitudinal Employer-Household Dynamics (LEHD)  
Origin-Destination Employment Statistics (LODES), 2011

**Figure 2.56: 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 three percent increase in the overall educational attainment average between 2010 and

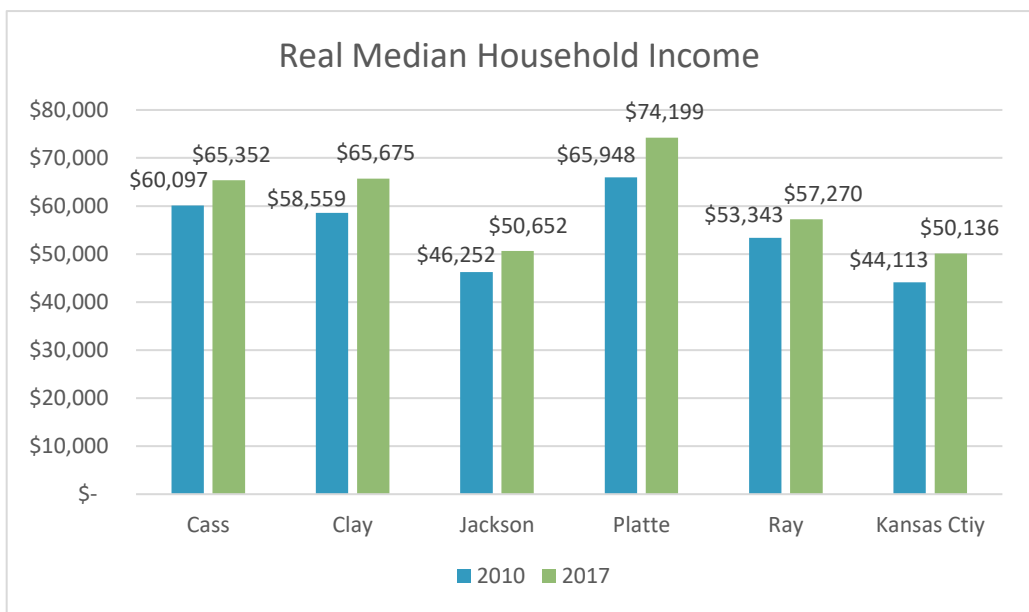


Source: 2010 Census and American Community Survey, 5-year data, 2013-2017

**Figure 2.57: Bachelor's Degree or Higher, 2010 and 2017 (%)**

2017. It was led by Platte County, whose residents’ attainment of a bachelor’s degree increased five percentage points over the period, to 42 percent. Clay County has the second highest average level of educational attainment in the planning area, with 32 percent of its residents earning at least a bachelor’s degree. In the 2010-2017 period, Ray County has increased the slowest, at 0.08 percent. (Figure 2.57)

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.<sup>iii</sup> Real incomes are those after adjusting for inflation and so



Source: 2010 Census and 2017 American Community Survey, 5-year data

**Figure 2.58: Real Median Household Income**

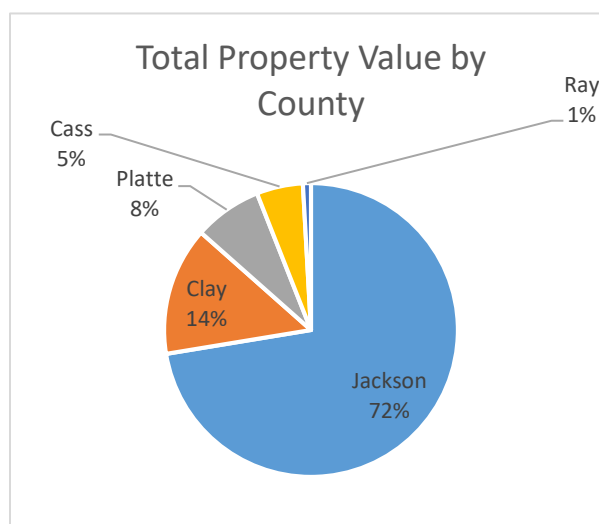


measure the purchasing power of households. The data in 2010 and 2017 is based on inflation adjusted dollars for that year. Because the consumer price index increased 13 percent in the Kansas City metropolitan area over this period<sup>iv</sup>, nominal incomes would have needed to increase 13 percent simply to keep up. Unfortunately, none of the planning area counties were able to increase their incomes by 13 percent. Platte County was the closest, needing a little over \$300 more to reach an increase of 13 percent.

Platte County has the highest median household income of all planning area counties with \$74,199 in 2017. Households residing in Clay and Cass counties have the next highest incomes, with their median households earning around \$65,000. Jackson County has the lowest median household income of any county in the planning area, at \$50,652. This is largely due to the concentrated poverty in the city of Kansas City, which itself has a median household income of \$50,136.

## 2.6 Property Value

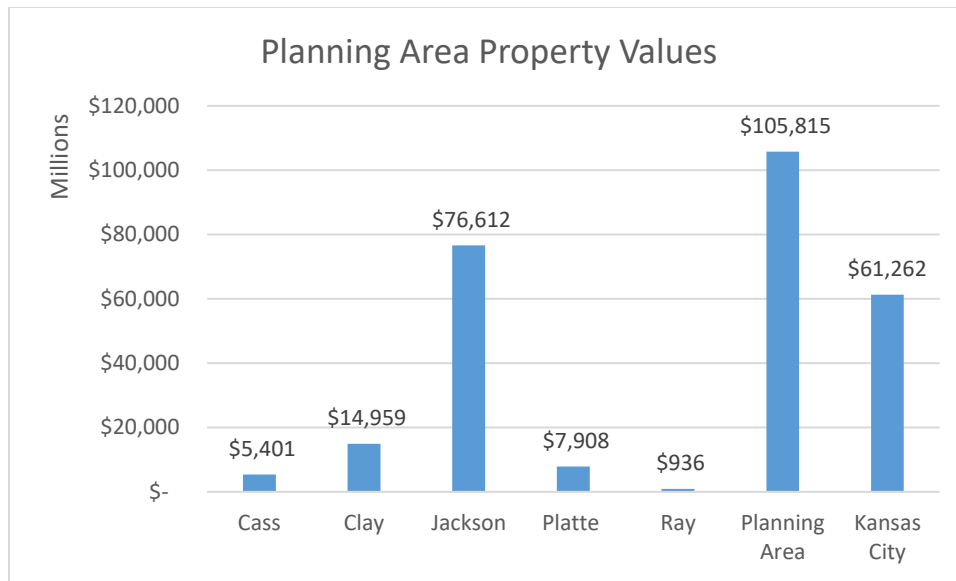
Despite having the lowest household incomes among the counties in the planning area, Jackson County contains a significant majority of real estate value due to its relative size and its function as an employment center. Jackson County is home to 60 percent of the planning area's population, and 72 percent of its property value, approximately the same as its percentage of the planning area employment. Clay County contains 14 percent of the real estate property value in the planning area and Platte County contains eight percent, both of which are also about the same as their share of the area's employment. (See Figure 2.59)



Source: County Assessors, 2012

**Figure 2.59: Total Property Value by County**

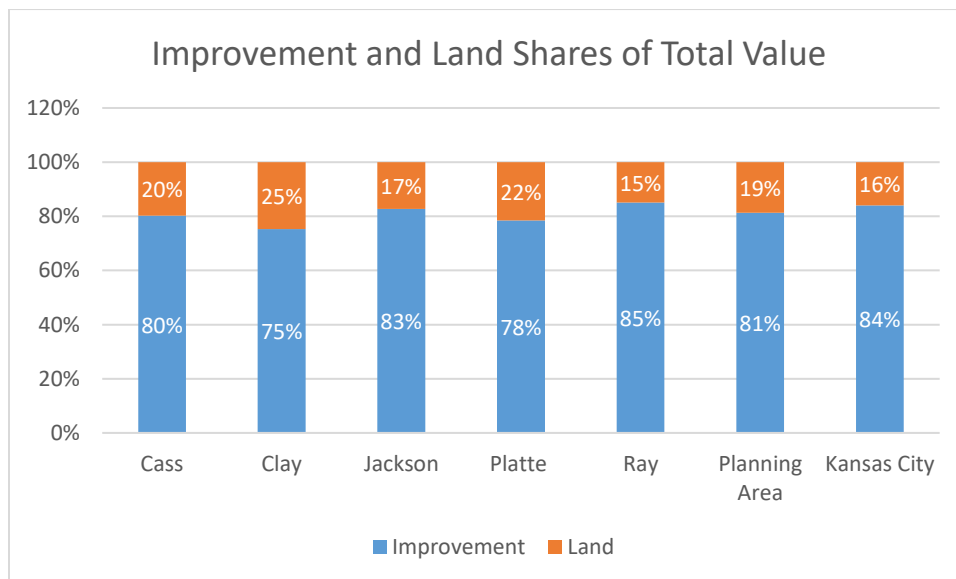
The total value of real estate property in the planning area in 2012 was approximately \$105.8 billion. Jackson County accounted for \$76.6 billion of that, followed by Clay with \$15.0 billion, Platte with \$7.9 billion, Cass with \$5.4 billion, and Ray with \$0.9 billion. The city of Kansas City alone accounted for over half (58 percent) of the property value in the planning area with \$61.3 billion. (See Figure 2.60: Planning Area Property )



Source: County Assessors, 2012

**Figure 2.60: Planning Area Property Values**

Improvements, principally buildings, comprise 81 percent of the total property value in the planning area, with land value accounting for the remaining 19 percent. These shares are remarkably stable across the counties in the area. Land’s share of total property value ranges from a low of 15 percent in Ray County to a high of 25 percent in Clay County. **(Figure 2.61)**



Source: County Assessors, 2012

**Figure 2.61: Improvement and Land Shares of Total Property Value**

<b>County/Area</b>	<b>Improvement</b>	<b>Land</b>	<b>Total</b>
Cass	\$ 4,331,361,133	\$ 1,069,542,390	\$ 5,400,903,523
Clay	\$ 11,264,257,389	\$ 3,694,354,650	\$ 14,958,612,039
Jackson	\$ 63,397,277,836	\$ 13,214,964,272	\$ 76,612,242,108
Platte	\$ 6,200,789,371	\$ 1,706,797,920	\$ 7,907,587,291
Ray	\$ 796,236,331	\$ 139,604,114	\$ 935,840,445
<b>Planning Area</b>	<b>\$ 85,989,922,060</b>	<b>\$ 19,825,263,346</b>	<b>\$ 105,815,185,406</b>
Kansas City	\$ 51,463,280,508	\$ 9,798,273,172	\$ 61,261,553,680

Source: County Assessor, 2012

## 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.

Major trucking companies, including YRC Freight, 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 and a number of smaller 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).

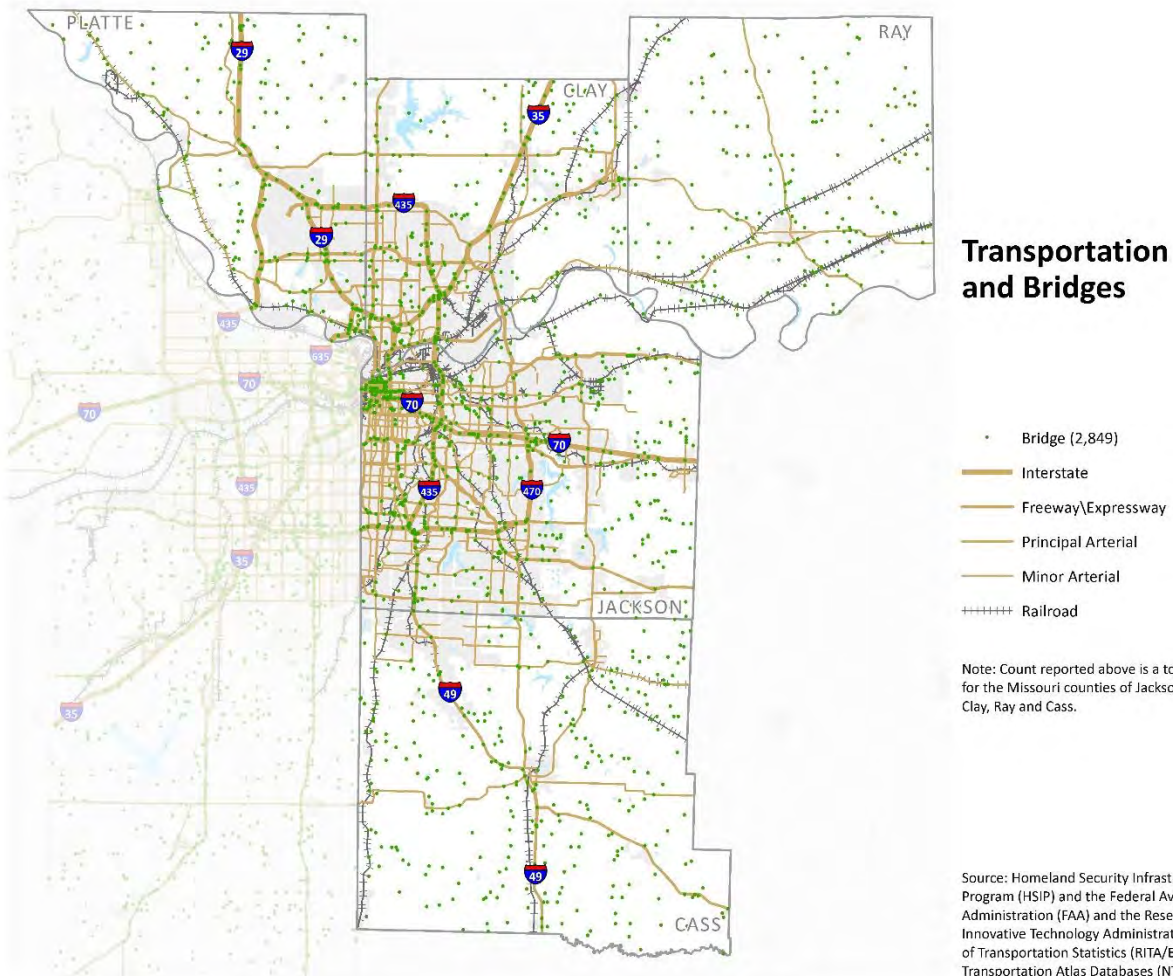
### 2.7.2 Roadway System Infrastructure

Kansas City's system of roadways is among the most extensive in the nation. According to Federal Highway Administration statistics, the Kansas City region has the most freeway miles per person of all urbanized areas with populations greater than 500,000. The Kansas City metro area also has the fourth highest total roadway miles per person and the eleventh highest daily vehicle miles traveled (DMVT) per capita.<sup>v</sup>

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 2.10** 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 2.10: 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
<b>Total</b>	<b>503</b>	<b>616</b>	<b>1,305</b>	<b>415</b>	<b>2,839</b>

Source: MARC



Source: Homeland Security Infrastructure Program, Research and Innovative Technology Administration's Bureau of Transportation Statistics (RITA/BTS), MARC

**Figure 2.62: Planning Area Major Roads, Bridges, and Rail Lines**

### 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.<sup>vi</sup> 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, 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 report found 27 percent of the Kansas City region’s roads to be in mediocre condition; 17 percent fair; and 30 percent good.<sup>vii</sup> 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.<sup>viii</sup> 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). Category *Cycle Track* has been added since the last Plan update. *The Share-the-Road Bikeways* category has also changed. The mile values are significantly less than the 2015 Plan values due to changing paths. Some paths are designations with no signs, or the paths have moved into bike routes or bike lanes. Additionally, many communities in the region have adopted local plans for both on-road and off-road facilities.

	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

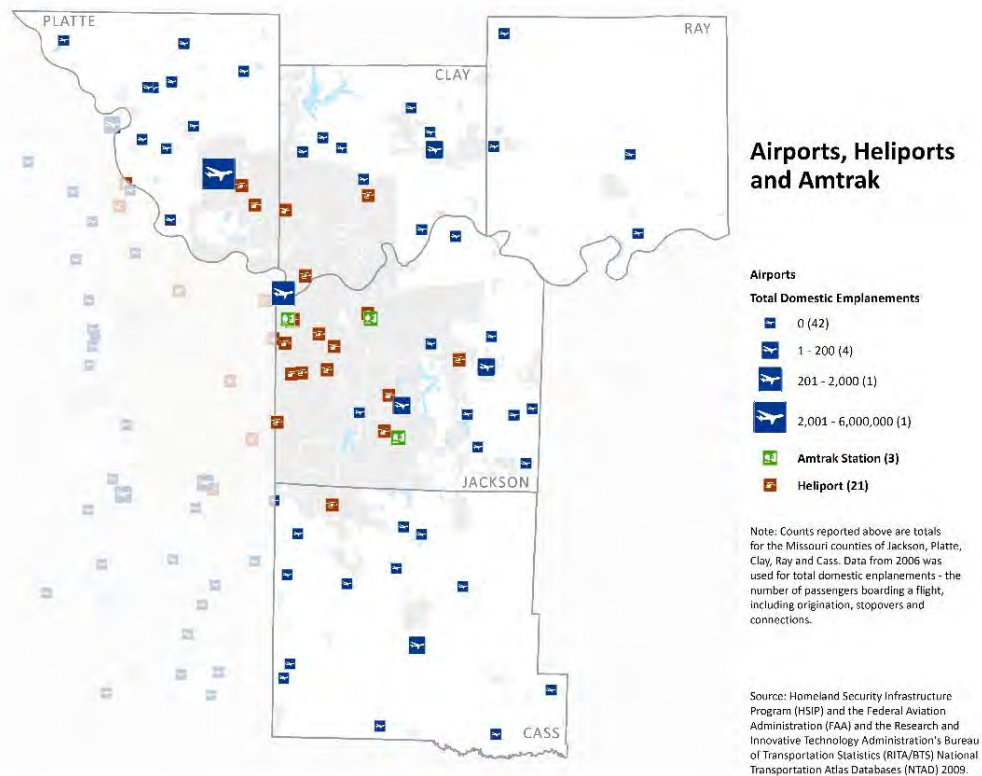
### 2.7.5 Freight and Goods Movement Facilities

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: Homeland Security Infrastructure Program, Federal Aviation Administration (FAA) Research and Innovative Technology Administration’s Bureau of Transportation Statistics (RITA/BTS), National Transportation Atlas Databases (NTAD) 2009.

**Figure 2.63: Airports, Heliports, and Amtrak**

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.

**Table 2.12: Freight Weight in Tons**

	KC Exports (Thousands)		% Change in Exports	KC Imports (Thousands)		% Change in Imports
	2012	2017		2012	2017	
	Truck	33,119.79		35,737.96	8%	
Rail	6,963.91	8,381.86	20%	14,670.55	12,656	-14%
Water	0.95	0.17	-82%	76.89	52	-32%
Air (include truck-air)	28.33	15.39	-46%	16.28	11	-35%
Multiple Modes and Mail	1,376.72	1,353.84	-2%	1,731.73	1,810	5%
Pipeline	6,143.02	4,100.77	-33%	7,858.30	6,296	-20%
Other and Unknown	37.14	29.89	-20%	6.75	33	392%

**Table 2.13: Monetary Value of Freight**

	KC Exports (Millions of Dollars)		% Change in Exports	KC Imports (Millions of Dollars)		% Change in Imports
	2012	2017		2012	2017	
	Truck	\$ 50,019.46		\$ 51,472.08	3%	
Rail	\$ 2,917.54	\$ 3,429.90	18%	\$ 3,000.68	\$ 3,134.03	4%
Water	\$ 0.61	\$ 0.06	-90%	\$ 42.94	\$ 29.15	-32%
Air (include truck-air)	\$ 2,356.85	\$ 1,444.06	-39%	\$ 944.41	\$ 800.12	-15%
Multiple Modes and Mail	\$ 8,056.61	\$ 7,477.80	-7%	\$ 9,277.72	\$ 8,985.33	-3%
Pipeline	\$ 1,389.80	\$ 927.78	-33%	\$ 2,277.41	\$ 1,840.14	-19%
Other and Unknown	\$ 280.93	\$ 415.96	48%	\$ 62.79	\$ 1,473.21	2246%

Source: Center for Transportation Analysis, Freight Analysis Framework Data Tabulation Tool (FAF4)



### 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. Since then, the agencies have coordinated in other ways as well:

- Created one regional fare (\$1.50)<sup>1</sup> and standard monthly fare pass.
- Made the system free to ride for all qualified paratransit users.<sup>2</sup>
- 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.<sup>3</sup>
- 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.

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 will start 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)

### 2.7.7 Other Critical Infrastructure

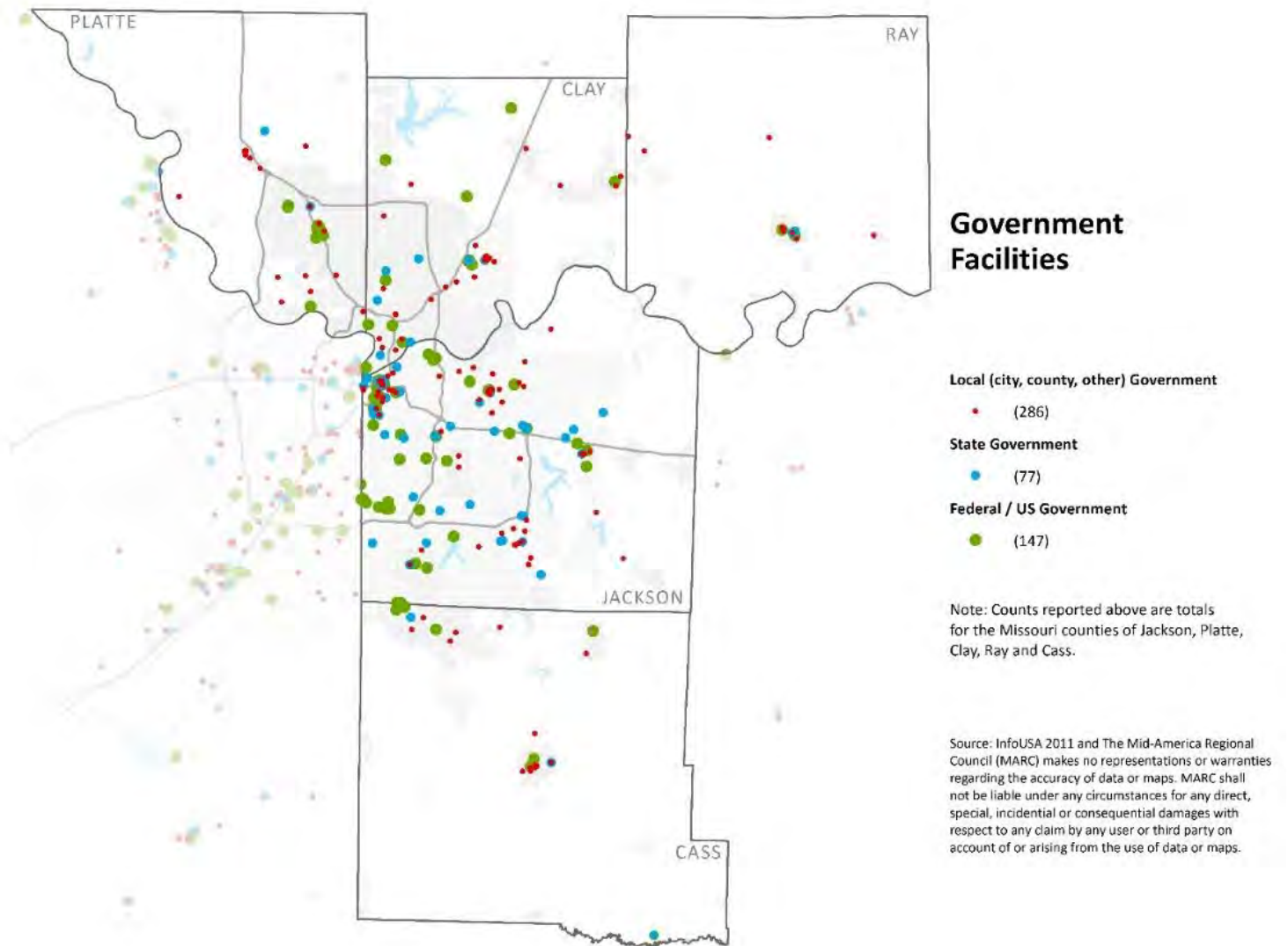
In addition to transportation infrastructure, other community facilities make up important components of the region’s critical infrastructure. Some of these are critical to responding in times of emergencies, including the locations of first responders and medical centers. Others are places where large numbers of people typically congregate and therefore represent locations of high population vulnerability, such as schools, day care, nursing homes, apartments and public housing. Still others are locations where hazardous materials are stored.

The table below includes the number of each type of facility for each county in the Planning Area, as well as Kansas City. After the table, maps of the facilities follow compiled from city and county databases. Each color grouping in the table represents a different map. The maps of critical infrastructure provide important input into the assessment of risk and vulnerability for each hazard.



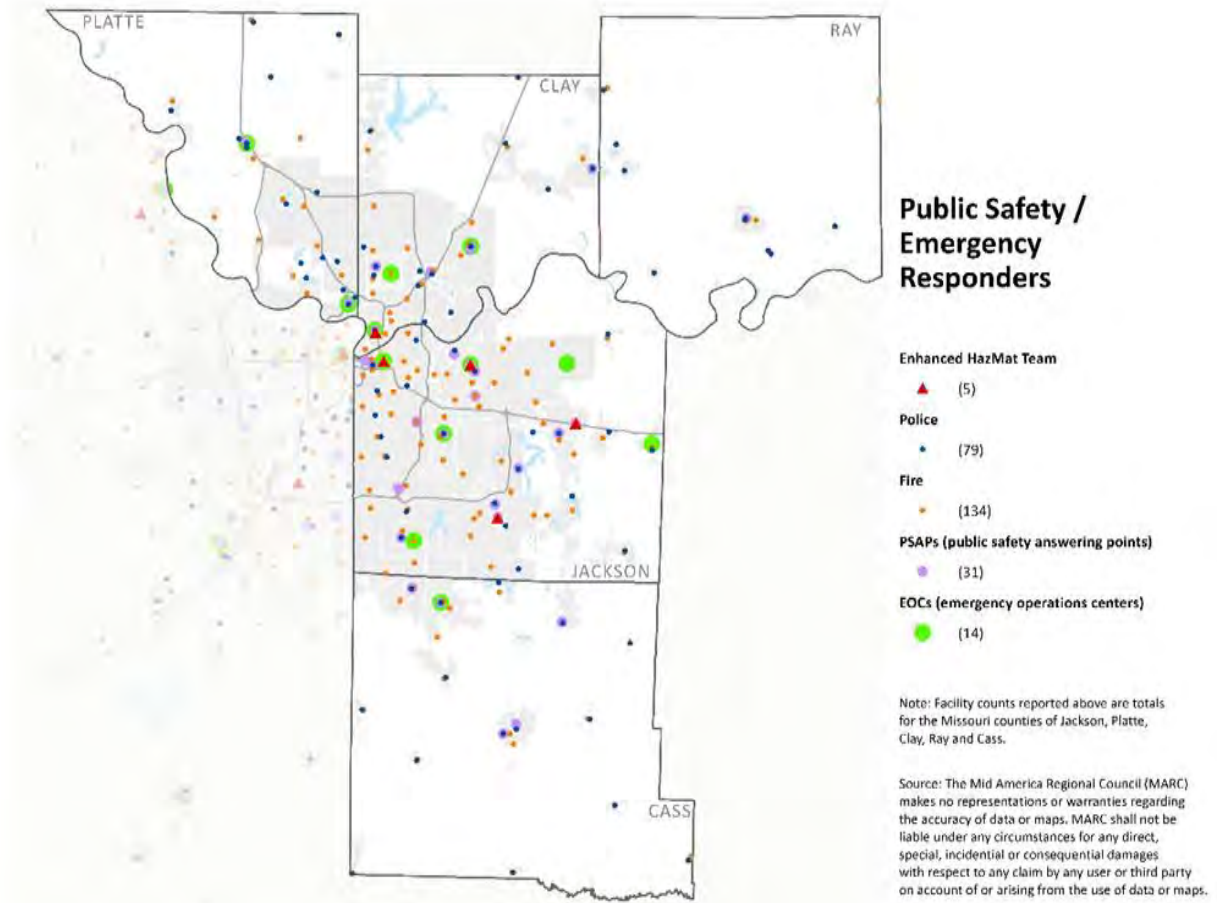
<b>Table 2.14: Critical Facility Types</b>							
<b>Asset (critical facility)</b>	<b>Cass</b>	<b>Clay</b>	<b>Jackson</b>	<b>Platte</b>	<b>Ray</b>	<b>Planning Area</b>	<b>Kansas City</b>
Day Care	49	92	331	29	6	<b>507</b>	231
Nursing Home	10	21	85	12	0	<b>128</b>	72
Public Housing	0	145	574	31	84	<b>834</b>	587
School	47	84	276	37	12	<b>456</b>	193
College	1	6	53	7	0	<b>67</b>	48
Hospital	2	6	17	1	1	<b>27</b>	15
Other Health Facility	23	41	153	14	7	<b>238</b>	98
Police	15	16	25	17	9	<b>82</b>	13
Fire	17	26	67	17	7	<b>134</b>	37
PSAP	5	6	15	2	1	<b>29</b>	5
Local (city, county, other) Government	13	12	13	13	6	<b>57</b>	1
Shopping Center	38	117	303	36	8	<b>502</b>	186
Grocery (large, small, farmers)	13	42	142	12	1	<b>210</b>	110
Airport	13	8	10	10	4	<b>45</b>	3
Amtrak	0	0	2	0	0	<b>2</b>	1
Heliport	1	3	15	2	0	<b>21</b>	14
Hotels	8	40	133	39	0	<b>220</b>	136
Apartments	51	192	1727	101	9	<b>2080</b>	1524
Trailer Parks	5	6	10	2	0	<b>23</b>	8
NFL stadium	0	0	1	0	0	<b>1</b>	1
MLB Stadium	0	0	1	0	0	<b>1</b>	1
Arena or Convention Center	0	0	3	0	0	<b>3</b>	2
Tier II	110	213	584	116	41	<b>1064</b>	451
RMP	6	3	9	4	4	<b>26</b>	8
Waste Water Treatment	16	13	19	16	9	<b>73</b>	7
<b>Total</b>	<b>443</b>	<b>1092</b>	<b>4568</b>	<b>518</b>	<b>209</b>	<b>6830</b>	<b>3752</b>

Source: MARC from City and county governments data.



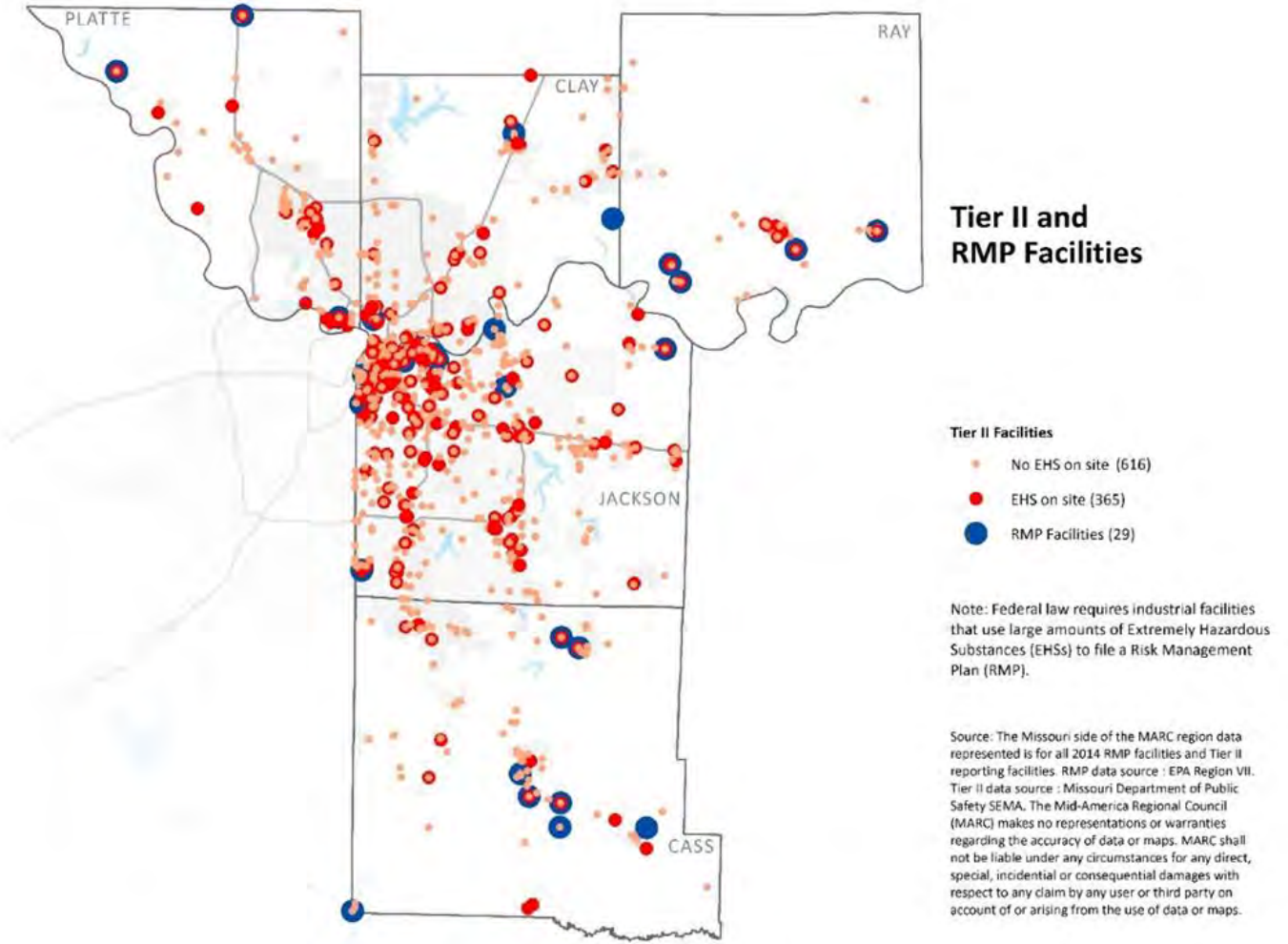
Source: City and county governments

**Figure 2.64: Government Facilities**



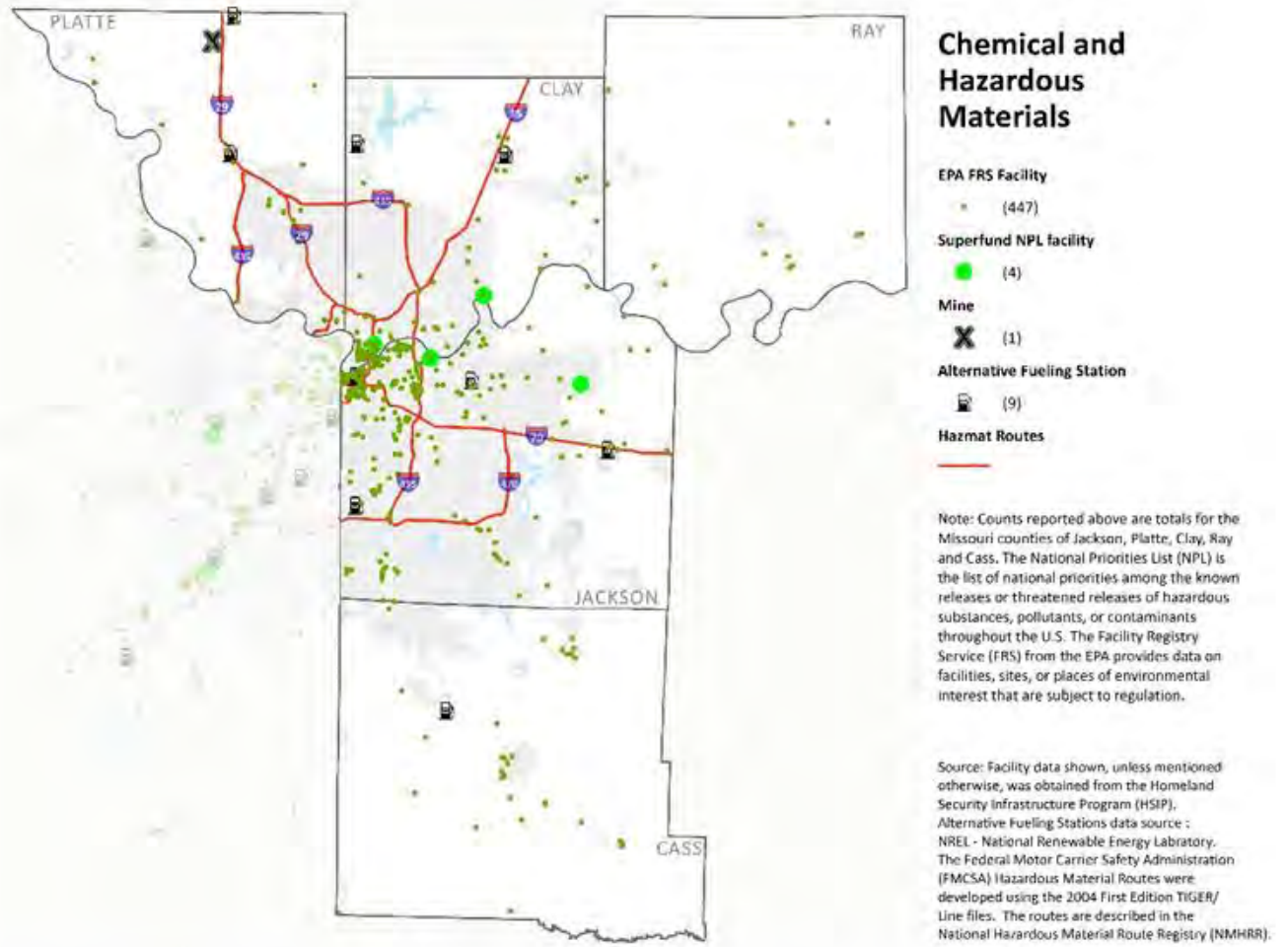
Source: City and county governments

**Figure 2.65: Public Safety/Emergency Responders**



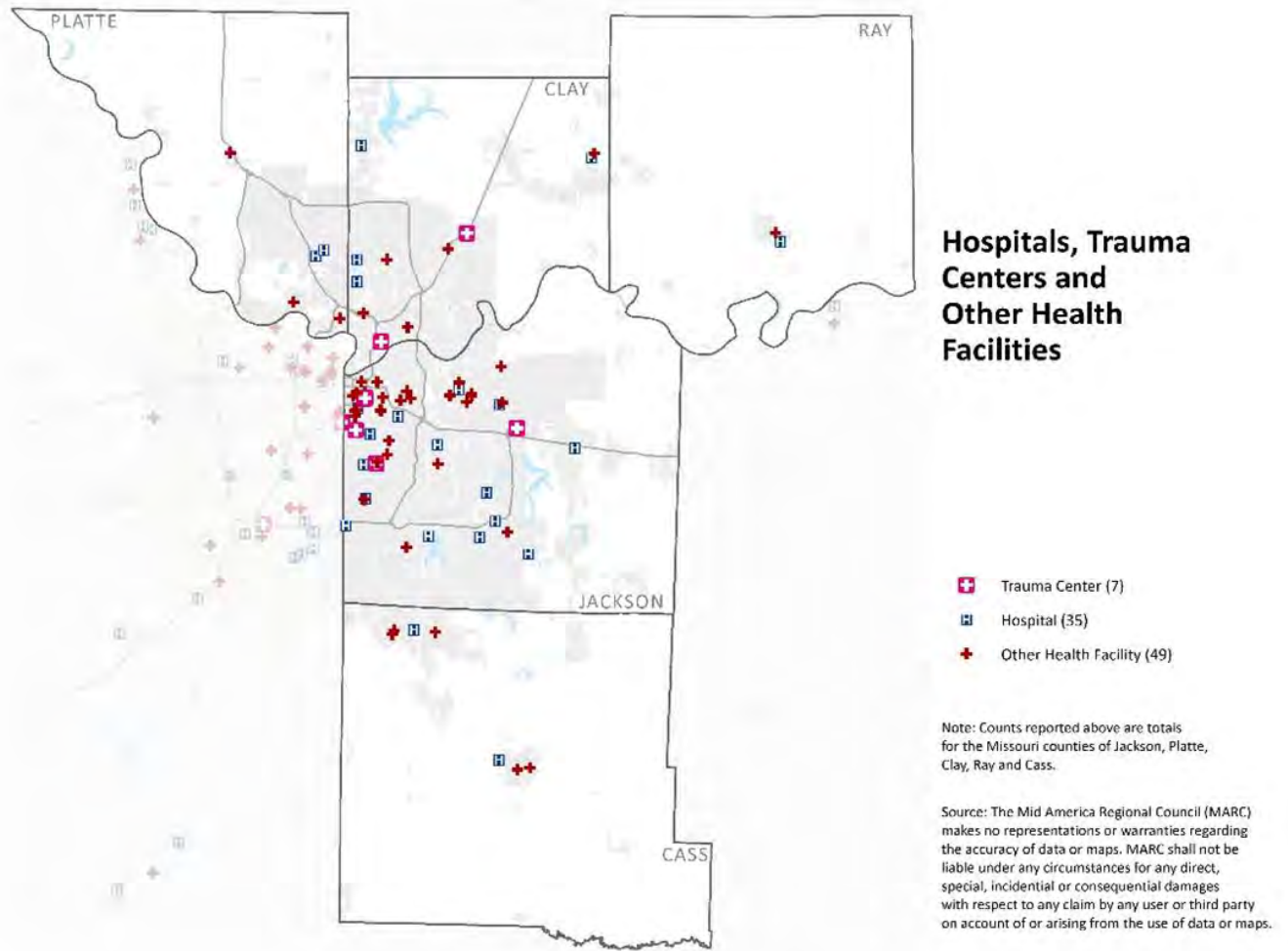
Source: City and county governments

**Figure 2.66: Tier II and RMP Facilities**



Source: City and county governments

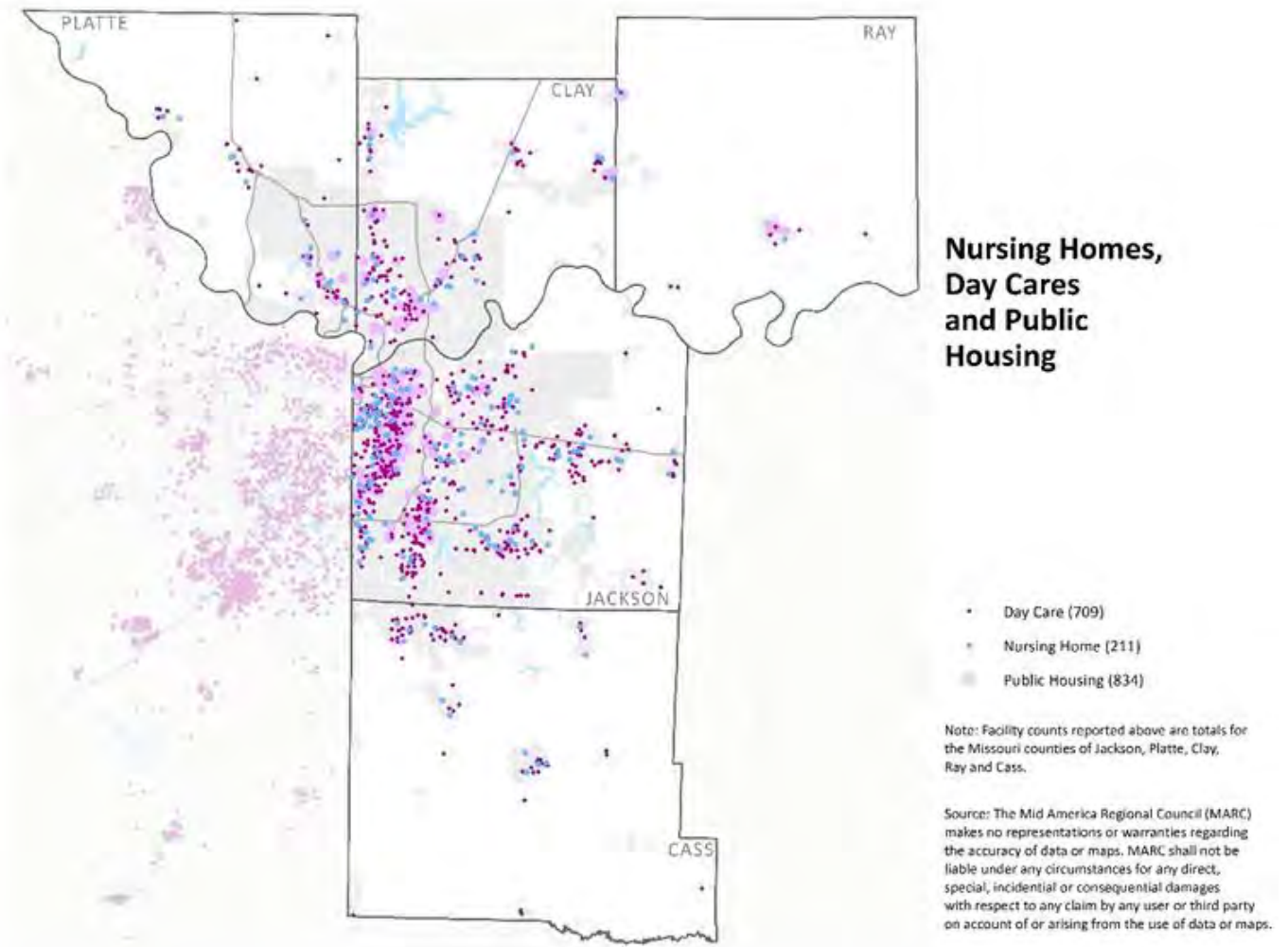
**Figure 2.67: Chemical and Hazardous Materials**



Source: City and county governments

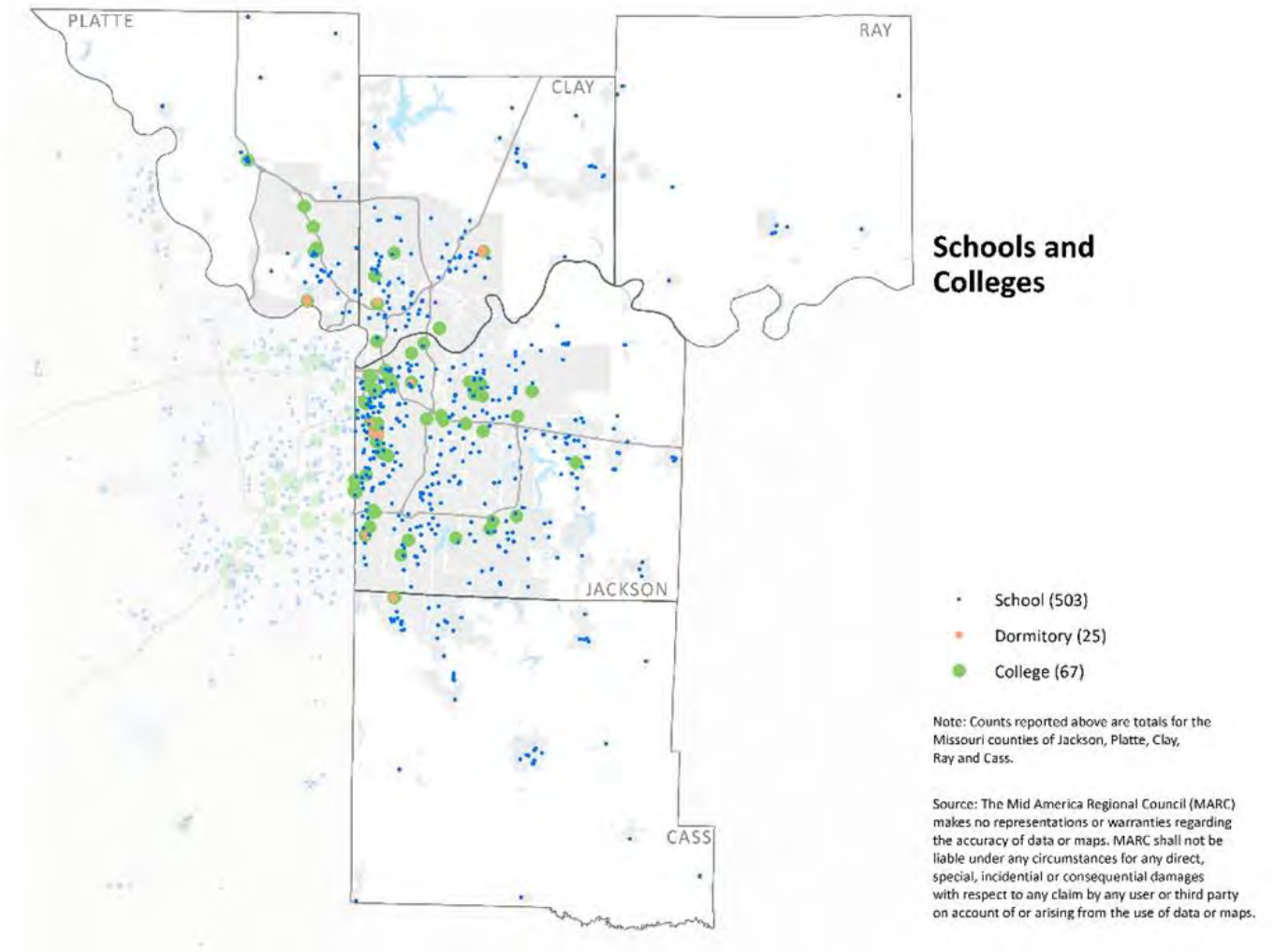
**Figure 2.68: Hospitals, Trauma Centers, and Other Health Facilities**





Source: City and county governments

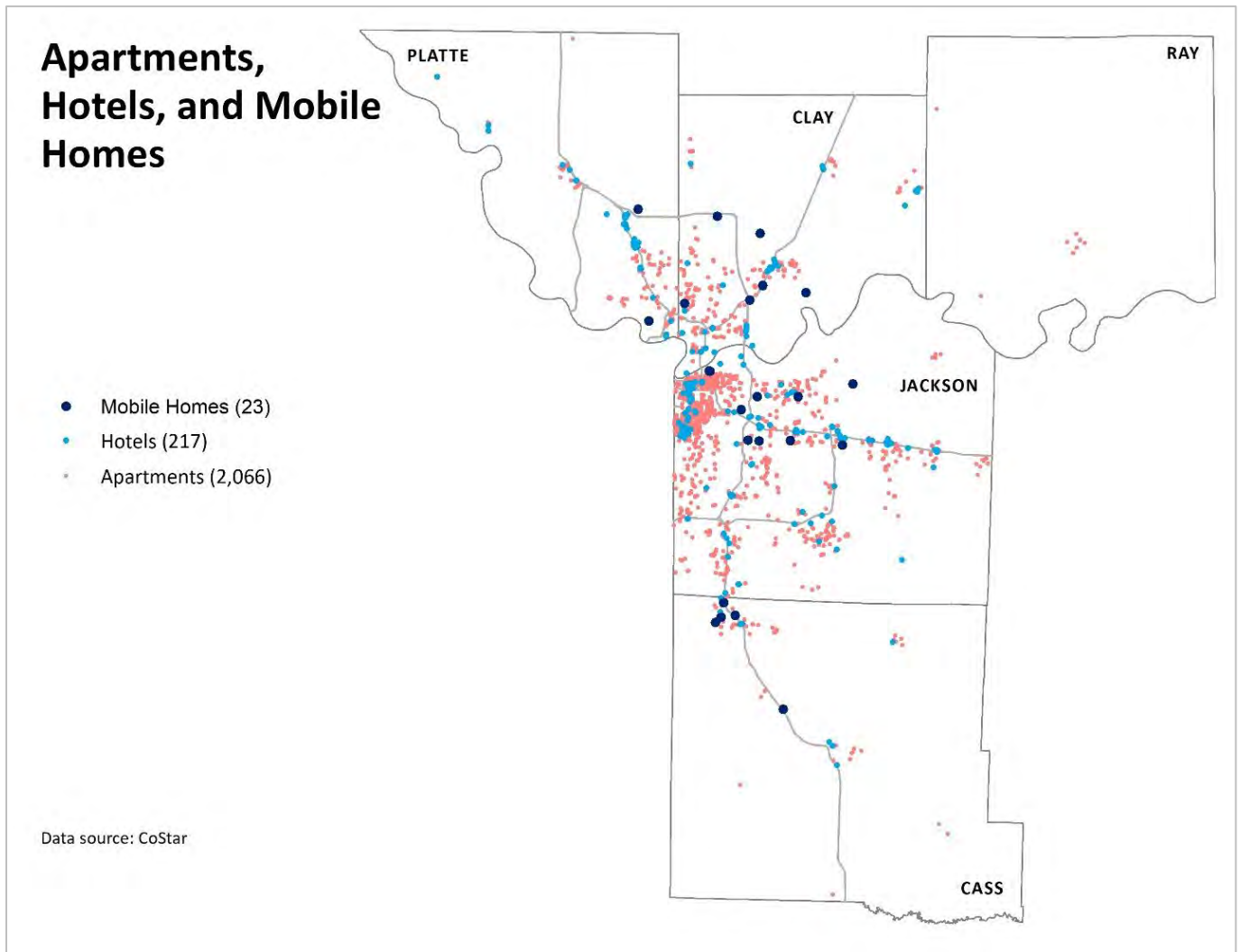
**Figure 2.69: Nursing Homes, Day Cares, and Public Housing**



Source: City and county governments

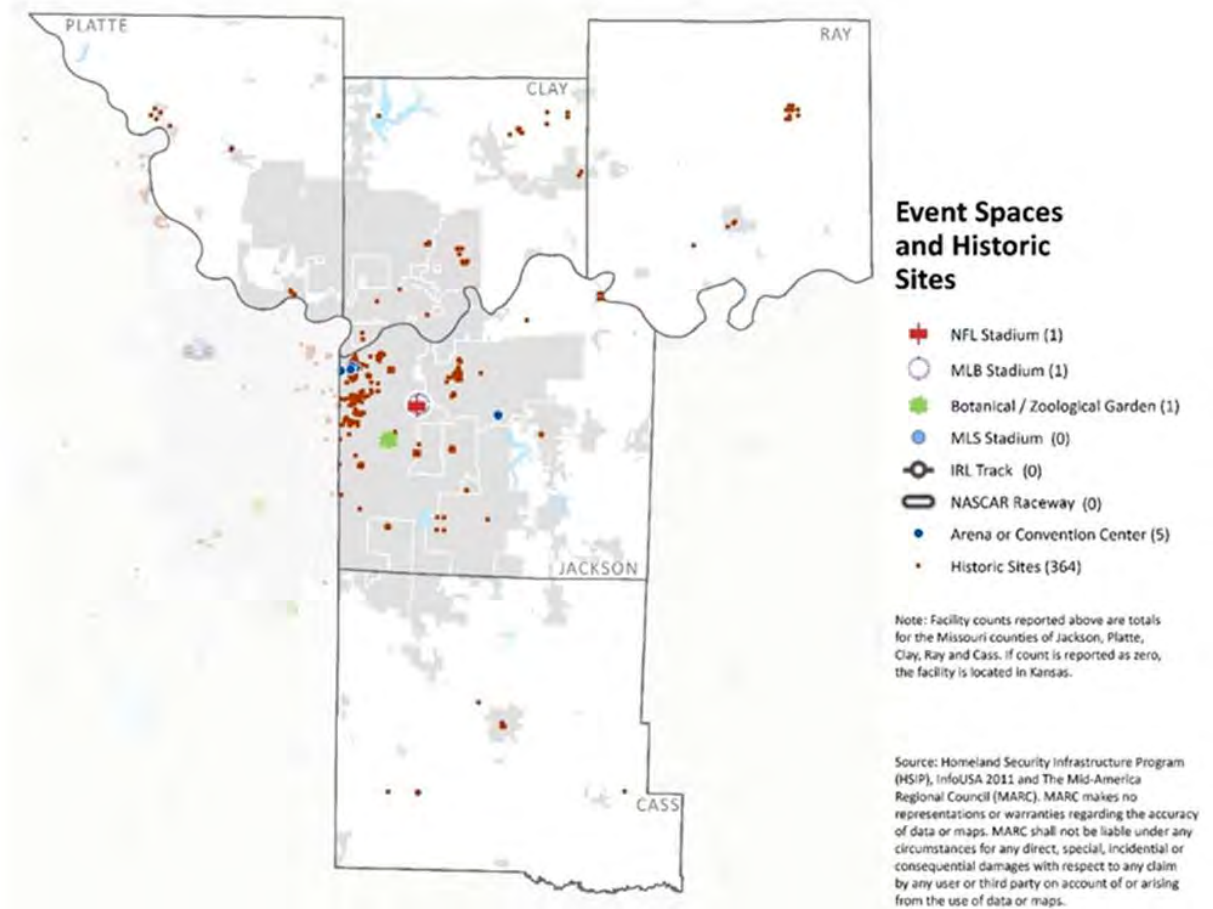
**Figure 2.70: Schools and Colleges**





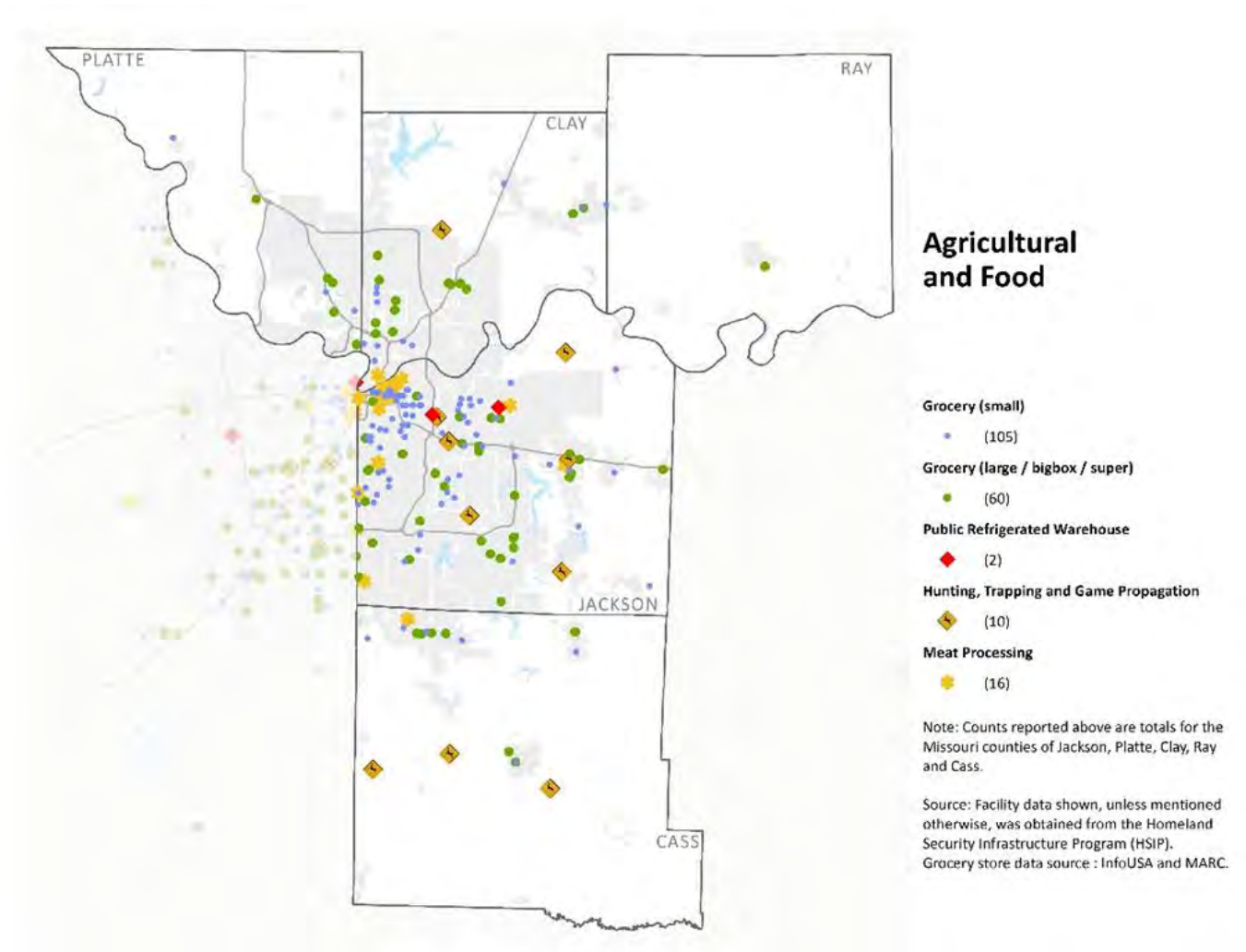
Source: City and county governments

**Figure 2.71: Apartments, Hotels, and Mobile Homes**



Source: City and county governments

**Figure 2.72: Event Spaces and Historic Sites**



Source: City and county governments

Figure 2.73: Agricultural and Food

## 2.8 Attachments

**Attachment Table 2.1:** Population by Age

**Attachment Table 2.2:** 2017 Population by Race/Ethnicity

**Attachment Map 2.1:** Unemployment (%)

**Attachment Map 2.2:** Population with High School Education or Less (%)

**Attachment Map 2.3:** Zero-Vehicle Households (%)

**Attachment Map 2.4:** Uninsured Population (%)

**Attachment Map 2.5:** Disabled Population (%)

**Attachment Map 2.6:** Veteran Population (%)

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<sup>i</sup> KC Rising , <http://www.kcrisingmetrics.org/jobs.htm>

<sup>ii</sup> KC Rising , <http://www.kcrisingmetrics.org/jobs.htm>

<sup>iii</sup> KC Rising, Big Dots, *Real Median Household Income (2016 dollars)*, <http://www.kcrisingmetrics.org/MHI.htm>

<sup>iv</sup> Bureau of Labor Statistics, Annual Averages U.S. Denver, Kansas City, and St. Louis, Consumer Price Indexes for All Urban consumers, [https://www.bls.gov/regions/mountain-plains/data/consumerpriceindexhistorical\\_selectedareas\\_table.htm](https://www.bls.gov/regions/mountain-plains/data/consumerpriceindexhistorical_selectedareas_table.htm)

<sup>v</sup> Federal Highway Administration, Highway Statistics 2015, <https://www.fhwa.dot.gov/policyinformation/statistics/2015/hm72.cfm>

<sup>vi</sup> Missouri Transportation by the Numbers Report, 2018 <[http://www.tripnet.org/Missouri\\_State\\_Info.php](http://www.tripnet.org/Missouri_State_Info.php)>

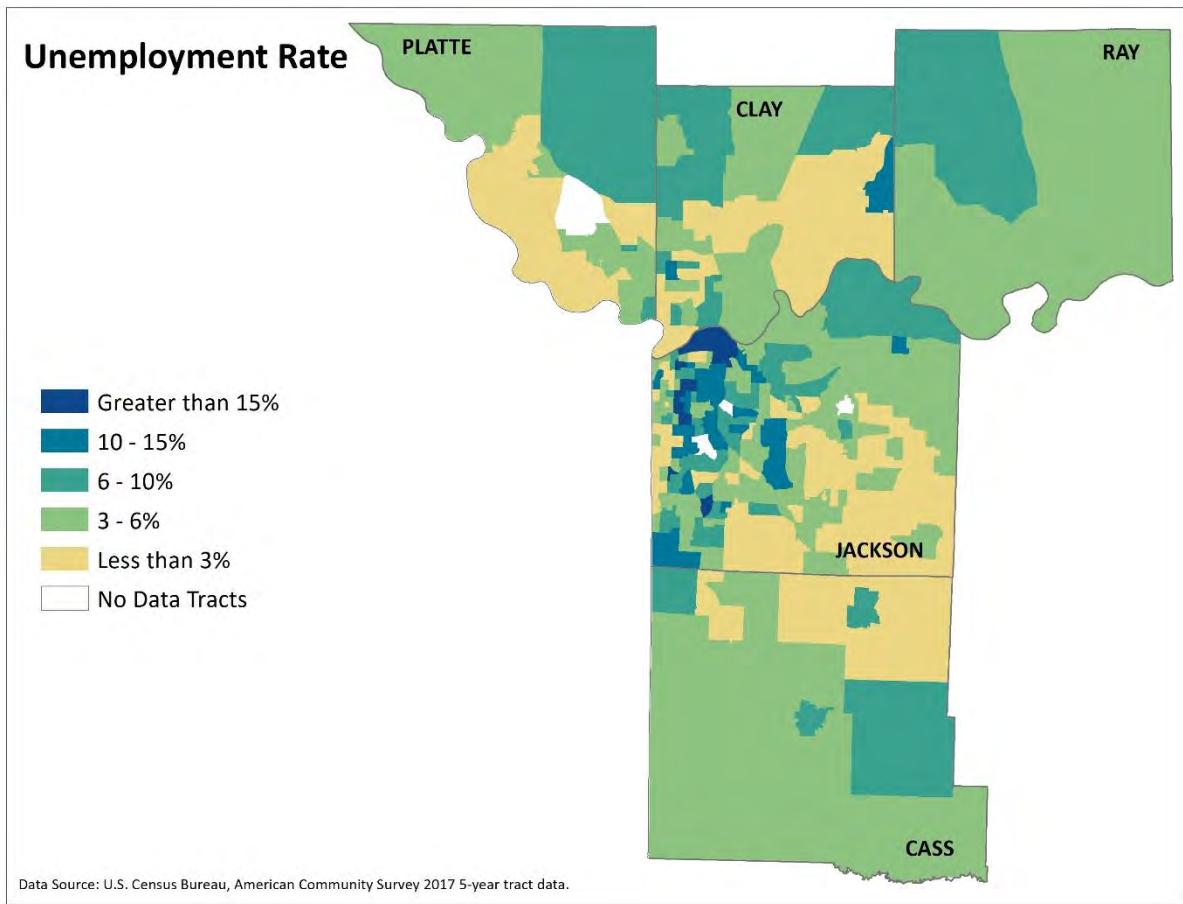
<sup>vii</sup> Missouri Transportation by the Numbers Report, 2018 <[http://www.tripnet.org/Missouri\\_State\\_Info.php](http://www.tripnet.org/Missouri_State_Info.php)>

<sup>viii</sup> Missouri Transportation by the Numbers Report, 2018 <[http://www.tripnet.org/Missouri\\_State\\_Info.php](http://www.tripnet.org/Missouri_State_Info.php)>

Attachment Table 2.1: Population by Age									
County	2010			2017			Change, 2010-2017		
	Median Age	% < 5 years	% 65+	Median Age	% < 5 years	% 65+	Median Age	< 5 years	65+ years
Cass	37.4	6.8%	13.1%	39.5	6.0%	15.7%	2.1	-0.8%	2.6%
Clay	36.0	7.4%	11.0%	36.8	6.6%	13.2%	0.8	-0.8%	2.2%
Jackson	36.1	7.2%	12.3%	36.6	6.8%	14.0%	0.5	-0.4%	1.7%
Platte	38.2	6.5%	10.8%	38.2	6.2%	13.5%	0	-0.3%	2.7%
Ray	39.6	6.4%	14.1%	41.8	5.8%	17.2%	2.2	-0.6%	3.1%
<b>Planning Area</b>	N/A	7.1%	12.0%	N/A	6.6%	14.0%	N/A	-0.5%	2.0%
Kansas City	34.9	7.5%	9%	35.2	7.0%	12%	N/A	-0.5%	3%

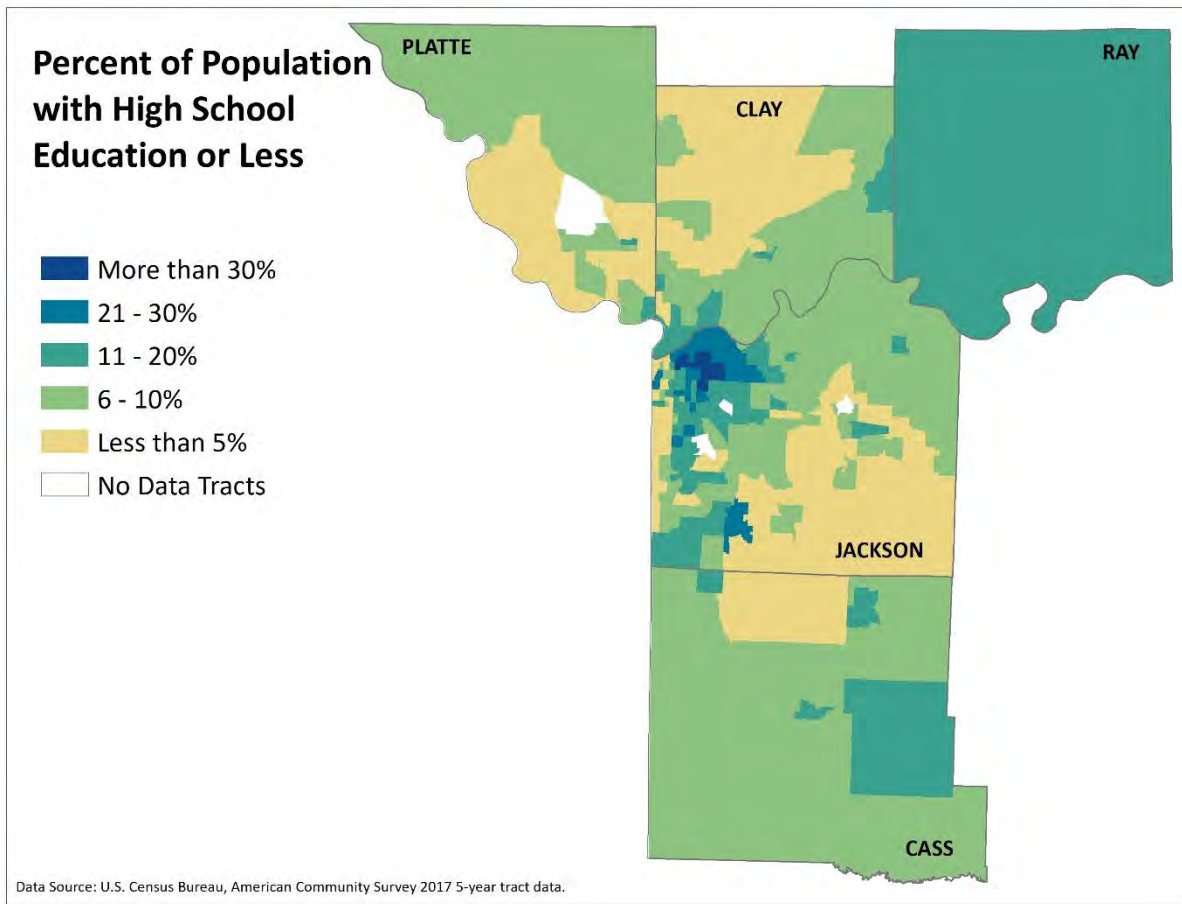
Attachment Table 2.2: 2017 Population by Race/Ethnicity								
		Cass	Clay	Jackson	Platte	Ray	Planning Area	Kansas City
2010	Total	97,598	215,015	666,997	86,894	23,667	1,090,171	454,876
	White	87,894	182,831	426,329	74,171	22,555	793,780	251,177
	All Minorities	9,704	32,184	240,668	12,723	1,112	296,391	203,973
	Black/ African American	3,007	7,430	159,309	4,512	299	174,557	135,169
	Hispanic/Latino (any race)	3,700	12,026	52,461	4,101	417	72,705	44,292
2017	Total	101,888	236,068	688,554	96,899	22,859	1,146,268	476,974
	White	90,204	193,763	430,411	79,450	21,478	815,306	264,602
	All Minorities	11,684	42,305	258,143	17,449	1,381	330,962	212,582
	Black/ African American	3,793	13,210	161,236	6,347	351	184,937	135,703
	Hispanic/Latino (any race)	4,302	15,590	60,846	5,601	534	86,873	48,521

Source: Census Bureau, American Community Survey 2017 5-year data



Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.1: Unemployment (%)**

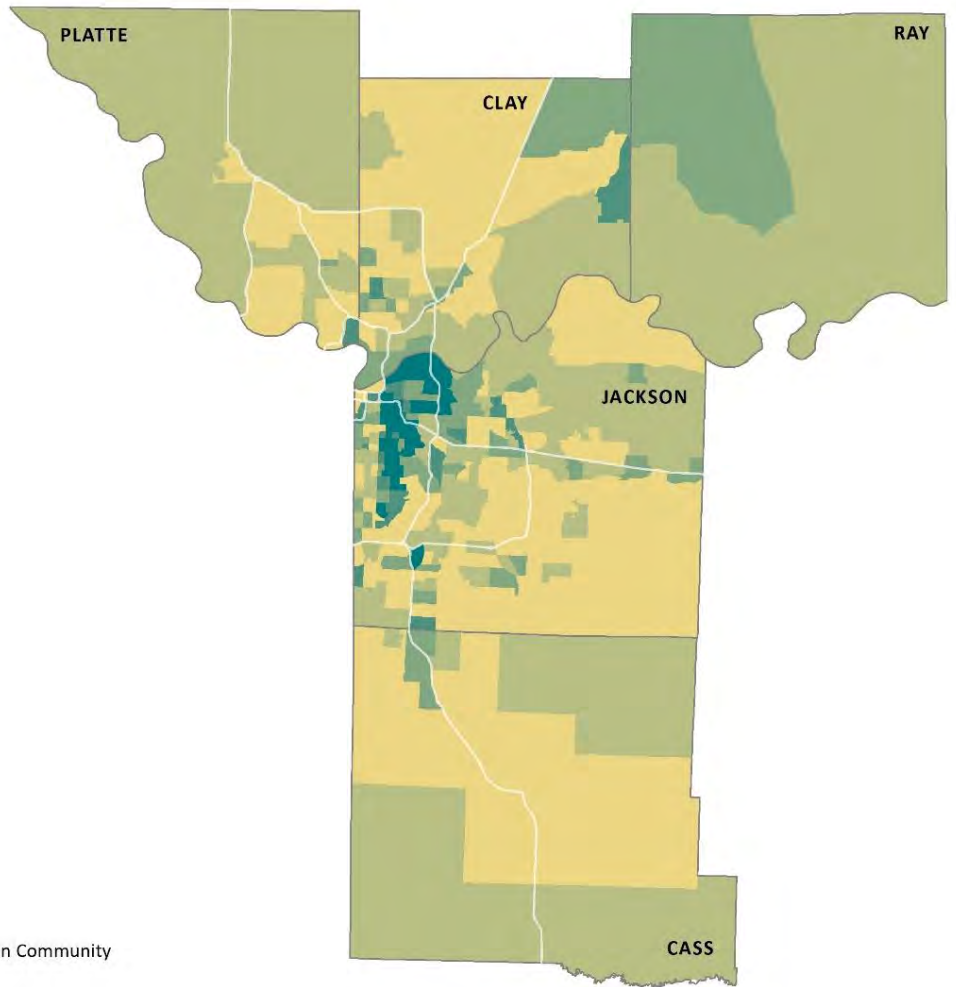
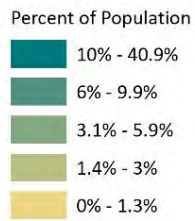


Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.2: Population with High School Education or Less (%)**



### Zero-Vehicle Households (%)

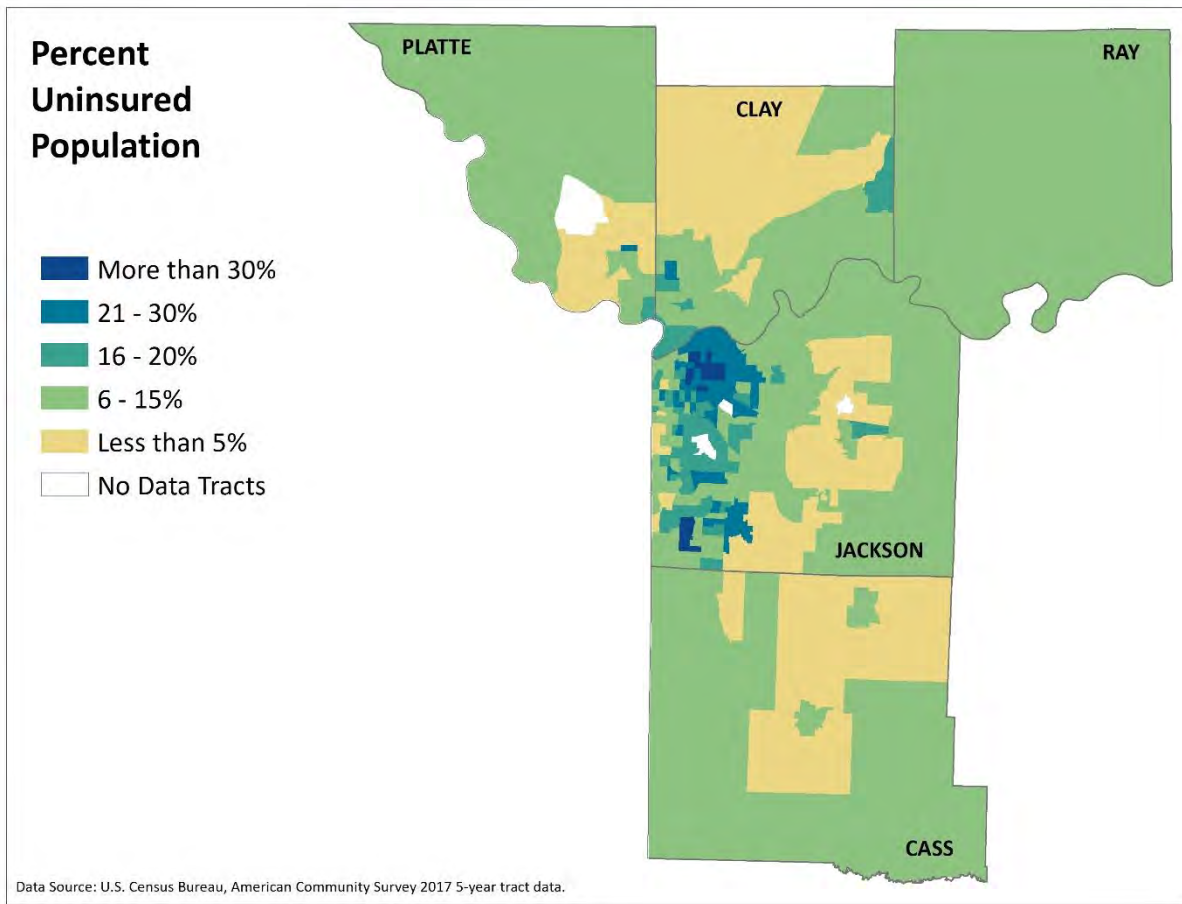


Data source: U.S. Census Bureau, American Community Survey 2017 5-year tract data.

Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.3: Zero-Vehicle Households (%)**

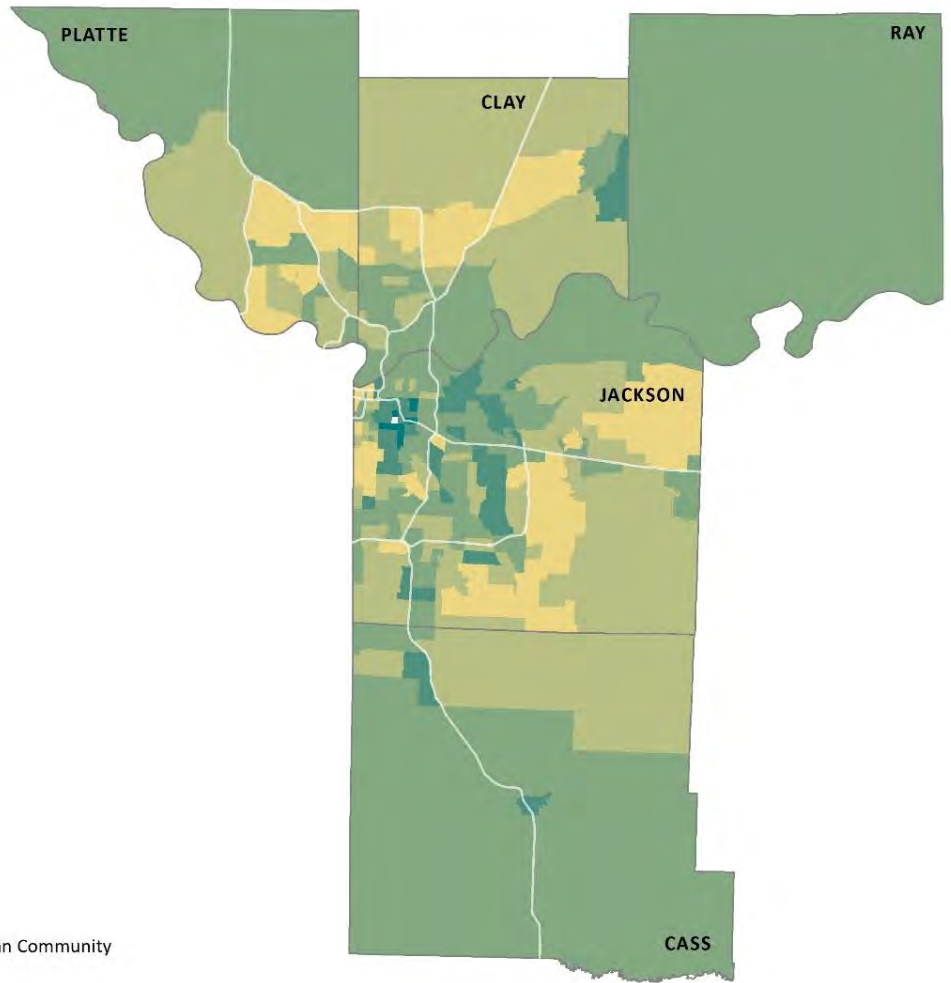
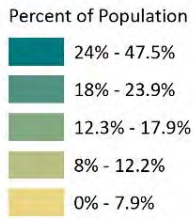




Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.4: Uninsured Population (%)**

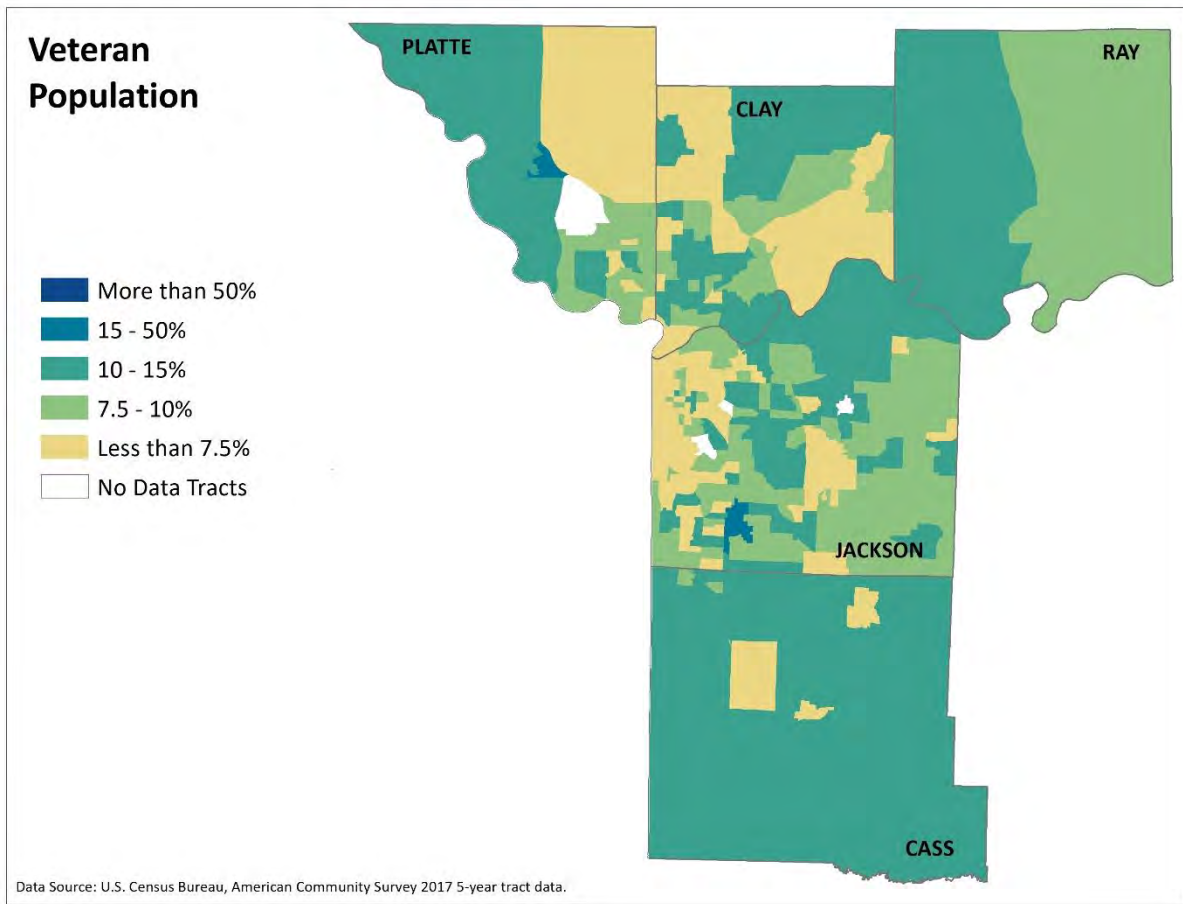
### Disabled Population (%)



Data source: U.S. Census Bureau, American Community Survey 2017 5-year tract data.

Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.5: Disabled Population (%)**



Source: Census Bureau, 2017 American Community Survey, 5-year data

**Attachment Map 2.6: Veteran Population (%)**

## Section 3: Capabilities Assessment

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## Section 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.<sup>i</sup> 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, gather information on safe growth audit and 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 2020 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 2020 profile survey used the 2015 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, 38 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.

**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	2002		2014	2015	2004	2014
Capital Improvement Plan		2014	2014		2014	2019	2020	2014
Local Emergency Operations Plan	2017	2014	2014		2014	2019	2012	2018
Continuity of Operations Plan	2010	2014	2014		2019	2019		
Public Health Emergency Plan	2014							2014
Storm Water Management Plan	2012	2011			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
<b>RELATED PLANNING ACTIVITIES:</b>								
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 110gmt.. Stormwater runoff	Stream setback Soil & erosion Floodplain 110gmt.. Stormwater runoff; open space dedication	Soil & erosion Floodplain 110gmt.. Stormwater runoff; open space dedication	Floodplain mgmt.; open space dedication	Soil & erosion Floodplain 110gmt.. Stormwater runoff	Soil & erosion Floodplain 110gmt.. Stormwater runoff; open space dedication	Floodplain 110gmt.. Stormwater runoff; open space dedication	Stream setback Soil & erosion Floodplain 110gmt.. Stormwater runoff; open space dedication

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD
Comprehensive/Master Plan	2008	2009	2008	2016	2017	1999	2013	2016	2005	NA
Capital Improvement Plan		2019	2011						2014	
Local Emergency Operations Plan	2014	2012	2018	2009	2016	2012		2018		
Continuity of Operations Plan			2018	2009		2012				
Public Health Emergency Preparedness Plan	2014		2018					2012		
Storm Water Management Plan		2013	2018		2003					NA
Community Wildfire Protection Plan or Burn Ordinance	No	Yes	No	Yes		Yes	No	No	Yes	Yes
Brownfields Redevelopment	No	No	No	No		No	No	No	No	NA
Climate Change Adaption	No	No	No	No		No	No	No	No	NA
<b>RELATED PLANNING ACTIVITIES:</b>										
Building Codes adequately enforced	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	NA
Land Use Planning utilized by community	Existing & Future	Existing & Future	Existing & Future	Existing & Future	Existing	Existing & Future	No	Existing & Future	Existing & Future	NA
Zoning Ordinance	Yes	yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA
Subdivision Ordinance		Yes	Yes	Yes		Yes	No	Yes	Yes	NA
Natural Hazard-related Ordinance(s) adopted	Stream setback Soil & erosion Floodplain 111gmt. Stormwater runoff	Water 111gmt.111ve Stream setback Soil & erosion Floodplain 111gmt. Stormwater runoff	Floodplain 111gmt.. Stormwater runoff	Floodplain 111gmt.. Stormwater runoff	Stormwater 111gmt.; floodplain management	Stream setback Soil & erosion Floodplain 111gmt.	Floodplain 111gmt..	Soil & erosion Floodplain 111gmt.. Stormwater runoff	Soil & erosion Floodplain 111gmt.. Stormwater runoff	NA



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	2002		2018	1995	2005	2000	Adopted	NA	NA
Capital Improvement Plan	2010	2019	2019		2015	2020	2014	2018	2006		
Local Emergency Operations Plan	2014	2014	2013	2007	2015	2018	2004	2007	2014		2007
Continuity of Operations Plan	2012				2015	2019					
Public Health Emergency Preparedness Plan	2013				2012	2019					
Storm Water Management Plan	2013	2018	2018			2019	2014	2013			
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
<b>RELATED PLANNING ACTIVITIES:</b>											
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 112gmt.. Stormwater runoff Soil & erosion	Stream setback floodplain 112gmt.. stormwater runoff soil & erosion	Floodplain 112gmt.; open space dedication	Stream setback floodplain 112gmt.. stormwater runoff soil & erosion	Stream setback floodplain 112gmt.. stormwater runoff soil & erosion	Stream setback floodplain 112gmt.. stormwater runoff soil & erosion	Stream setback floodplain 112gmt.. stormwater runoff soil & erosion	Floodplain Mgmt Soil & Erosion; stormwater runoff, open space dedication	NA	NA

JURISDICTION HAS AN ADOPTED OR UPDATED PLAN	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville
Comprehensive/Master Plan	2010			2013			2010	2019
Capital Improvement Plan	2010					2019		2019
Local Emergency Operations Plan	2019	2019		2013	2019	2019	2010	2015
Continuity of Operations Plan	2010							2015
Public Health Emergency Preparedness Plan	2019	2012				2019		2015
Storm Water Management Plan	2004					2019		2019
Community Wildfire Protection Plan or Burn Ordinance	No	Burn	No	No	Burn	Burn	No	No
Brownfields Redevelopment	No	No	No	No	No	No	No	No
Climate Change Adaption	No	No	No	No	No	No	No	No
<b>RELATED PLANNING ACTIVITIES:</b>								
Building Codes adequately enforced	Yes	No	Yes		Yes	Yes	Yes	Yes
Land Use Planning utilized by community	Existing and Future	Existing	Existing				Existing	Existing & Future
Zoning Ordinance utilized by community	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Subdivision Ordinance utilized by community	Yes							Yes
Natural Hazard-related Ordinance(s) adopted	Stormwater runoff Floodplain 113gmt.. Stream setback soil & erosion	Stormwater runoff; Floodplain 113gmt... Stream setback	Floodplain mgmt	Floodplain mgmt	Stormwater runoff Floodplain 113gmt.. Soil & erosion	Floodplain 113gmt..	Stormwater runoff; Floodplain 113gmt..	Stormwater runoff Floodplain 113gmt.. 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	2012		2010		2003	2003	NA	NA
Capital Improvement Plan	2015		2019		2014	2014		
Local Emergency Operations Plan	2014	2014	2019		2010	2010		
Continuity of Operations Plan		2011						
Public Health Emergency Preparedness Plan	2012							
Storm Water Management Plan	2012	2010	2018					
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
<b>RELATED PLANNING ACTIVITIES:</b>								
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 114gmt.. 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	2000
Capital Improvement Plan		2014
Local Emergency Operations Plan	2017	1999
Continuity of Operations Plan		
Public Health Emergency Preparedness Plan		
Storm Water Management Plan	2005	1999
Community Wildfire Protection Plan	Yes	Yes
Brownfields Redevelopment	No	No
Climate Change Adaption	No	No
<b>RELATED PLANNING ACTIVITIES:</b>		
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
Natural Hazard-related Ordinance(s) adopted	Floodplain 115gmt.. Stormwater runoff Soil & erosion Stream setback	Floodplain 115gmt.. 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.

<b>Table 3.2: Local Plans and Regulations Adopted by Local Jurisdictions</b>	
<b>Plan or Regulation</b>	<b>Significance to Hazard Mitigation</b>
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. The 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 particular 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.
<b>Plan or Regulation</b>	<b>Significance to Hazard Mitigation</b>
Wetland Regulations	Helps jurisdictions maintain and protection 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 2020 Plan review process. Responses displayed in the 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

<b>Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)</b>	
<b>CAPABILITY</b>	<b>CASS COUNTY</b>
Capital Improvements Plan	Peculiar: Lake Dean Project Pleasant Hill: Includes plan for community shelter (tornado mitigation) Raymore: Inflow and infiltration system improvements (drought mitigation)
Emergency Operations Plan	Cass County is currently updating their LEOP Harrisonville: Updated every year (all hazards mitigation) Pleasant Hill: Includes plan for mitigation and recovery
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) Raymore: Foxhaven storm water improvements; Canter Road improvements. (flood mitigation)
Burn Ordinance	Pleasant Hill: adopted in 2019
<b>CAPABILITY</b>	<b>CLAY COUNTY</b>
Comprehensive Plan	Kearney: Recommends floodplains for open space and park land Mosby: Addresses floods and tornadoes
Emergency Operations Plan	Kearney: Draft emergency operations plan is headed by Kearney Fire (all hazards mitigation)
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)
<b>CAPABILITY</b>	<b>JACKSON COUNTY</b>
Comprehensive Plan	Grandview: Update in progress Kansas City: The city will prepare a new comprehensive plan over the next 2-3 years

<b>Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)</b>	
	Lee's Summit: Development and impact on infrastructure (all hazards mitigation) Oak Grove: Too numerous to list; in revision (all hazards mitigation)
Capital Improvements Plan	Lee's Summit: Storm water management and transportation (flood management) Oak Grove: Annually reviewed with budget; too numerous to list (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)
<b>CAPABILITY</b>	<b>PLATTE COUNTY</b>
Comprehensive Plan	Platte County: Supports ongoing mitigation projects. Parkville: Supports ongoing mitigation projects through resource preservation; setbacks; access strategies Platte City: Storm water sewers have been updated (flood mitigation) Riverside: 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 Houston Lake: Adopted; undergoing revision; complete by October 2015 (all hazards mitigation) 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

<b>Table 3.3: Relevant Measures Incorporated into HMP (Plans/Regulations)</b>	
	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 Dearborn, 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
Brownfields Redevelopment	Platte City: Community Center
<b>CAPABILITY</b>	<b>RAY COUNTY</b>
Emergency Operations Plan	Ray County: Reviewed to address threats and hazards
Stormwater Management Plan	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. Table 3.5 indicates if the code is adequately enforced and whether the code was reviewed as a part of the HMP update. Table 3.6 described how coded and other relevant measures were incorporated into the HMP by each jurisdiction. Similar tables provide an overview of ordinances and policies.

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
<b>Cass County</b>	IC	2006		IFC	2006		IMC	2006		IPC	2006					NEC	2005	
Belton	IBC	2012	4	IFC	2012	4	IMC	2012	4	IPC	2012	4	IBC	2012	4			
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				
<b>Clay County</b>	IBC	2012		IFC	2011		IMC	2011		IPC	2011					IRC		
Excelsior Springs	IBC	2012	5	IFC	2012	5	IMC	2012	5	IPC	2012	5		1992				
Gladstone	IBC	2015	2	IFC	2018	2	IMC	2015	2	IPC	2015	2	IBC	2015		NEC	2015	
Kearney	IBC	2012	9	IFC	2012	4	IMC	2012	9	IPC	2012	9				NEC	2012	9
Lawson	IBC	2006		NFC			IMC			IPC						NEC		
Liberty	IBC	2012		IFC	2012	2	IMC	2012		IPC	2012							
Mosby	IBC																	
North Kansas City	IBC	2018		IFC	2018	1	IMC	2018		IPC	2018					NEC	2018	
Smithville	IBC	2012	7				IBC	2012		IBC	2012		IPMC	2012				
Fishing River FPD																		
<b>Jackson County</b>	IBC	2010	5	IFC	2010	5	IMC	2010	5	IPC	2010	5						
Blue Springs	IBC	2012	4	IFC	2012	3	IMC	2012	4	IPC	2012	4	IBC	2012	4	IBC	2012	
Grandview	IBC	2012		IFC	2012		IMC	2012		IPC	2012					NEC	2010	
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	2012	4	IFC	2012	3	IMC	2012	4	IPC	2012	4	UCADB					
Oak Grove	IBC	2012	2	IFC	2012	2	IMC	2012	2	IPC	2012	2				NEC	2008	
Raytown	IBC	2018	5	IFC	2018	5	IMC	2018	5	IPC	2018	5	IPMC	2018	5	NEC	2017	5
Central JACO FPD																		
Sni Valley FPD	IBC	2003		IFC	2003		IMC	2003		IPC	2003			2003				2003
<b>Platte County</b>	IBC	2012	5	IFC	2003	2	IMC	2012	5	IPC	2012	5		1993				
Dearborn	IBC	2013	7	IFC	2014	5	IMC	2013										
Farley	IRC	2009																

**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
Ferrelview	IBC	2012					IBC	2012		IBC	2012		IBC	2012				
Houston Lake	IRC	2005		IRC	2005		IRC	2005		IRC	2005							
Lake Waukomis	IBC	2012	4	IFC	2018	4	IRC	2003		IRC	2003		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	IC	2018		IC	2018		IC	2018		IC	2018		IC	2018		IC	2011	
Tracy	IBC	2006	4	IBC	2006	4	IBC	2006	4	IBC	2006	4	IBC	2006	4	NEC	2011	4
Weatherby Lake	IRC	2009	3	IFC	2009	4	IRC	2009	3	IRC	2009	3	IRC	2009	3			
Weston	IBC	2000		IBC	2000		IBC	2000		IBC	2000		IBC	2000				
Northland RAD																		
West Platte FPD																		
<b>Ray County</b>	IBC	2015		IFC	2015		IMC	2015		IPC	2015					NEC	2014	
Richmond	IBC	2012	9	IFC	2012	9	IMC	2012	9	IPC	2012	9	IBC	2012	9	NEC	2011	9

- IC – International Code
- IBC – International Building Code
- IFC – International Fire Code
- 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

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
<b>Cass County</b>	IC	X		IFC	X		IMC	X		IPC	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			
<b>Clay County</b>	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				NEC	X	X
Lawson	IBC	X																
Liberty	IBC	X		IFC	X		IMC	X		IPC	X							
Mosby	IBC	X																
North Kansas City	IBC	X		IFC	X		IMC	X		IPC	X					NEC	X	
Smithville	IBC	X					IBC	X		IBC	X		IPMC					
Fishing River FPD																		
<b>Jackson County</b>	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
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
Central JACO FPD																		
Sni Valley FPD	IBC			IFC			IMC			IPC								

Table 3.5: Codes Reviewed Adequately Enforced (Continued)																		
Jurisdiction	Building			Fire			Mechanical			Plumbing			Dangerous Buildings			Other Codes		
<b>Platte County</b>	IBC	X	X				IMC	X	X	IPC	X	X			X			
Dearborn	IBC			IFC			IMC											
Farley	IRC	X																
Ferrelview	IBC	X					IBC	X		IBC	X		IBC	X				
Houston Lake	IRC	X		IRC	X		IRC	X		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					
Northland RAD																		
West Platte FPD																		
<b>Ray County</b>	IBC																	
Richmond	IBC	X		IFC	X		IMC	X		IPC	X		IBC	X		NEC	X	

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

- IC – International Code
- IBC – International Building Code
- IFC – International Fire Code
- 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

<b>Table 3.6: Relevant Measures Incorporated into HMP (Building Codes)</b>	
<b>CAPABILITY</b>	<b>CASS COUNTY</b>
Building Code	Pleasant Hill: Additional safe room standards established
Dangerous Building Code	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
<b>CAPABILITY</b>	<b>CLAY COUNTY</b>
Building Code	Kearney: 2012 IRC and IBC
Fire Code	Kearney: KRFPD has a Class 4
Dangerous Building Code	Excelsior Springs: City has local ordinance
Other Codes	Clay County: IRC Kearney: 2012 NEC; 2012 ISPSC North Kansas City: NEC
<b>CAPABILITY</b>	<b>JACKSON COUNTY</b>
Building Code	Grandview: Will update to 2018 by end of 2019 Kansas City: Will update by 3/1/2020
Fire Code Mechanical Code Plumbing Code	Grandview: Will update to 2018 by end of 2019
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: Will update NEC to 2018 by end of 2019 Independence: IFGC, IRC, NEC, IEBC Oak Grove: NEC; 2009 IFGC; Int'l Private Property
<b>CAPABILITY</b>	<b>PLATTE COUNTY</b>
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	Riverside: IC Tracy: NEC
<b>CAPABILITY</b>	<b>RAY COUNTY</b>
Other Codes	Richmond: NEC

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 Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD	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	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓

**Table 3.7: Ordinances and Policies Adopted by Local Jurisdictions (Continued)**

ORDINANCES ADOPTED BY JURISDICTION	Central Jackson County FPD	Sni Valley FPD	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD	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			✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓				✓

<b>Table 3.8: Relevant Measures Incorporated into HMP (Ordinances/Policies)</b>	
<b>CAPABILITY</b>	<b>CASS COUNTY</b>
Floodplain Management Ordinance	Lake Winnebago: City has adopted ordinances as part of the UDO
Soil and Erosion Ordinance	Lake Winnebago: City has adopted UDO Erosion Control Ordinances
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
Storm Water Runoff Ordinance	Lake Winnebago: Adopted in the current Building Codes
Flood Buyout	Raymore: No structures are within the flood hazard area (Supports continued NFIP participation)
Site Plan Review Requirements	Lake Winnebago: Required for all construction permit applications
<b>CAPABILITY</b>	<b>CLAY COUNTY</b>
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
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)
<b>CAPABILITY</b>	<b>JACKSON COUNTY</b>
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) Oak Grove: Uniform Development Code (UDC) (Supports continued NFIP participation) Oak Grove: Uniform Development Code (UDC) (Supports continued NFIP participation) Grandview: Update ordinance in January 2018
Soil and Erosion Ordinance	Grandview: Land disturbance permit greater than 1 acre Kansas City: MS4 Program Oak Grove: Follow Federal Clean Water Act
Burn Ordinance (i.e., farmland, prairie)	Oak Grove: Limited to 5 weeks in spring and 5 weeks in fall
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

<b>Table 3.8 Relevant Measures Incorporated into HMP (Ordinances/Policies) (Continued)</b>	
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
<b>CAPABILITY</b>	<b>PLATTE COUNTY</b>
Stream Setback Ordinance	Platte County: Planning and Zoning (Supports continued NFIP participation)
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 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) 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)
Flood Buyout	Platte County: Bean Lake 1993 (Supports continued NFIP participation)
Site Plan Review Requirements	Platte County: Planning and Zoning 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 3.99** provides a list of administrative functions fulfilled at the local level by each jurisdiction.

The profiles provide responses on: 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. Error! Reference source not found.0 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 Winnebago	peculiar	Pleasant Hill	Raymore	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD	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	Central Jackson County FPD	Sni Valley FPD	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD	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)	LOCAL STAFFING RESOURCES BY JURISDICTION																									
	Cass County	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD	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	PT	FT	FT		FT	FT	FT		FT	PT	FT	FT
Floodplain Administrator	FT	FT	PT	PT	PT	FT	PT	FT	FT	PT	FT	FT	PT	FT	PT	FT	FT		FT	FT	PT	PT	FT	FT	PT	PT
Emergency Manager	FT	PT	FT	PT	PT	FT	PT	FT	FT	PT	PT		PT	FT	FT	FT	FT		FT	PT	PT	PT	FT	FT	PT	FT
Community Planner	FT	FT	FT	PT	PT	FT	PT	FT	FT		FT	FT		FT	PT	FT	FT		FT	FT	FT		FT	PT	FT	
Civil Engineer		FT	FT	PT	PT	FT		FT			FT	FT	PT	FT	PT	PT			FT	FT	FT		FT	FT	FT	PT
Public Health Official	FT							FT		FT									FT				FT	FT	FT	
IT Support	FT	FT	FT	PT	PT	FT	PT	FT	FT		FT	PT	PT	FT	PT	FT	PT		FT	FT	FT		FT	FT	FT	PT
GIS Coordinator	FT	FT				PT	PT	FT	FT	FT	FT			FT		FT			FT	FT	PT		FT	FT	FT	PT

**Table 3.10: Local Staffing Resources by Jurisdiction (Continued)**

LOCAL STAFFING (FULL-TIME OR PART-TIME)	LOCAL STAFFING RESOURCES BY JURISDICTION (CONTINUED)																				
	Raytown	Central Jackson County FPD	Sni Valley FPD	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD	Ray County	Richmond
Chief Building Official	FT		PT	FT		PT	PT	PT	PT	FT	PT	PT	FT	PT		PT	PT			PT	FT
Floodplain Administrator	PT			FT	PT	PT	PT	PT	PT	PT	FT	FT		FT	PT	FT	FT			PT	FT
Emergency Manager	PT		FT	FT	PT	PT	PT	PT	FT	PT	FT	FT	FT	FT		FT	FT		FT	PT	PT
Community Planner	FT			FT							FT	FT		FT							FT
Civil Engineer	FT			FT					PT		PT	PT		FT		PT					
Public Health Official	PT			FT			PT				FT	FT	PT			FT			FT	FT	
IT Support	FT		PT	FT			PT	PT	FT	PT	PT	PT	PT	FT		PT	PT	PT	PT	PT	
GIS Coordinator	PT		PT	FT							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	Mosby	North Kansas City	Smithville	Fishing River FPD	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	✓					✓		✓	✓		✓			✓	✓		✓		✓	✓	✓		✓	✓	

**Table 3.11: Local Technical Resources by Jurisdiction (Continued)**

TECHNICAL RESOURCE USEFUL TO LOCAL PLANNING	Oak Grove	Raytown	Central Jackson County FPD	Sni Valley FPD	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD	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	✓				✓						✓	✓	✓		✓		✓			✓	✓		✓

<b>Table 3.12: Relevant Measures Incorporated into HMP (Technical Resources)</b>	
<b>CAPABILITY</b>	<b>CASS COUNTY</b>
Warning Systems	Cass Co: Everbridge mass notification system, social media Belton: VOIP System and warning systems Lake Winnebago: New/Upgraded 2013 Peculiar: Emergency sirens, social media, cellular announcements Pleasant Hill: multiple options include text alerts, reverse 911, opt in to Everbridge, and storm sirens
Hazard Data	Cass County: Information on LEOP and THIRA update completed in 2019 Belton: Full access to all utility data through GIS and Rain Gauge Peculiar: Gates for low water bridge crossings Lake Winnebago: maps available hard copy and digital Pleasant Hill: mapping capabilities; lightning detectors
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	Cass County: does not have 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
<b>CAPABILITY</b>	<b>CLAY COUNTY</b>
Warning Systems	Kearney: Used for tornadoes and severe weather Liberty: Warning sirens, mass texts to cell phones, email Smithville: Warning sirens
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
<b>CAPABILITY</b>	<b>JACKSON COUNTY</b>
Warning Systems	Independence: SMS Texting System and outdoor siren system Grandview: test sirens but not alerts Lee's Summit: Several mass public notification systems Oak Grove: Land development fee with building permit to expand service throughout community, continue to expand system Raytown: Outdoor warning sirens, weather radios and communication equipment Sni Valley FPD: District-owned outdoor warning siren in Bates City only
Hazard Data	Independence: Participated in THIRA update Kansas City, Mo: Information is contained within LEOP Oak Grove: Ongoing planning in LEOP Raytown: Awareness of historical data helps provide hazard analysis Sni Valley FPD: Reviewed for LEOP
Grant Writing	Sni Valley FPD: Using Fire Act and SAFER
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

<b>Table 3.12: Relevant Measures Incorporated into HMP (Technical Resources)</b>	
	Oak Grove: Ongoing GIS data project Sni Valley FPD: GIS database Grandview: does not have existing land use map
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
SHMP	Kansas City, Mo: Reviewed and incorporated into the LEOP Sni Valley FPD: Reviewed for LEOP
<b>CAPABILITY</b>	<b>PLATTE COUNTY</b>
Warning Systems	Platte County: sets off all sirens in county Dearborn: Tornado siren during severe weather Houston Lake: sirens and weather radios are providing warning systems for county and Riverside Parkville: 4 sirens and weather radios in all city buildings Platte City: NIXLE used to notify residents for all types of events Riverside: Use social media sites and textcaster Weatherby Lake: 2 weather sirens operated by the county
Hazard Data	Platte County: Updated from 2015 Parkville: Flood hazard data; new data acquired in 2014 (Supports continued participation in the NFIP) Northland RAD: Data is kept at county level and through dispatch software Weatherby Lake: Use mitigation tool to plan for future events
Grant Writing	Platte County: Several staff in department to help in the process Dearborn: Grant for parks, buildings, city improvement Parkville: Previous used in flood mitigation (Supports continued participation in NFIP) Platte City: In-house person does all types of grants Riverside: Grant writing resources available on an as-needed basis Weatherby Lake: Work with storm water runoff and Park board for enhanced public use access
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 Dearborn: County and State have the plans to cover the city 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

<b>Table 3.12: Relevant Measures Incorporated into HMP (Technical Resources)</b>	
<b>CAPABILITY</b>	<b>RAY COUNTY</b>
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 existing 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.

<b>Table 3.13: Types of Mitigation Activities Funded by Funding Source</b>					
<b>Funding Resource</b>	<b>Structure and Infrastructure Projects</b>	<b>Local Plans and Regulations</b>	<b>Natural Systems Protection</b>	<b>Education and Awareness Programs</b>	<b>Total Mitigation Activities Funded</b>
Capital Improvement Project Funding	21	5	1	0	27
Authority to levy taxes for specific purposes	18	3	1	0	22
Fees for water, sewer, gas or electric services	16	5	0	0	21
Impact fees for new development	12	4	0	0	16
Storm water utility fee	7	3	0	0	10
Incur debt through general and/or special tax bonds	15	2	1	0	18
Incur debt through private activities	0	0	0	0	0
Community Development Block Grant	5	6	0	1	12
Flood Mitigation Assistance Program	5	3	3	1	12
Pre-Disaster Mitigation Program	3	5	0	2	10
Hazard Mitigation Grant Program	3	4	0	1	8
Other	4	0	0	0	4
<b><i>Type of Mitigation Activities Total)</i></b>	<b>109</b>	<b>40</b>	<b>6</b>	<b>5</b>	<b>160</b>

#### ***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** shows access or eligibility to use funding resources for hazard mitigation by jurisdiction.



**Table 3.14: Access or Eligibility to Use Funding Resource by Jurisdiction**

JURISDICTION HAS ABILITY TO ACCESS THESE FUNDING RESOURCES	Cass County	Belton	Harrisonville	Lake Annette	Lake Winnebago	Peculiar	Pleasant Hill	Raymore	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD	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	✓		✓	✓	✓	✓		✓	✓		✓	✓		✓	✓				✓	✓			✓		✓

JURISDICTION HAS ABILITY TO ACCESS THESE FUNDING RESOURCES	Oak Grove	Raytown	Central Jackson County FPD	Sni Valley FPD	Platte County	Dearborn	Farley	Ferrelview	Houston Lake	Lake Waukomis	Northmoor	Parkville	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD	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**

<b>PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES</b>	<b>Cass County</b>	<b>Belton</b>	<b>Harrisonville</b>	<b>Lake Annette</b>	<b>Lake Winnebago</b>	<b>Peculiar</b>	<b>Pleasant Hill</b>	<b>Raymore</b>	<b>Clay County</b>	<b>Excelsior Springs</b>	<b>Gladstone</b>	<b>Kearney</b>	<b>Lawson</b>	<b>Liberty</b>	<b>Mosby</b>	<b>North Kansas City</b>	<b>Smithville</b>	<b>Fishing River FPD</b>
<b>Existing Warning Systems</b>																		
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mass notification systems	✓		✓	✓	✓	✓	✓	✓				✓	✓	✓				
CMAS	✓													✓				
MEMC Project Community Alert	✓				✓						✓			✓				
National Weather Service	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Kansas City Scout	✓	✓	✓			✓								✓	✓			
<b>Community Partnerships</b>																		
Regional Homeland Security Coordinating Committee	✓				✓				✓			✓		✓		✓		✓
Metropolitan Emergency Managers Committee	✓	✓			✓	✓		✓	✓	✓	✓			✓				
Mid-America Local Emergency Planning Committee	✓	✓	✓		✓	✓		✓	✓	✓	✓			✓				
Mid-America Regional Council Emergency Rescue Committee		✓	✓							✓	✓	✓		✓		✓		
Metropolitan Official Health Agencies of the Kansas City Area	✓								✓		✓			✓				
Regional 9-1-1 System	✓	✓					✓	✓	✓	✓	✓	✓		✓				
SAVE Coalition	✓				✓											✓		
Kansas City Organizations Active in Disaster	✓				✓													
Community Emergency Response Team		✓	✓	✓	✓			✓	✓		✓			✓	✓	✓		
Medical Reserve Corps of Greater Kansas City	✓				✓			✓	✓		✓			✓				
<b>Ongoing public education or information program</b>	✓	✓			✓	✓	✓	✓	✓		✓					✓		
<b>Natural disaster or safety-related school program</b>	✓	✓				✓	✓	✓					✓	✓				
<b>StormReady certification</b>	✓	✓				✓		✓			✓			✓				✓
<b>Firewise Communities certification</b>						✓								✓				
<b>Public-private partnership initiatives (disaster-related)</b>		✓			✓		✓	✓						✓				
<b>Media coverage and public awareness</b>	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓		✓

<b>Table 3.15: Useful Outreach and Awareness Programs for Mitigation Activities by Jurisdiction (Continued)</b>																		
<b>PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES</b>	<b>Jackson County</b>	<b>Blue Springs</b>	<b>Grandview</b>	<b>Greenwood</b>	<b>Independence</b>	<b>Kansas City, MO</b>	<b>Lee's Summit</b>	<b>Oak Grove</b>	<b>Raytown</b>	<b>Central Jackson County FPS</b>	<b>Sni Valley FPD</b>	<b>Platte County</b>	<b>Dearborn</b>	<b>Edgerton</b>	<b>Farley</b>	<b>Ferrelview</b>	<b>Houston Lake</b>	<b>Lake Waukomis</b>
<b>Existing Warning Systems</b>																		
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Mass notification systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
CMAS	✓						✓	✓		✓	✓							
MEMC Project Community Alert	✓				✓		✓	✓	✓	✓	✓	✓						
National Weather Service	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Kansas City Scout	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓					
<b>Community Partnerships</b>																		
Regional Homeland Security Coordinating Committee	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Metropolitan Emergency Managers Committee	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Mid-America Local Emergency Planning Committee	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Mid-America Regional Council Emergency Rescue Committee		✓	✓		✓	✓	✓	✓		✓	✓			✓				
Metropolitan Official Health Agencies of the Kansas City Area	✓				✓	✓						✓	✓					
Regional 9-1-1 System	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
SAVE Coalition	✓	✓				✓		✓	✓	✓	✓	✓	✓				✓	
Kansas City Organizations Active in Disaster	✓				✓	✓		✓	✓	✓	✓	✓	✓					
Community Emergency Response Team	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	
Medical Reserve Corps of Greater Kansas City	✓				✓			✓	✓			✓	✓					
<b>Ongoing public education or information program</b>	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓				✓	
<b>Natural disaster or safety-related school program</b>	✓			✓			✓	✓	✓	✓	✓	✓	✓					
<b>StormReady certification</b>	✓				✓	✓	✓					✓	✓					
<b>Firewise Communities certification</b>																		
<b>Public-private partnership initiatives (disaster-related)</b>	✓			✓														
<b>Media coverage and public awareness</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	

<b>Table 3.15: Useful Outreach and Awareness Programs for Mitigation Activities by Jurisdiction (Continued)</b>												
<b>PROGRAM/ORGANIZATION IS USEFUL TO IMPLEMENT MITIGATION STRATEGIES</b>	<b>Northmoor</b>	<b>Parkville</b>	<b>Platte City</b>	<b>Platte Woods</b>	<b>Riverside</b>	<b>Tracy</b>	<b>Weatherby Lake</b>	<b>Weston</b>	<b>Northland RAD</b>	<b>West Platte FPD</b>	<b>Ray County</b>	<b>Richmond</b>
<b>Existing Warning Systems</b>												
Storm sirens	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Mass notification systems	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
CMAS					✓		✓					
MEMC Project Community Alert		✓	✓		✓		✓					
National Weather Service	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Kansas City Scout	✓		✓		✓		✓					
<b>Community Partnerships</b>												
Regional Homeland Security Coordinating Committee	✓	✓	✓		✓		✓					
Metropolitan Emergency Managers Committee		✓	✓	✓	✓		✓				✓	
Mid-America Local Emergency Planning Committee		✓	✓		✓							
Mid-America Regional Council Emergency Rescue Committee					✓				✓			
Metropolitan Official Health Agencies of the Kansas City Area											✓	
Regional 9-1-1 System		✓			✓			✓			✓	✓
SAVE Coalition	✓		✓		✓		✓	✓				
Kansas City Organizations Active in Disaster	✓	✓	✓				✓	✓				
Community Emergency Response Team	✓	✓	✓				✓	✓				
Medical Reserve Corps of Greater Kansas City	✓	✓	✓		✓		✓					
<b>Ongoing public education or information program</b>	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
<b>Natural disaster or safety-related school program</b>			✓				✓	✓				✓
<b>StormReady certification</b>	✓	✓	✓		✓		✓	✓		✓		
<b>Firewise Communities certification</b>												
<b>Public-private partnership initiatives (disaster-related)</b>	✓	✓			✓			✓				
<b>Media coverage and public awareness</b>	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓

**Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources)**

<b>Outreach Resource</b>	<b>Cass County</b>
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
Firewise Certification	Peculiar: West Peculiar Fire District Chief 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
<b>Outreach Resource</b>	<b>Clay County</b>
Storm Sirens	Kearney: Used to communicate tornado warnings and other severe weather Liberty: utilized for outdoor notification for tornadic activity
Mass Notification Systems	Kearney: Kearney Police Department (KPD) participates in NIXEL and has an active Facebook page Lawson: text messaging and social media Liberty: Send mass texts and emails Clay County: NIXEL
CMAS	Kearney: KPD participates in NIXEL
National Weather Service	Kearney: MERS is received on KPD radios
Kansas City Scout	Kearney: Infrastructure being installed by MoDOT and expect availability of system in 2020 or 2021
Regional Homeland Security Coordinating Committee	Kearney Fire & Rescue Protection District (KFRPD) & KPD receive their notices
Mid-America Regional Council Emergency Rescue	Kearney: KFRPD participates in this organization and implements their activities

<b>Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources) (Continued)</b>	
<b>Outreach Resource</b>	<b>Clay County</b>
Community Emergency Response Team	Kearney: No such team in Kearney, though the KFRPD is considering
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
<b>Outreach Resource</b>	<b>Jackson County</b>
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
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

<b>Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources) (Continued)</b>	
<b>Outreach Resource</b>	<b>Jackson County</b>
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
Mid-America Emergency Managers Committee	Jackson County: Active member Independence: Attended by EP Staff Sni Valle FPD: Same as Oak Grove
Mid-America Local Emergency Planning Committee	Jackson County: Active member Independence: Attended by EP Staff Sni Valley FPD: Same as Oak Grove
Mid-America Regional Council Emergency Rescue Committee	Independence: EP considering attending Oak Grove: Provides planning for emergency medical response including ambulances and hospitals Sni Valley FPD: Same as Oak Grove
Metropolitan Official Health Agencies of the Kansas City Area	Health directors of city and county health departments participate
Regional 9-1-1 System	Jackson County: PSAPs at EJC EOC and Jackson County Sheriff's Office Sni Valley: Coordinates 911 center operations
SAVE Coalition	Oak Grove: SEMA sponsored damage assessment program using achitects, engineers, and building officials Sni Valley: Same as Oak Grove



**Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources) (Continued)**

Outreach Resource	Jackson County
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
Firewise Certification	Kansas City: Do not have this certification
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

<b>Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources (Continued))</b>	
<b>Outreach Resource</b>	<b>Platte County</b>
Storm Sirens	Platte County: Monthly tests and statewide testing Dearborn: Used in severe weather Houston Lake: Sirens from surrounding close communities are used to alert this community 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, facebook, twitter) Dearborn: School sends periodic notifications Houston Lake: Web, TextCaster, social media Lake Waukomis: Nixle, facebook Parkville: TextCaster Platte City: NIXLE Platte Wood: NIXLE Weatherby Lake: TextCaster; NIXLE
CMAS	Dearborn: City does not have its own CMAS and relies on the county Weatherby Lake: Available within the city limits and surrounding areas
MEMC Project Community Alert	Platte County: promote every year during storm seasons Dearborn: County provides this service 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

<b>Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources (Continued))</b>	
<b>Outreach Resource</b>	<b>Platte County</b>
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
Mid-America Emergency Managers Committee	Platte County: Emergency Management team are members Dearborn: Through the county Platte City: Through the county Weatherby Lake: Attend meetings on a regular basis
Mid-America Local Emergency Planning Committee	Platte County: Emergency Management is part of this Dearborn: Through the county Houston Lake: Open communication avenues and liaisons Platte City: Through the county Weatherby Lake: Attend meetings on a regular basis
Metropolitan Official Health Agencies of the Kansas City Area	Platte County Health Department is a member
Regional 9-1-1 System	Platte County: Platte County is a PSAP
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

<b>Table 3.16: Relevant Measures Incorporated into HMP (Education and Outreach Resources (Continued))</b>	
<b>Outreach Resource</b>	<b>Platte County</b>
Community Emergency Response Team	Platte County: Platte County has been involved in CERT since 2003 Dearborn: Through the county Houston Lake: Ongoing CERT team recruitment and part of Northland CERT Team 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 Dearborn: The region has this service Platte City: MARC Weatherby Lake: Aware of the group
Ongoing Public Education or Information Program	Platte County: Continued education throughout the year Dearborn: Through the county 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 Dearborn: School has this program Platte City: Platte County RIII Weatherby Lake: Park Hill School District
StormReady Certification	Platte County: 2019-2022 Dearborn: Through the county 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 Dearborn: County provides this service Platte City: City Administrator and use Platte County PIO Weatherby Lake: Local media works well with the community
<b>Outreach Resource</b>	<b>Ray County</b>
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.

<b>Table 3.17: Safe Growth Audit Summary for Cass County</b>	<b>Cass County</b>	<b>Belton</b>	<b>Harrisonville</b>	<b>Lake Annette</b>	<b>Lake Winnebago</b>	<b>Peculiar</b>	<b>Pleasant Hill</b>	<b>Raymore</b>
<b>Land Use</b>								
Land use policies define an urban services area.	✓		✓			✓		
Land use policies contain provisions for hazard zone identification.			✓			✓		
Land use policies discourage development and/or redevelopment within natural hazard areas.	✓	✓	✓			✓	✓	
The future land use map in the comprehensive plan clearly identifies natural hazard areas.			✓			✓		
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	✓		✓			✓	✓	
Land use policies require storm water engineering studies prior to development.	✓	✓	✓			✓	✓	
<b>Transportation</b>								
The transportation plan limits access to hazard areas.								
Transportation policy is used to guide future growth to safe locations.	✓		✓			✓		
Movement systems are designed to function under disaster conditions (e.g., evacuation).	✓		✓			✓		
<b>Environmental Management</b>								
Environmental systems that protect development from hazards are identified and mapped.						✓		✓
Environmental policies maintain and restore protective ecosystems.	✓		✓					✓
Environmental policies provide incentives to development located outside protective ecosystems.						✓		✓
<b>Public Safety</b>								
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.			✓			✓	✓	
Safety is explicitly included in the plan’s growth and development policies.			✓					
The monitoring and implementation section of the plan covers safe growth objectives.			✓			✓		
<b>Building Codes</b>								
The building code contains provisions to elevate construction to withstand hazard forces.	✓	✓	✓			✓	✓	✓
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.	✓	✓	✓			✓	✓	✓
The code contains safe room or storm shelter requirements.		✓	✓			✓	✓	

<b>Table 3.17: Safe Growth Audit Summary for Cass County (Continued)</b>		<b>Cass County</b>	<b>Belton</b>	<b>Harrisonville</b>	<b>Lake Annette</b>	<b>Lake Winnebago</b>	<b>Peculiar</b>	<b>Pleasant Hill</b>	<b>Raymore</b>
<b>Zoning Ordinance</b>									
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.		✓	✓				✓	✓	
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.		✓					✓	✓	✓
The zoning ordinance contains mitigation performance standards.		✓					✓		✓
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.		✓	✓				✓	✓	✓
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.		✓					✓		✓
<b>Subdivision Regulations</b>									
Subdivision regulations contain an adopted hazard disclosure.									✓
The regulations contain a provision for soil report evaluations.							✓		
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.		✓					✓	✓	✓
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.							✓		✓
The regulations allow density transfers where hazard exist.									
<b>Capital Improvement Program and Infrastructure Policies</b>									
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.							✓		
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.							✓		
The capital improvements program provides funding for hazard mitigation projects.			✓	✓	✓		✓	✓	
<b>Other</b>									
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.		✓		✓	✓		✓	✓	
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.		✓	✓	✓	✓		✓	✓	✓
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.		✓	✓	✓	✓		✓		

<b>Table 3.18: Safe Growth Audit Summary for Clay County</b>										
	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD
<b>Land Use</b>										
Land use policies define an urban services area.	✓	✓		✓		✓				
Land use policies contain provisions for hazard zone identification.				✓		✓	✓		✓	
Land use policies discourage development and/or redevelopment within natural hazard areas.	✓			✓		✓	✓		✓	
The future land use map in the comprehensive plan clearly identifies natural hazard areas.				✓		✓			✓	
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	✓			✓		✓			✓	
Land use policies require storm water engineering studies prior to development.	✓		✓	✓		✓		✓	✓	
<b>Transportation</b>										
The transportation plan limits access to hazard areas.			✓			✓				
Transportation policy is used to guide future growth to safe locations.	✓		✓	✓		✓				
Movement systems are designed to function under disaster conditions (e.g., evacuation).			✓			✓				
<b>Environmental Management</b>										
Environmental systems that protect development from hazards are identified and mapped.						✓				
Environmental policies maintain and restore protective ecosystems.				✓		✓				
Environmental policies provide incentives to development located outside protective ecosystems.				✓		✓				
<b>Public Safety</b>										
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.			✓	✓		✓	✓	✓		✓
Safety is explicitly included in the plan’s growth and development policies.			✓			✓			✓	✓
The monitoring and implementation section of the plan covers safe growth objectives.			✓			✓				✓
<b>Building Codes</b>										
The building code contains provisions to elevate construction to withstand hazard forces.	✓		✓	✓		✓	✓	✓	✓	
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.			✓	✓		✓		✓	✓	
The code contains safe room or storm shelter requirements.			✓	✓		✓				

<b>Table 3.18: Safe Growth Audit Summary for Clay County (Continued)</b>										
	Clay County	Excelsior Springs	Gladstone	Kearney	Lawson	Liberty	Mosby	North Kansas City	Smithville	Fishing River FPD
<b>Zoning Ordinance</b>										
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.	✓		✓	✓		✓	✓	✓	✓	
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.	✓			✓		✓		✓	✓	
The zoning ordinance contains mitigation performance standards.	✓		✓	✓		✓			✓	
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	✓		✓	✓		✓	✓			
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.			✓	✓		✓	✓		✓	
<b>Subdivision Regulations</b>										
Subdivision regulations contain an adopted hazard disclosure.			✓					✓		
The regulations contain a provision for soil report evaluations.									✓	
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.	✓		✓	✓		✓			✓	
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.				✓		✓			✓	
The regulations allow density transfers where hazard exist.				✓		☐			☐	
<b>Capital Improvement Program and Infrastructure Policies</b>										
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	✓		✓			✓			✓	
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	✓		✓			✓	✓		✓	
The capital improvements program provides funding for hazard mitigation projects.			✓			✓				
<b>Other</b>										
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.			✓			✓				
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.			✓			✓		✓		
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.						✓	✓			



<p align="center"><b>Table 3.19: Safe Growth Audit Summary for Jackson County</b></p>	Jackson County	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove	Raytown	Central JACO FPD	Sni Valley FPD
<b>Land Use</b>											
Land use policies define an urban services area.	✓	✓				✓			✓		
Land use policies contain provisions for hazard zone identification.	✓				✓	✓	✓	✓			
Land use policies discourage development and/or redevelopment within natural hazard areas.	✓	✓	✓		✓	✓	✓	✓	✓		
The future land use map in the comprehensive plan clearly identifies natural hazard areas.	✓	✓		✓	✓	✓	✓	✓	✓		
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	✓	✓	✓		✓		✓	✓			
Land use policies require storm water engineering studies prior to development.	✓	✓	✓		✓	✓	✓	✓	✓		
<b>Transportation</b>											
The transportation plan limits access to hazard areas.			✓				✓				
Transportation policy is used to guide future growth to safe locations.	✓	✓	✓				✓	✓			
Movement systems are designed to function under disaster conditions (e.g., evacuation).	✓	✓	✓					✓			
<b>Environmental Management</b>											
Environmental systems that protect development from hazards are identified and mapped.	✓				✓		✓	✓			
Environmental policies maintain and restore protective ecosystems.	✓				✓	✓	✓	✓	✓		
Environmental policies provide incentives to development located outside protective ecosystems.	✓						✓	✓			
<b>Public Safety</b>											
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.	✓				✓			✓			
Safety is explicitly included in the plan's growth and development policies.	✓				✓			✓			
The monitoring and implementation section of the plan covers safe growth objectives.	✓							✓			
<b>Building Codes</b>											
The building code contains provisions to elevate construction to withstand hazard forces.	✓	✓	✓		✓	✓		✓			✓
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.	✓	✓	✓		✓	✓	✓	✓			✓
The code contains safe room or storm shelter requirements.	✓	✓	✓		✓	✓		✓			✓

<b>Table 3.19: Safe Growth Audit Summary for Jackson County (Continued)</b>	Jackson County	Blue Springs	Grandview	Greenwood	Independence	Kansas City, MO	Lee's Summit	Oak Grove	Raytown	Central JACO FPD	Sni Valley FPD
<b>Zoning Ordinance</b>											
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.	✓	✓			✓	✓	✓	✓	✓		
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.	✓	✓			✓	✓	✓	✓	✓		
The zoning ordinance contains mitigation performance standards.		✓			✓			✓			
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	✓	✓	✓		✓	✓	✓	✓	✓		
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	✓	✓	✓		✓	✓		✓	✓		
<b>Subdivision Regulations</b>											
Subdivision regulations contain an adopted hazard disclosure.	✓	✓					✓	✓			
The regulations contain a provision for soil report evaluations.	✓	✓			✓			✓			
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.	✓	✓			✓	✓	✓	✓			
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	✓	✓			✓	✓	✓	✓			
The regulations allow density transfers where hazard exist.	✓	✓			✓	✓	✓				
<b>Capital Improvement Program and Infrastructure Policies</b>											
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	✓						✓				✓
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	✓				✓		✓				✓
The capital improvements program provides funding for hazard mitigation projects.	✓				✓		✓	✓			✓
<b>Other</b>											
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	✓	✓				✓	✓	✓			
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.	✓	✓			✓	✓		✓			✓
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.	✓		✓		✓	✓	✓				

<b>Table 3.20: Safe Growth Audit Summary for Platte County, Part 1</b>		<b>Platte County</b>	<b>Dearborn</b>	<b>Farley</b>	<b>Ferrelview</b>	<b>Houston Lake</b>	<b>Lake Waukomis</b>	<b>Northmoor</b>	<b>Parkville</b>
<b>Land Use</b>									
Land use policies define an urban services area.	✓								✓
Land use policies contain provisions for hazard zone identification.	✓					✓			✓
Land use policies discourage development and/or redevelopment within natural hazard areas.	✓			✓	✓	✓			✓
The future land use map in the comprehensive plan clearly identifies natural hazard areas.	✓			✓	✓				✓
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	✓						✓		✓
Land use policies require storm water engineering studies prior to development.	✓			✓			✓		✓
<b>Transportation</b>									
The transportation plan limits access to hazard areas.	✓					✓	✓		
Transportation policy is used to guide future growth to safe locations.	✓					✓	✓		✓
Movement systems are designed to function under disaster conditions (e.g., evacuation).	✓							✓	
<b>Environmental Management</b>									
Environmental systems that protect development from hazards are identified and mapped.	✓					✓	✓		
Environmental policies maintain and restore protective ecosystems.	✓						✓		
Environmental policies provide incentives to development located outside protective ecosystems.							✓		
<b>Public Safety</b>									
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.	✓					✓	✓	✓	✓
Safety is explicitly included in the plan’s growth and development policies.	✓					✓	✓	✓	✓
The monitoring and implementation section of the plan covers safe growth objectives.	✓						✓	✓	✓
<b>Building Codes</b>									
The building code contains provisions to elevate construction to withstand hazard forces.	✓					✓	✓	✓	✓
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.	✓					✓	✓	✓	✓
The code contains safe room or storm shelter requirements.	✓								

<b>Table 3.20: Safe Growth Audit Summary for Platte County, Part 1 (Continued)</b>		<b>Platte County</b>	<b>Dearborn</b>	<b>Farley</b>	<b>Ferrelview</b>	<b>Houston Lake</b>	<b>Lake Waukomis</b>	<b>Northmoor</b>	<b>Parkville</b>
<b>Zoning Ordinance</b>									
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.	✓			✓	✓	✓			
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.					✓				
The zoning ordinance contains mitigation performance standards.	✓					✓			
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	✓			✓	✓	✓			✓
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.					✓	✓			
<b>Subdivision Regulations</b>									
Subdivision regulations contain an adopted hazard disclosure.	✓								
The regulations contain a provision for soil report evaluations.						✓			
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.	✓					✓			
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	✓					✓			
The regulations allow density transfers where hazard exist.									
<b>Capital Improvement Program and Infrastructure Policies</b>									
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.						✓			
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	✓				✓	✓			
The capital improvements program provides funding for hazard mitigation projects.	✓					✓			✓
<b>Other</b>									
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	✓								✓
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.	✓								✓
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.						✓			✓

<b>Table 3.21: Safe Growth Audit Summary for Platte County, Part 2</b>		Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD
<b>Land Use</b>									
Land use policies define an urban services area.		✓							
Land use policies contain provisions for hazard zone identification.								✓	
Land use policies discourage development and/or redevelopment within natural hazard areas.	✓		✓				✓	✓	
The future land use map in the comprehensive plan clearly identifies natural hazard areas.			✓					✓	
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	✓		✓					✓	
Land use policies require storm water engineering studies prior to development.	✓	✓	✓	✓	✓	✓	✓	✓	
<b>Transportation</b>									
The transportation plan limits access to hazard areas.	✓								
Transportation policy is used to guide future growth to safe locations.	✓								
Movement systems are designed to function under disaster conditions (e.g., evacuation).									
<b>Environmental Management</b>									
Environmental systems that protect development from hazards are identified and mapped.	✓							✓	
Environmental policies maintain and restore protective ecosystems.	✓								
Environmental policies provide incentives to development located outside protective ecosystems.	✓								
<b>Public Safety</b>									
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.	✓	✓				✓		✓	
Safety is explicitly included in the plan's growth and development policies.	✓	✓				✓		✓	
The monitoring and implementation section of the plan covers safe growth objectives.	✓					✓	✓	✓	
<b>Building Codes</b>									
The building code contains provisions to elevate construction to withstand hazard forces.	✓	✓				✓	✓		
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.	✓	✓				✓			
The code contains safe room or storm shelter requirements.									

<p align="center"><b>Table 3.21: Safe Growth Audit Summary for Platte County, Part 2 (Continued)</b></p>	Platte City	Platte Woods	Riverside	Tracy	Weatherby Lake	Weston	Northland RAD	West Platte FPD
	<b>Zoning Ordinance</b>							
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.	✓	✓	✓			✓		
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.		✓				✓		
The zoning ordinance contains mitigation performance standards.	✓		✓					
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	✓		✓	✓		✓		
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	✓					✓		
<b>Subdivision Regulations</b>								
Subdivision regulations contain an adopted hazard disclosure.								
The regulations contain a provision for soil report evaluations.	✓					✓		
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.	✓					✓		
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	✓		✓		✓	✓		
The regulations allow density transfers where hazard exist.			✓					
<b>Capital Improvement Program and Infrastructure Policies</b>								
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	✓							
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	✓							
The capital improvements program provides funding for hazard mitigation projects.	✓		✓					
<b>Other</b>								
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.								
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.		✓	✓			✓		
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.	✓	✓	✓			✓		

<b>Table 3.22: Safe Growth Audit Summary for Ray County</b>		<b>Ray County</b>	<b>Richmond</b>
<b>Land Use</b>			
Land use policies define an urban services area.			✓
Land use policies contain provisions for hazard zone identification.		✓	
Land use policies discourage development and/or redevelopment within natural hazard areas.		✓	
The future land use map in the comprehensive plan clearly identifies natural hazard areas.		✓	✓
The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas.			✓
Land use policies require storm water engineering studies prior to development.		✓	✓
<b>Transportation</b>			
The transportation plan limits access to hazard areas.			
Transportation policy is used to guide future growth to safe locations.			
Movement systems are designed to function under disaster conditions (e.g., evacuation).			
<b>Environmental Management</b>			
Environmental systems that protect development from hazards are identified and mapped.			
Environmental policies maintain and restore protective ecosystems.			
Environmental policies provide incentives to development located outside protective ecosystems.			
<b>Public Safety</b>			
The goals and policies of the comprehensive plan are related to those of the Hazard Mitigation Plan.			
Safety is explicitly included in the plan’s growth and development policies.			
The monitoring and implementation section of the plan covers safe growth objectives.			
<b>Building Codes</b>			
The building code contains provisions to elevate construction to withstand hazard forces.		✓	✓
The code contains wind resistance provisions to strengthen construction to withstand hazard forces.		✓	✓
The code contains safe room or storm shelter requirements.			✓

<b>Table 3.22: Safe Growth Audit Summary for Ray County (Continued)</b>	<b>Ray County</b>	<b>Richmond</b>
<b>Zoning Ordinance</b>		
The zoning ordinance conforms to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas.	✓	✓
The ordinance contains natural hazard overlay zones or districts that set conditions for land use within such zones.	✓	
The zoning ordinance contains mitigation performance standards.		
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	✓	✓
Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	✓	
<b>Subdivision Regulations</b>		
Subdivision regulations contain an adopted hazard disclosure.		
The regulations contain a provision for soil report evaluations.	✓	
The regulations restrict the subdivision of land within or adjacent to natural hazard areas.	✓	
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.		
The regulations allow density transfers where hazard exist.		
<b>Capital Improvement Program and Infrastructure Policies</b>		
The capital improvements program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.		
Infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.		
The capital improvements program provides funding for hazard mitigation projects.		
<b>Other</b>		
Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	✓	
An evacuation and shelter plan is adopted to deal with emergencies from natural hazards.		
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards.		



### 3.3.6 Floodplain Management and NFIP Participation

All but one of the jurisdictions participating in the 2020 Plan are also participants in the National Flood Program. See **Table 3.23** for a list of participants. Weatherby Lake is in discussions with FEMA regarding participation.

<b>Table 3.23: National Flood Program (NFIP) Participation</b>					
<b>Participant</b>	<b>NFIP Participant</b>	<b>Good Standing</b>	<b>Compliance Issues</b>	<b>CAV (last 5 years)</b>	<b>Reason if not an NFIP Participant</b>
<b>Cass County</b>	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			
<b>Clay County</b>	X	X			
Excelsior Springs	X	X			
Gladstone	X	X			
Kearney	X	X			
Lawson	X	X			
Liberty	X	X			
Mosby	X	X			
North Kansas City	X	X		X	
Smithville	X	X			
<b>Jackson County</b>	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			
<b>Platte County</b>	X	X		X	
Dearborn	X	X			
Farley	X	X			
Ferrelview	X	X			
Houston Lake	X	X			
Lake Waukomis	X	X			
Northmoor	X	X			
Parkville	X	X			
Platte City	X	X			
Platte Woods	No				No SFHA; not in floodplain
Riverside	X	X		X	

<b>Table 3.23: National Flood Program (NFIP) Participation (Continued)</b>					
<b>Participant</b>	<b>NFIP Participant</b>	<b>Good Standing</b>	<b>Compliance Issues</b>	<b>CAV (last 5 years)</b>	<b>Reason if not an NFIP Participant</b>
Tracy	X	X			
Weatherby Lake	No				Plan currently under review
Weston	X	X		X	
<b>Ray County</b>	X	X		X	
Richmond	X	X			

CAV = Community Assistance Visit

Sources: FEMA Community Status Book/Community Profile Survey

**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.

<b>Table 3.24: NFIP Policy Statistics as of July 2019 by Jurisdiction</b>			
<b>Community</b>	<b>Policies In-force</b>	<b>Insurance In-force whole \$000</b>	<b>Written Premium In-force</b>
CASS COUNTY	50	13,402	46,172
CLAY COUNTY	22	5,653	21,186
JACKSON COUNTY	31	8,194	34,513
PLATTE COUNTY	101	23,479	70,713
RAY COUNTY	42	5,971	44,750
LEE'S SUMMIT, CITY OF	127	32,978	61,891
ARCHIE, CITY OF	1	350	565
BELTON, CITY OF	11	2,123	7,788
HARRISONVILLE, CITY OF	25	5,431	24,864
LAKE ANNETTE, CITY OF	4	n/a	n/a
LAKE WINNEBAGO, CITY OF	11	3,371	5,760
PECULIAR, CITY OF	12	1,840	13,583
PLEASANT HILL, CITY OF	34	3,372	29,815
RAYMORE, CITY OF	30	8,230	13,581
EXCELSIOR SPRINGS, CITY OF	12	3,165	30,446
GLADSTONE, CITY OF	36	6,937	43,513
INDEPENDENCE, CITY OF	200	41,452	207,725
KANSAS CITY, CITY OF	815	287,499	1,267,900
KEARNEY, CITY OF	17	5,161	16,823
LAWSON, CITY OF	1	99	1,206
LIBERTY, CITY OF	56	13,293	70,728
KEARNEY, CITY OF	2	584,300	905
MOSBY, CITY OF	16	1,884	29,406
NORTH KANSAS CITY, CITY OF	101	29,537	112,864
SMITHVILLE, CITY OF	77	15,186	78,011
BLUE SPRINGS, CITY OF	24	6,162	16,222
GRAIN VALLEY, CITY OF	29	7,376	15,740
GRANDVIEW, CITY OF	25	18,269	6,860
GREENWOOD, CITY OF	2	860	2,512
OAK GROVE, CITY OF	3	910	1,108
RAYTOWN, CITY OF	12	1,995	6,588
DEARBORN, CITY OF	3	150	1,977
EDGERTON, CITY OF	1	76	1,007
FARLEY, VILLAGE OF	4	1,230	3,994
FERRELVUE, VILLAGE OF	4	2,044	1,639
HOUSTON LAKE, CITY OF	1	144	1,319
LAKE WAUKOMIS	1	42	205
NORTHMOOR, CITY OF	1	500	3,676
PARKVILLE, CITY OF	29	8,992	39,302
PLATTE CITY, CITY OF	2	717	2,271
RIVERSIDE, CITY OF	34	14,513	65,081
WESTON, CITY OF	1	280	378
RICHMOND, CITY OF	7	1,697	7,756

**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.

<b>Table 3.25: NFIP Loss Statistics as of 9/30/2018 by Jurisdiction</b>					
<b>Community</b>	<b>Total Losses</b>	<b>Closed Losses</b>	<b>Open Losses</b>	<b>CWOP Losses</b>	<b>Total Payments</b>
CASS COUNTY	76	60	0	16	938,013.01
CLAY COUNTY	46	41	0	5	723,954.62
JACKSON COUNTY	42	35	0	7	367,738.00
PLATTE COUNTY	218	192	0	26	5,809,669.29
RAY COUNTY	49	42	0	7	659,427.76
LEE'S SUMMIT, CITY OF	79	63	0	16	849,467.78
BELTON, CITY OF	14	12	0	2	63,896.30
HARRISONVILLE, CITY OF	12	9	0	3	270,616.44
LAKE ANNETTE, CITY OF	3	*	*	*	*
LAKE WINNEBAGO, CITY OF	10	7	0	3	241,913.95
PECULIAR, CITY OF	33	28	0	5	390,557.47
PLEASANT HILL, CITY OF	62	54	0	8	352,940.94
RAYMORE, CITY OF	9	7	0	2	63,505.26
EXCELSIOR SPRINGS, CITY OF	98	81	0	17	1,406,477.31
GLADSTONE, CITY OF	54	40	0	14	284,504.83
INDEPENDENCE, CITY OF	344	285	0	59	2,312,933.34
KANSAS CITY, CITY OF	1384	1102	1	281	33,401,674.12
KEARNEY, CITY OF	1	0	0	1	0
LAWSON, CITY OF	1	1	0	0	452.73
LIBERTY, CITY OF	15	12	0	3	349,945.28
MOSBY, CITY OF	62	51	0	11	767,966.75
NORTH KANSAS CITY, CITY OF	11	6	0	5	82,264.82
SMITHVILLE, CITY OF	94	89	0	5	609,376.83
BLUE SPRINGS, CITY OF	13	12	0	1	44,745.14
GRAIN VALLEY, CITY OF	3	2	0	1	8,973.06
GRANDVIEW, CITY OF	32	24	0	8	166,870.45
GREENWOOD, CITY OF	1	1	0	0	55,303.51
OAK GROVE, CITY OF	10	7	0	3	5,116.06
RAYTOWN, CITY OF	119	94	0	25	561,863.62
DEARBORN, CITY OF	2	2	0	0	7,427.44
EDGERTON, CITY OF	17	14	0	3	78,250.08
FARLEY, VILLAGE OF	*	*	*	*	*
FERRELVIEW, VILLAGE OF	*	*	*	*	*
HOUSTON LAKE, CITY OF	*	*	*	*	*
LAKE WAUKOMIS, CITY OF	1	1	0	0	320
NORTHMOOR, CITY OF	1	1	0	0	80,143.13
PARKVILLE, CITY OF	18	12	0	6	146,500.76
PLATTE CITY, CITY OF	14	13	0	1	107,952.06
RIVERSIDE, CITY OF	81	68	0	13	7,372,561.33
TRACY, CITY OF	9	6	0	3	40,032.91
WESTON, CITY OF	11	8	0	3	105,662.86
RICHMOND, CITY OF	3	2	0	1	31,197.29
<b>TOTAL</b>	<b>2991</b>	<b>2439</b>	<b>2</b>	<b>550</b>	<b>54,943,965.79</b>

CWOP = Closed Without Payment

\*Source: Online FEMA no longer available

### 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.

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.

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.

<b>Jurisdiction</b>	<b>Floodplain Ordinance Adopted</b>	<b>NFIP Entry Date</b>	<b>FIRMS Format</b>	<b>Floodplain Regulations</b>	<b>Permitting Process</b>
<b>Cass County</b>	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.
<b>Clay County</b>	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 improved 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			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.
<b>Jackson County</b>	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.

<b>Jurisdiction</b>	<b>Floodplain Ordinance Adopted</b>	<b>NFIP Entry Date</b>	<b>FIRMS Format</b>	<b>Floodplain Regulations</b>	<b>Permitting Process</b>
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	Meets	Permit obtained through the ordinance requirements
<b>Platte County</b>	X	1982	Paper	Exceeds	FIRMS will be adopted by April 2015 and digital available afterwards.
Dearborn	X	9/19/75	Paper	Meets	
Farley	X	December 2014	Paper	Meets	Permits can only be obtained following the ordinance requirements.
Ferrelview	X	2010	Digital	Meets	
Houston Lake	X	2014	Paper	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	Under Review				



<b>Table 3.28: NFIP Regulatory Overview by Jurisdiction (Continued)</b>					
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.
<b>Ray County</b>	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 have effective programs with regards to staffing levels.

**Table 3. 29: Status of Staffing Resources for Effective NFIP Administration**

Jurisdiction	Dedicated Staff	Auxiliary Function	Permit Review	GIS	Education Outreach	Inspections	Enforcement	Engineering
<b>Cass County</b>	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	Full 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
<b>Clay County</b>	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
Mosby	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
<b>Jackson County</b>	Full time		E	E	E	E	E	E
Blue Springs	Full time	X	E	E	E	E	E	E
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
<b>Platte County</b>	Full time	X	E	E/NI	E	E	E	E
Dearborn	Part time							
Farley	Part time	X	NI			NI	NI	
Ferrelview	Part time		E	E	E	E	E	E
Houston Lake	Part time		E	E	E	E	E	E
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								
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
<b>Ray County</b>	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**

Four 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 3.30** for details on current activities.

<b>Table 3.30: Status of Participating Jurisdictions in the CRS Program</b>				
<b>CRS ACTIVITIES</b>	<b>Independence</b>	<b>Kansas City, Mo.</b>	<b>Platte County</b>	<b>Blue Springs</b>
	<i>Class 7</i>	<i>Class 7</i>	<i>Class 5</i>	<i>Class 5</i>
<b>300 Public Information Activities</b>				
Elevation Certificates	X	X	X	X
<i>Status</i>			<i>Scheduled</i>	
Map Information Service	X	X	X	
<i>Status</i>	<i>Scheduled</i>	<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Outreach Projects	X	X	X	X
<i>Status</i>	<i>Scheduled</i>	<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Hazard Disclosure			X	
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Flood Protection Info	X	X	X	
<i>Status</i>	<i>Scheduled</i>		<i>Scheduled</i>	
Flood Protection Asst.			X	
<i>Status</i>			<i>Scheduled</i>	
Flood Insurance Promo		X	X	
<i>Status</i>		<i>Improved</i>	<i>Scheduled</i>	
<b>400 Mapping &amp; Regulations</b>				
Floodplain Mapping	X	X	X	X
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Open Space Preservation	X	X	X	
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Higher Regulatory Standards	X	X	X	X
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Flood Data Maintenance	X		X	X
<i>Status</i>			<i>Scheduled</i>	
Stormwater Management	X		X	
<i>Status</i>			<i>Scheduled</i>	
<b>500 Flood Damage Reduction Activities</b>				
Floodplain Management Planning	X	X	X	
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Acquisition and Relocation	X	X	X	
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Flood Protection	X	X	X	
<i>Status</i>		<i>Improved/Scheduled</i>	<i>Scheduled</i>	
Drainage System Maintenance	X			
<i>Status</i>	<i>Scheduled</i>			
<b>600 Warning and Response</b>				
Flood Warning and Response			X	
<i>Status</i>	<i>Scheduled</i>	<i>Scheduled</i>	<i>Scheduled</i>	
Levees			X	
<i>Status</i>	<i>Scheduled</i>		<i>Scheduled</i>	
Dams				
<i>Status</i>	<i>Scheduled</i>			
<b>Does the HMP effort satisfy CRS requirements?</b>			<b>Yes</b>	

X = Included

**3.3.7 School Profile Survey Findings**

<b>Table 3. 31: School Plans and Policies Inventory</b>					
<b>1. EVACUATION</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
Archie R-V School District	Yes		Yes	Yes	
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District	Yes			Yes	
Lawson School District	Yes	Yes	Yes		
North Kansas City School District	Yes	Yes	Yes	Yes	
Smithville R-II School District	Yes				
Blue Springs School District	Yes			Yes	
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes	Yes	Fire, tornado drills
Independence School District	Yes				
Kansas City School District	Yes	Yes	Yes	Yes	
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes				
Metropolitan Community College	Yes		Yes	Yes	
North Platte R-1 School District	Yes			Yes	
Park Hill School District	Yes	Yes	Yes	Yes	All buildings have evacuation plan (annual review)
Park University	Yes		Yes		
Platte County R-3 School District	Yes	Yes	Yes	Yes	
West Platte R-II School District	Yes			Yes	Yearly practices as part of plan and policies.

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>2. STORM SHELTER</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
Archie R-V School District	Yes		Yes	Yes	
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District	Yes	Yes	Yes	Yes	Applied for mitigation funds to build safe room
Lawson School District	Yes	Yes	Yes		
North Kansas City School District	Yes	Yes	Yes	Yes	Reassess sheltering locations with first responders
Smithville R-II School District	Yes				
Blue Springs School District	Yes	Yes	Yes	Yes	
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes	Yes	
Independence School District	Yes				
Kansas City School District	Yes	Yes	Yes	Yes	Tornado and Earthquake drills executed regularly
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes				
Metropolitan Community College	Yes		Yes	Yes	Have constructed storm shelter on every campus
North Platte R-1 School District	Yes		Yes	Yes	
Park Hill School District	Yes				
Park University	Yes		Yes		
Platte County R-3 School District					
West Platte R-II School District	Yes	Yes	Yes	Yes	Built Storm Shelter as part of new gym project.

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>3. SHELTER-IN-PLACE</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
Archie R-V School District	Yes		Yes	Yes	
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District	Yes			Yes	
Lawson School District	Yes				
North Kansas City School District	Yes		Yes	Yes	
Smithville R-II School District	Yes				
Blue Springs School District	Yes				
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes	Yes	Yes	Yes	
Independence School District	Yes				
Kansas City School District	Yes	Yes	Yes	Yes	
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes				
Metropolitan Community College	Yes		Yes	Yes	
North Platte R-1 School District					
Park Hill School District	Yes	Yes	Yes	Yes	Improve radio communication
Park University	Yes		Yes		
Platte County R-3 School District	Yes	Yes	Yes	Yes	
West Platte R-II School District	Yes			Yes	Yearly practices as part of plan and policies

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>4. INFECTIOUS DISEASE</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
Archie R-V School District				Yes	Professional Development Trainings
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
Excelsior Springs School District	Yes			Yes	
Lawson School District					
North Kansas City School District	Yes	Yes	Yes	Yes	Coordinate with Health Departments
Smithville R-II School District	Yes				
Blue Springs School District					
Fort Osage R1 School District	Yes	Yes	Yes	Yes	
Grain Valley School District	Yes				COVID plan
Independence School District	Yes				
Kansas City School District	Yes	Yes	Yes	Yes	Procedures are in place using county resources
Lee's Summit School District	Yes	Yes	Yes		
Oak Grove R-VI School District					
Metropolitan Community College					
North Platte R-1 School District	Yes		Yes	Yes	
Park Hill School District	Yes				
Park University					
Platte County R-3 School District					
West Platte R-II School District					

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>5. WATER CONSERVATION MEASURES</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
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					
Lawson School District					
North Kansas City School District					
Smithville R-II School District	Yes				
Blue Springs School District					
Fort Osage R1 School District					
Grain Valley School District					
Independence School District					
Kansas City School District	Yes	Yes			
Lee's Summit School District					
Oak Grove R-VI School District					
Metropolitan Community College					
Orrick School District					
North Platte R-1 School District					
Park Hill School District	Yes				
Park University					
Platte County R-3 School District					
West Platte R-II School District					



<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>6. SECURITY PLAN (Intruder, Lockdown)</b>					
<b>School Entity</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
Archie R-V School District	Yes		Yes	Yes	
Harrisonville School District	Yes		Yes	Yes	
Pleasant Hill R-III School District	Yes			Yes	
Raymore-Peculiar School District	Yes	Yes	Yes	Yes	
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				
Blue Springs School District	Yes				
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				
Kansas City School District	Yes	Yes	Yes	Yes	
Lee's Summit School District	Yes	Yes	Yes	Yes	
Oak Grove R-VI School District	Yes				
Metropolitan Community College	Yes		Yes		Installed intrusion detection systems
North Platte R-1 School District	Yes		Yes	Yes	
Park Hill School District	Yes	Yes	Yes	Yes	
Park University	Yes				
Platte County R-3 School District	Yes	Yes	Yes	Yes	
West Platte R-II School District	Yes			Yes	Yearly practices as part of plan and policies

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>						
<b>7. OTHER PLANS</b>						
<b>School Entity</b>	<b>Plan Type</b>	<b>Plan Adopted</b>	<b>Includes Projects Identified for Mitigation Strategy</b>	<b>Used to Implement Mitigation Actions</b>	<b>Reviewed for HMP Update</b>	<b>Measures incorporated into HMP, if applicable</b>
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	Bids out for Visitor Management System for 2015
Park Hill School District	Active Shooter Training and Crisis Plan	Yes	Yes	Yes	Yes	Security camera and communication
Metropolitan Community College	Local EOP	Yes	Yes	Yes	Yes	Specifies action for tornadoes to direct staff, students and others to safe rooms. Hold drills on regular basis to help with training. Inclement weather policy was updated in Nov 2019 with phone call to relevant parties to make decisions regarding campus closings. Priority transportation routes have been identified by facilities department.

<b>Table 3.31: School Plans and Policies Inventory (Continued)</b>					
<b>School Entity</b>	<b>8. Updated Building Codes</b>	<b>9. Provisions to Elevate Construction</b>	<b>10. Strengthen Construction</b>	<b>11. Safe Room Requirements</b>	<b>Profile Survey Completed</b>
Archie R-V School District	Yes	Yes	Yes	Yes	Yes
Harrisonville School District					Yes
Pleasant Hill R-III School District					Yes
Raymore-Peculiar School District					Yes
Excelsior Springs School District	Yes	Yes	Yes	Yes	Yes
Lawson School District					Yes
North Kansas City School District					Yes
Smithville R-II School District	Yes	Yes	Yes	Yes	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	Yes	Yes	Yes
Kansas City School District					Yes
Lee's Summit School District					Yes
Oak Grove R-VI School District					Yes
Metropolitan Community College	Yes	Yes	Yes	One constructed on each campus	Yes
North Platte R-1 School District	Yes			Yes	Yes
Park Hill School District	Yes	Yes			Yes
Park University	Yes				Yes
Platte County R-3 School District	Yes				Yes
West Platte R-II School District	Yes	Yes	Yes	Yes	Yes

**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 (date); Federal \$1,626,664 Non-federal \$542,222  
(Belton School District applied for a grant in 2011, but was not awarded a Safe Room grant)

**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

**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

Safe room project applications for Park Hill and West Platte School Districts were not awarded.

**RAY COUNTY**Richmond R-XVI School District

Safe Room – Awarded 6/11/2013; Federal \$587,322 Non-federal \$195,774

Lawson R-XIV School District

Safe Room application – Pending

### 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. These capabilities were detailed in the 2010 Plan update and remain available for reference. Where there have been changes in the last five years they have been noted below.

#### Warning Systems

The planning area still utilizes a variety of warning systems discussed in the 2015 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. A number of communities use NIXLE. 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 2010 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
- 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 (RPIO)
- Regional Homeland Security Coordinating Committee
- MEMC Integrated Warning Team
- Regional 9-1-1 System
- SAVE Coalition
- Kansas City Organizations Active in Disaster
- Community Emergency Response Teams
- Medical Reserve Corps of Greater Kansas City
- Community Disaster Resiliency Network

*Climate Action Coalition* formed by local elected officials in 2018 has held several 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, and work is underway in early 2020 to complete a greenhouse gas inventory and reduction plan for the region.

*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 ready 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 the clients they serve 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.

The Storm Shelter Model Ordinance included in the 2010 Plan update has not been pursued due to limited resources and other priorities. Although the ordinance has been removed from this plan update, the reference still exists for future consideration.

### **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](http://www.preparemetrokc.org) and on other promotion regarding preparedness for natural hazards.

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

## Section 4: Hazard Identification and Risk Assessment

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## Section 4: Hazard Identification and Risk Assessment

**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 2015 Plan

For the 2020 Plan Update, the Planning Team focused on five natural hazards in the region, a decrease from the 18 previous hazards in the 2015 Plan. 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, after seeking input from stakeholders at the April 2, 2019, plan kickoff meeting.

The statistical risk assessment, used to show maximum and minimum loss estimates, has been removed from all hazard profiles due to complicated calculations and its inability to assist in mitigation planning efforts. Due to this change, the hazard profile sections have been reformatted from the 2015 Plan.

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 in **Appendix C: Maps and References**.

Several data deficiencies noted in the 2015 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. From 2002-2015, 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 2020 Plan Community Profile Survey, each jurisdiction was asked to re-assess its risks for the natural hazards identified in the Plan. "Cascading hazards," those hazards resulting from a natural disaster, were listed to be taken into account when re-assessing 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.

<b>Natural Disaster</b>	<b>Power and Communications Interruption</b>	<b>Water Supply Interruption</b>	<b>Business Interruption</b>	<b>Computer Failure and/or Loss of Records</b>	<b>Transportation Interruption</b>	<b>Health and/or Environmental Hazards</b>
<b>Tornadoes</b>	X	X	X	X	X	X
<b>Severe Thunderstorms</b>	X		X	X		
<b>Severe Winter Weather</b>	X	X	X	X	X	X
<b>Drought</b>		X	X			X
<b>Heat Waves</b>		X	X			X
<b>Floods</b>	X	X	X	X	X	X
<b>Levee Failures</b>	X	X	X	X	X	X
<b>Dam Failures</b>	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.”<sup>i</sup> Different from the 2015 Plan, to determine overall risk, communities were asked to consider two factors as part of the hazard prioritization process: the extent of historical occurrences and the locations of critical facilities in their area.

No jurisdiction identified one or more of the five priority natural hazards as not applicable to their jurisdiction.

### 4.3 Hazard Identification

**Requirement** *[The risk assessment shall include a] description of the type, location, and extent of all §201.6(c)(2)(i): 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, 38 tornadoes have struck Cass County over the past 69 years. However, in the 69 years there were only 22 years experiencing one or more tornado events. Thus, Cass County has a 32 percent chance of having a tornado event in any given year (22 divided by 69 times 100). **Table 4.2** shows the layout of the hazard summary tables.

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 (1950-2018)	>50%	Damages: \$31.45M Deaths: 3 Injuries: 26	38	22	69	32%

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.

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 (1950-2018)	>50% <sup>1</sup>	Damages: \$31.45M Deaths: 3 Injuries: 26	38	22	69	32%
Severe Thunderstorms (including lightning and hail events) (1955-2019)	10%-25%	Damages: \$4.36M Deaths: 1 Injuries: 7	437	58	65	89%
Severe Winter Weather (1996-2019)	>50%	Damages: \$7.3M <sup>2</sup> Deaths: 0 Injuries: 0	54	18	24	77%
Heat Wave* (1998-2019)	>50%	Deaths: 2 Injuries: 0	15	7	22	32%
Drought (2000-2019)	>50%	Total Reports: 118 <sup>3</sup> Total Impacts: 36 <sup>3</sup>	13	4	20	20%
Flooding (1996-2019)	25%-50%	Damages: \$728K Deaths: 0 Injuries: 0	54	21	24	88%
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

<sup>1</sup> 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.

<sup>2</sup> Damage estimates aggregated for all counties affected by winter storms.

<sup>3</sup> Report and Impact data covers 2009-2019 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 (1950-2018)	>50% <sup>1</sup>	Damages: \$114.21M Deaths: 0 Injuries: 30	32	22	69	32%
Severe Thunderstorms (including lightning and hail events) (1955-2019)	10%-25%	Damages: \$7.28M Deaths: 0 Injuries: 3	536	61	65	94%
Severe Winter Weather (1996-2019)	>50%	Damages: \$272K <sup>2</sup> Deaths: 0 Injuries: 0	42	20	24	83%
Heat Wave* (1998-2019)	>50%	Deaths: 2 Injuries: 0	18	7	22	32%
Drought (2000-2019)	>50%	Total Reports: 108 <sup>3</sup> Total Impacts: 32 <sup>3</sup>	14	4	20	20%
Flooding (1996-2019)	25%-50%	Damages: \$4.82M Deaths: 0 Injuries: 0	120	20	24	83%
Levee Failures	10%-15%					
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

<sup>1</sup> 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.

<sup>2</sup> Damage estimates aggregated for all counties affected by winter storms.

<sup>3</sup> Report and Impact data covers 2009-2019 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.

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 (1950-2018)	>50% <sup>1</sup>	Damages: \$11.58M Deaths: 37 Injuries: 193	40	21	69	30%
Severe Thunderstorms (including lightning and hail events) (1955- 2019)	10%-25%	Damages: \$28.85M Deaths: 1 Injuries: 13	392	63	65	97%
Severe Winter Weather (1996-2019)	>50%	Damages: \$17.01M <sup>2</sup> Deaths: 2 Injuries: 0	68	20	24	83%
Heat Wave* (1998-2019)	>50%	Deaths: 48 Injuries: 0	28	12	22	55%
Drought (2000-2019)	>50%	Total Reports: 113 <sup>3</sup> Total Impacts: 70 <sup>3</sup>	13	4	20	20%
Flooding (1996-2019)	25%-50%	Damages: \$22.68M Deaths: 1 Injuries: 0	192	23	24	96%
Levee Failures	10%-15%					
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

<sup>1</sup> 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.

<sup>2</sup> Damage estimates aggregated for all counties affected by winter storms.

<sup>3</sup> Report and Impact data covers 2009-2019 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 (1950-2018)	>50% <sup>1</sup>	Damages: \$35.61M Deaths: 0 Injuries: 17	18	10	69	14%
Severe Thunderstorms (including lightning and hail events) (1955-2019)	10%-25%	Damages: \$2.03M Deaths: 0 Injuries: 1	366	54	65	83%
Severe Winter Weather (1996-2019)	>50%	Damages: \$5.272M <sup>2</sup> Deaths: 0 Injuries: 0	57	22	24	94%
Heat Wave (1998-2019)	>50%	Deaths: 1 Injuries: 0	19	7	22	32%
Drought (2000-2019)	>50%	Total Reports: 143 <sup>3</sup> Total Impacts: 40 <sup>3</sup>	14	4	20	20%
Flooding (1996-2019)	25%-50%	Damages: \$45.4M Deaths: 0 Injuries: 0	106	18	24	75%
Levee Failures	10%-15%					
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

<sup>1</sup> 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.

<sup>2</sup> Damage estimates aggregated for all counties affected by winter storms.

<sup>3</sup> Report and Impact data covers 2009-2019 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.

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 (1950-2018)	>50% <sup>1</sup>	Damages: \$6.45M Deaths: 2 Injuries: 21	32	22	69	32%
Severe Thunderstorms (including lightning and hail events) (1955-2019)	10%-25%	Damages: \$1M Deaths: 0 Injuries: 0	154	45	65	69%
Severe Winter Weather (1996-2019)	>50%	Damages: \$300K <sup>2</sup> Deaths: 0 Injuries: 0	42	17	24	73%
Heat Wave* (1998-2019)	>50%	Deaths: 0 Injuries: 0	12	6	22	27%
Drought (2000-2019)	>50%	**Total Reports: 100 <sup>3</sup> Total Impacts: 27 <sup>3</sup>	13	4	20	20%
Flooding (1996-2019)	25%-50%	Damages: \$101K Deaths: 1 Injuries: 0	53	15	24	63%
Levee Failures	10%-15%					
Dam Failures (No known events on record)	<10%	Damage Likely	0	0	0	Unknown

<sup>1</sup> 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.

<sup>2</sup> Damage estimates aggregated for all counties affected by winter storms.

<sup>3</sup> Report and Impact data covers 2009-2019 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.

**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 24 years equals a 225 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 24 years on record had flood events, thus there is an 88 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

As mentioned before, the 2015 statistical risk assessment was not updated and included in this Plan due to its complicated methodology and its inability to yield values beneficial in planning. To describe vulnerability, this Plan outlines vulnerable populations and structures, as well as the locations of these vulnerabilities.

"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 policy-makers, 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

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<sup>i</sup> FEMA *Local Mitigation Planning Handbook*, 6-B, March 2013

The background of the page is a photograph of a stormy sky. The top half is a dark, greyish-blue sky with some lighter, wispy clouds. The bottom half shows a field of tall, golden-brown grass in the foreground, with a line of green trees in the middle ground. The overall mood is ominous and dramatic.

# 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



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## 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.”<sup>i</sup> 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.<sup>ii</sup>

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.<sup>iii</sup>

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.<sup>iv</sup> 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.”<sup>v</sup> **(See Table 4.6.1)**

**Table 4.6.1 Enhanced Fujita Scale** below compares the F-scale to the EF-scale:

<b>Table 4.6.1: Enhanced Fujita Scale</b>			
<b>Derived EF Scale</b>		<b>Operation EF Scale</b>	
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.<sup>vi</sup> 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.<sup>vii</sup> 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.<sup>viii</sup> Damages were estimated at \$40 million. When adjusted for inflation (in 1997 dollars), the damage from this tornado was \$228 million, making it the fourteenth most damaging tornado in United States history.<sup>ix</sup> The current costliest tornado on record, according to NOAA, is the EF5 tornado devastating Joplin, Missouri on May 22, 2011, with estimated \$2.8 billion in damage (2011 dollars).<sup>x</sup>

*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.<sup>xi</sup> 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** on the next page 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 on March 6, 2017 due to an EF3 tornado.

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
<b>Total</b>	<b>38</b>	<b>32</b>	<b>40</b>	<b>18</b>	<b>32</b>	<b>160</b>

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.<sup>xii</sup> 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.

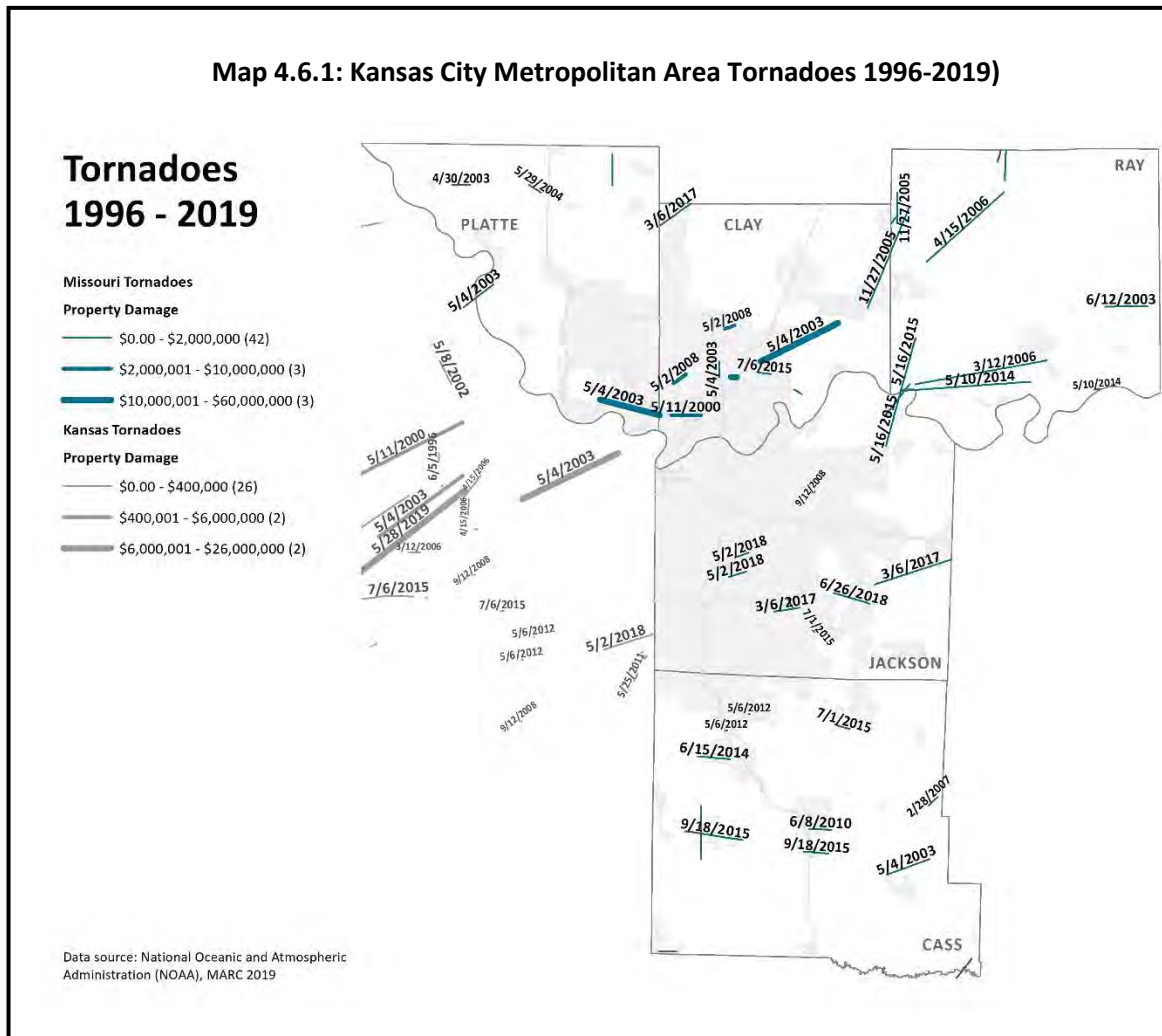
County	Location	Date	Magnitude	Deaths	Injuries	Property Damage*	Crop Damage*
CASS	GOWDY	7/1/2015	EF0	0	0	\$0	\$0
CASS	WEST LINE	9/18/2015	EF1	0	0	\$0	\$0
CASS	HARRISONVILLE ARPT	9/18/2015	EF0	0	0	\$0	\$0
CASS	BELTON	5/2/2018	EF0	0	0	\$0	\$0
CLAY	GLENAIRE	7/6/2015	EF0	0	0	\$0	\$0
CLAY	SMITHVILLE	3/6/2017	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

**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, property damages, loss of life and injuries.

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 this 2020 Plan update to streamline information. The 2020 Plan update focuses 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.



**4.6.1a Tornado Outbreak of May 2019**

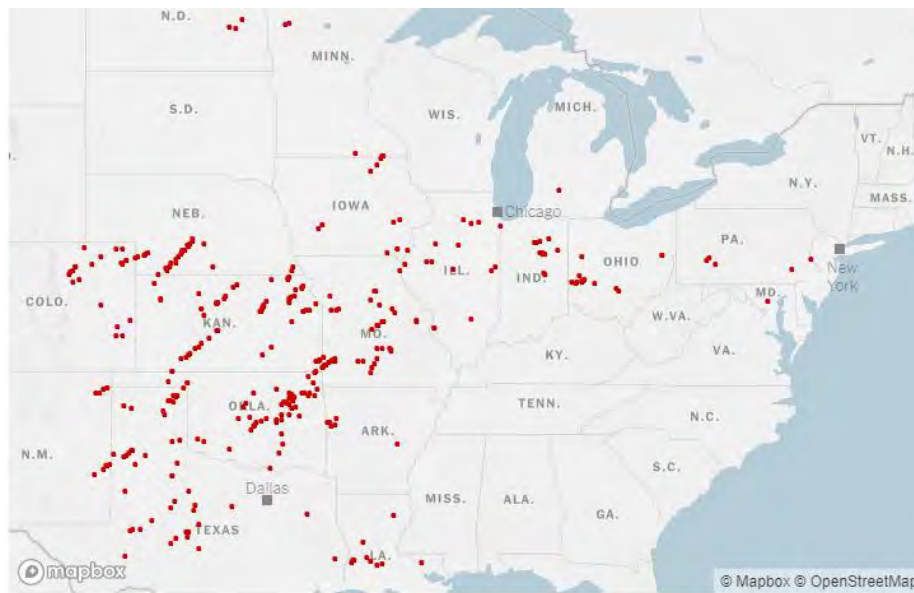
A major tornado outbreak occurred across the central region of the United States during the month of May 2019. Damage was reported in multiple Midwest states as well as states outside the Midwest. As of June 2019, tornado events from 2019 are not logged in the NOAA Storm Events Database. Information



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: National Weather Service - By Jin Wu

Source: Alan Blinder, “After One More Day of Tornadoes, Hope for a Respite,” The New York Times<sup>xiii</sup>

#### 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.

#### Clay County, MO – May 28, 2019 <sup>xiv</sup>

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<sup>xv</sup>**

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.<sup>xvi</sup> 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**

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<sup>xvii</sup>** 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 June 12, 2019. 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.

Magnitude	Years with +1 Events	No.	Deaths	Injuries	Property Damage	Crop Damage
F0	14	20	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
<b>Overall</b>	<b>22</b>	<b>38</b>	<b>3</b>	<b>26</b>	<b>\$31,446,840</b>	<b>\$0</b>

Magnitude	Years with +1 Events	No.	Deaths	Injuries	Property Damage	Crop Damage
F0	6	9	0	0	\$7,780	\$0
F1	10	12	0	0	\$6,325,780	\$0
F2	6	6	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
<b>Overall</b>	<b>22</b>	<b>32</b>	<b>0</b>	<b>30</b>	<b>\$114,208,560</b>	<b>\$0</b>

Magnitude	Years with +1 Events	No.	Deaths	Injuries	Property Damage	Crop Damage
F0	11	17	0	0	\$192,280	\$0
F1	8	10	0	0	\$580,000	\$0
F2	5	7	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
<b>Overall</b>	<b>21</b>	<b>40</b>	<b>37</b>	<b>193</b>	<b>\$11,575,030</b>	<b>\$0</b>

Magnitude	Years with +1 Events	No.	Deaths	Injuries	Property Damage	Crop Damage
F0	3	4	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
<b>Overall</b>		<b>18</b>	<b>0</b>	<b>17</b>	<b>\$35,605,060</b>	<b>\$0</b>

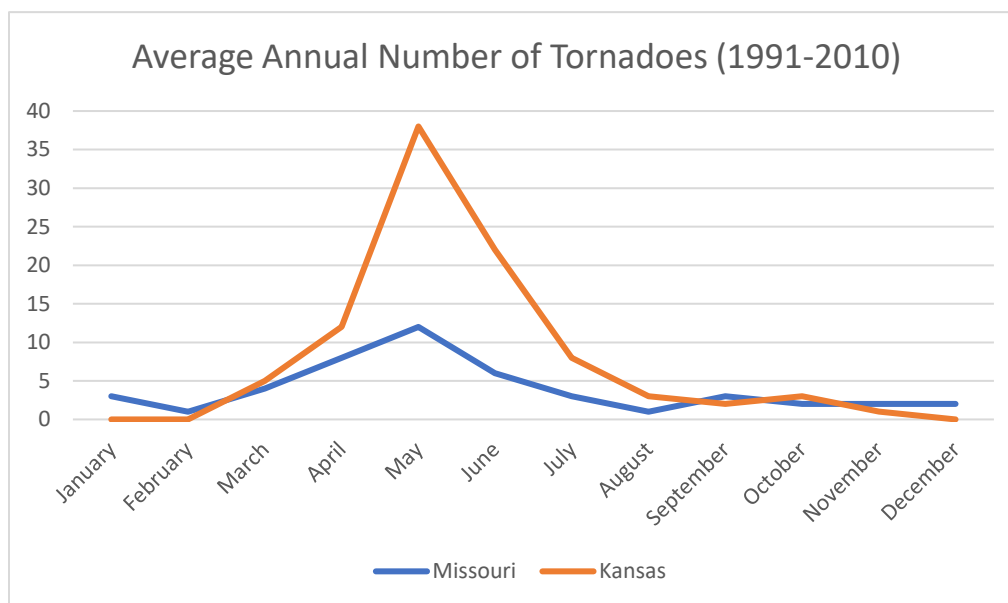
Magnitude	Years with +1 Events	No.	Deaths	Injuries	Property Damage	Crop Damage
F0	8	9	0	0	\$295,000	\$0
F1	11	11	0	0	\$507,750	\$0
F2	6	8	0	2	\$375,000	\$0
F3	1	2	2	18	\$2,750,000	\$0
F4	1	2	0	1	\$2,525,000	\$0
F5	0	0	0	0	\$0	\$0
<b>Overall</b>	<b>22</b>	<b>32</b>	<b>2</b>	<b>21</b>	<b>\$6,452,750</b>	<b>\$0</b>

#### 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 2018, a total of 69 years.

County	Years with 1+ Events	Probability (%)
Cass	22	32%
Clay	22	32%
Jackson	21	31%
Platte	10	14%
Ray	22	32%

The central United States has a repeatable annual tornado cycle, with the highest probability of tornadoes occurring in the spring.<sup>xviii</sup> 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: NOAA U.S. 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.

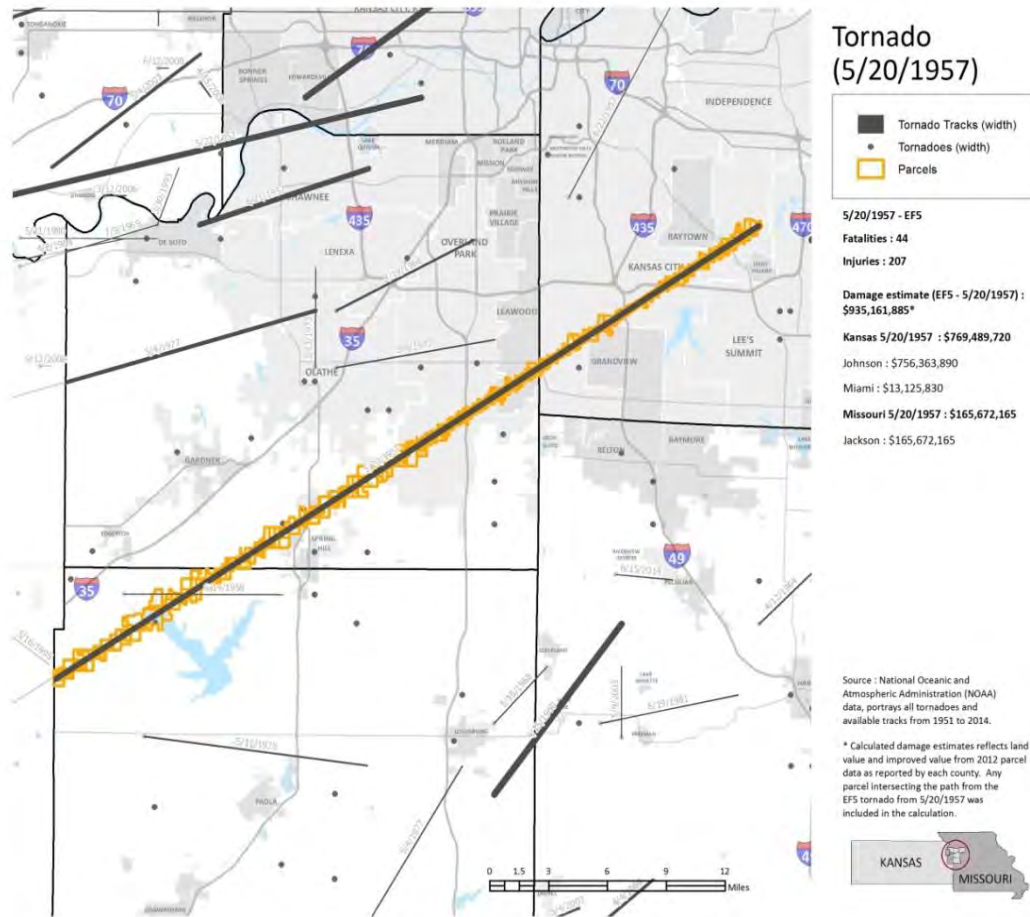
EF-Scale	Speed (mph)	Probable Risk (Highly Likely, Likely, Possible or Unlikely)
0	65-85	60% — Highly Likely
1	86-109	64% — Highly Likely
2	110-137	43% — Likely
3	138-167	24% — Possible
4	168-199	7% — Unlikely
5	200-234	2% — Unlikely

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 69 years, 2% of tornadoes were rated EF5. Although, this percentage is low, an EF5 tornado poses catastrophic risk to people and property.

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** on the following page 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.

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. Alternately, 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.



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

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.

<b>Table 4.6.12: Estimated Categories of Impact</b>				
<b>Effects of Tornadoes</b>	<b>Life</b>	<b>Property</b>	<b>Emotional</b>	<b>Financial</b>
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.<sup>xix</sup> 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.<sup>xx</sup> 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

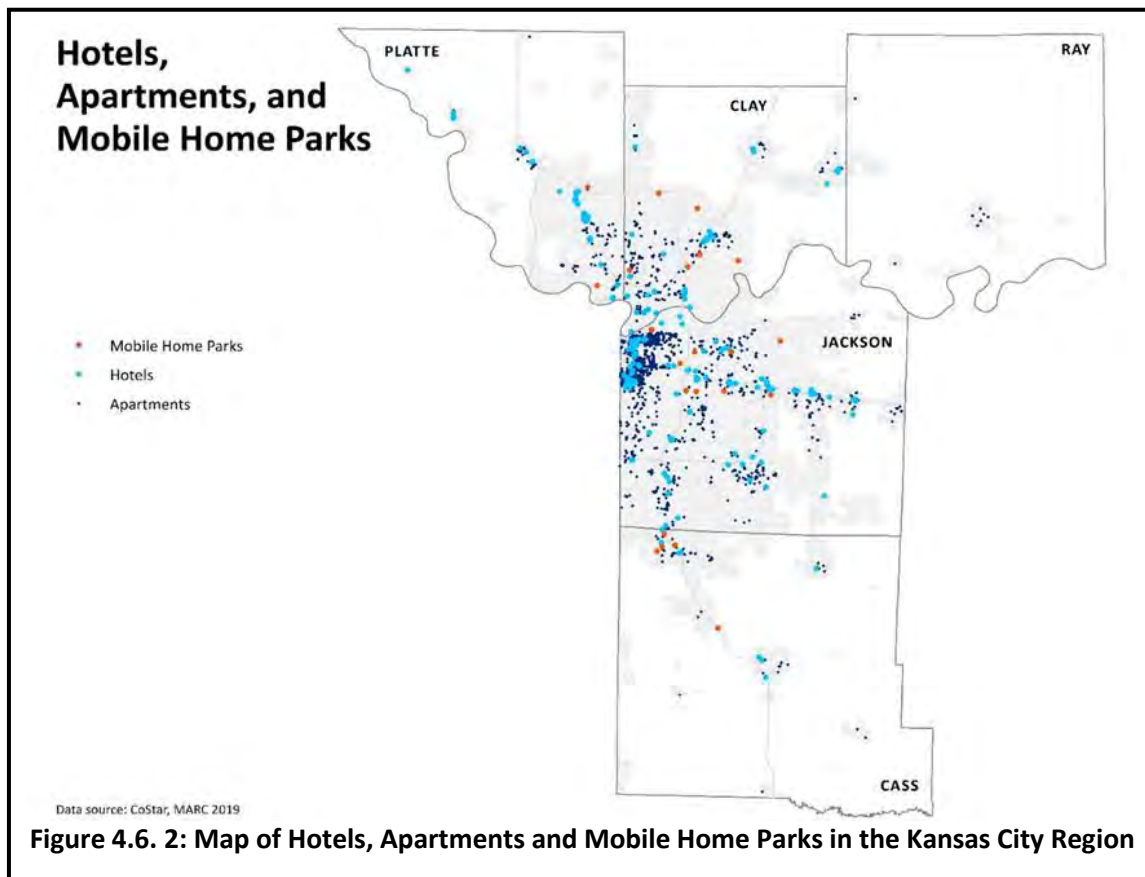
Tornadoes affecting the greater Kansas City metropolitan area have ranged from F0 to F5. The vast majority of tornadoes have been F0 to F1, although several F4 tornadoes and an F5 tornado have affected the Kansas City metropolitan area. Tornadoes of this magnitude are normally only on the ground for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





<b>Asset (critical facility)</b>	<b>Cass</b>	<b>Clay</b>	<b>Jackson</b>	<b>Platte</b>	<b>Ray</b>	<b>Planning Area</b>	<b>Kansas City</b>
Day Care	52	106	414	34	6	<b>612</b>	291
Nursing Home	6	10	49	9	-	<b>74</b>	42
Public Housing Building	0	144	547	29	79	<b>799</b>	583
Multifamily Properties Assisted	5	18	93	4	2	<b>122</b>	85
School	52	88	307	41	12	<b>500</b>	22
Dormitory	0	4	14	3	0	<b>21</b>	15
Shopping Center	87	318	775	0	6	<b>1,186</b>	659
Hotels	8	40	133	39	0	<b>220</b>	136
Apartments	51	197	1,809	103	9	<b>2,169</b>	1,606
Trailer Parks	5	6	10	2	0	<b>23</b>	9
NFL Stadium	0	0	1	0	0	<b>1</b>	1
MLB Stadium	0	0	1	0	0	<b>1</b>	1
Botanical / Zoological Garden	0	0	1	0	0	<b>1</b>	1
Arena	0	0	3	0	0	<b>3</b>	2

#### 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.

<sup>i</sup> SEMA State Hazard Analysis, A-1; NOAA SPC Web site, online data

<sup>ii</sup> SEMA State Hazard Analysis, A-1

<sup>iii</sup> SEMA State Hazard Analysis, A-1

<sup>iv</sup> NOAA Web site, online data

<sup>v</sup> NOAA, NWS, The Enhanced Fujita Scale (EF Scale), <https://www.weather.gov/oun/efscale>

<sup>vi</sup> NOAA

<sup>vii</sup> WDAF TV 4 Web site, online data

- viii WDAF TV 4 Web site, online data
- ix Brooks and Doswell, NOAA NSSL 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](https://www.weather.gov/eax/28May2019_Tornadoes)
- xv NOAA NWS 28 May 2019 Tornadoes [https://www.weather.gov/eax/28May2019\\_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](http://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)

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## 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.<sup>i</sup>

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.<sup>ii</sup> Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms.<sup>iii</sup>

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 outburst 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.<sup>iv</sup>

Thunderstorms associated with tornado development also contribute to the number one killer — flash floods.<sup>v</sup> 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.<sup>vi</sup> 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.<sup>vii</sup> 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 through Table 4.7.3** provide historical summaries of severe thunderstorms for wind, hail and lightning events since January 1, 1950.

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
<b>Total</b>	<b>1,038</b>	<b>1</b>	<b>22</b>	<b>\$16,692,750</b>	<b>\$7,000</b>

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
<b>Total</b>	<b>1,049</b>	<b>0</b>	<b>0</b>	<b>\$25,312,500</b>	<b>\$305,000</b>

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
<b>Total</b>	<b>13</b>	<b>1</b>	<b>1</b>	<b>\$463,000</b>	<b>\$0</b>

Of the 469 thunderstorm, hail, and lightning events that have occurred since January 1, 2014, six are damaging wind events, one is a damaging hail event and two are damaging lightning events. Winds caused roughly \$106,000 in damage, the hail event accounted for \$10,000 in damages, and the two lightning events caused \$51,000 in damage according to the NOAA NCDC web site. On July 5, 2018 one person was killed due to a lightning strike. **Table 4.7.4** and **Table 4.7.5** include 2014 data from the last Plan due to lack of data reported past 2018. The tables list the damaging events from severe thunderstorm winds, hail, and lightning since 2014, a year before the 2015 Plan update.

**Table 4.7.6** lists the aforementioned lightning events plus ten high wind events and one heavy rain event associated with severe thunderstorms since a year before the 2015 Plan.

*Data Limitation:* The NOAA Storm Events Database does not have data for thunderstorms past 2018.

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

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

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

### **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 counties 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 4.7.7 – Table 4.7.11<sup>viii</sup>** summarize all thunderstorm wind events more than 57 mph and the impact on each of the five counties in the planning area. Similarly, **Table 4.7.12 – Table 4.7.16** summarize hail events at least one inch in diameter. Information was retrieved from the NOAA NCDC Storm Event Database as of June 16, 2019.

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

Wind Speed (mph)	Events	Deaths	Injuries	Property Damage \$	Crop Damage \$
57-67	158	0	0	387,000	0
68-81	69	0	2	17,030,000	0
82-100	7	0	0	68,000	0
Total	234	0	2	17,485,000	0

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

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

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 4.7.12: 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 4.7.13: 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 4.7.14: 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 4.7.15: 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

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

Historical statistics associated with the occurrence of severe thunderstorms in the region are presented in Table 4.7.17 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.

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 4.7.18 presents the likely adverse impact of future Kansas City metropolitan area severe thunderstorm and related events.

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 4.7.19, 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.

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

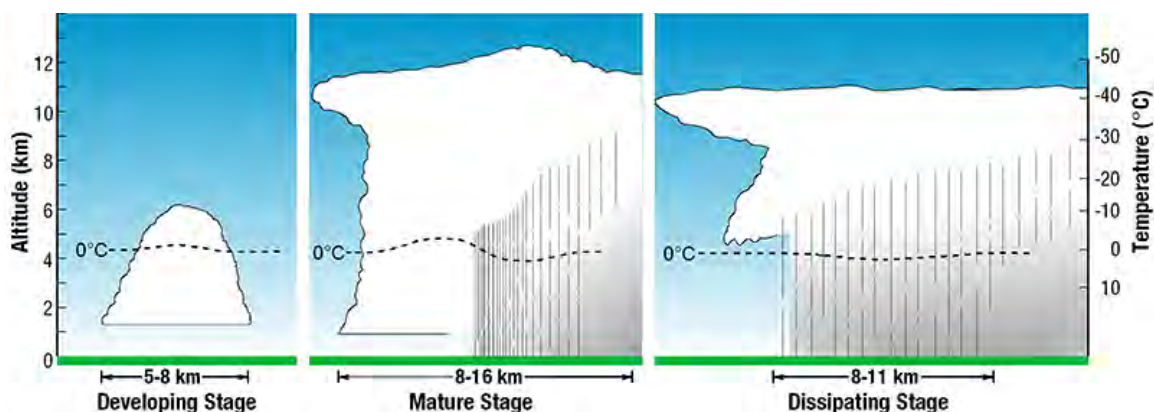
NOAA meteorologists constantly monitor weather patterns, both nationally and locally, and issue watches and warnings as needed.

**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.<sup>ix</sup>

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 a 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.

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<sup>i</sup> NOAA Web Site, <http://www.nssl.noaa.gov/education/svrwz101/thunderstorms/>

<sup>ii</sup> NOAA Storm Events Database

<sup>iii</sup> FEMA Web Site, <https://www.ready.gov/thunderstorms-lightning>

<sup>iv</sup> Missouri State Hazard Analysis, Annex A

<sup>v</sup> Missouri State Hazard Analysis, Annex A

<sup>vi</sup> NWS Preliminary US Flood Fatality Statistics, NOAA, <https://www.weather.gov/arx/usflood>

<sup>vii</sup> NOAA Web Site

<sup>viii</sup> NOAA NCDC Web Site, <https://www.ncdc.noaa.gov/stormevents>

<sup>ix</sup> 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

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## 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.<sup>i</sup> 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.<sup>ii</sup> According to the NWS, significant accumulations of ice are defined as one-quarter inch or more of ice.<sup>iii</sup> 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.<sup>iv</sup> 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.<sup>v</sup> Sleet is raindrops that freeze and form ice pellets before reaching the ground.<sup>vi</sup> Like hail, sleet may “bounce” when it hits the ground or other surface instead of sticking and forming a coating.<sup>vii</sup> Sleet, however, may accumulate like snow.<sup>viii</sup> Sleet is the accumulation of half an inch or more of sleet.<sup>ix</sup>

### 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 early 2019 are described in **Table 4.8.1**.

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. Narratives from events with property damage are stated. Highlights are several events of described 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 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.<sup>x</sup> 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.<sup>xi</sup>

#### **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

<b>County</b>	<b>Date</b>	<b>Event Type</b>	<b>Deaths</b>	<b>Injuries</b>	<b>Property Damage \$</b>	<b>Crop Damage \$</b>
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

County	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$
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

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.

#### 4.8.2 Probable Locations

Magnitude >50%

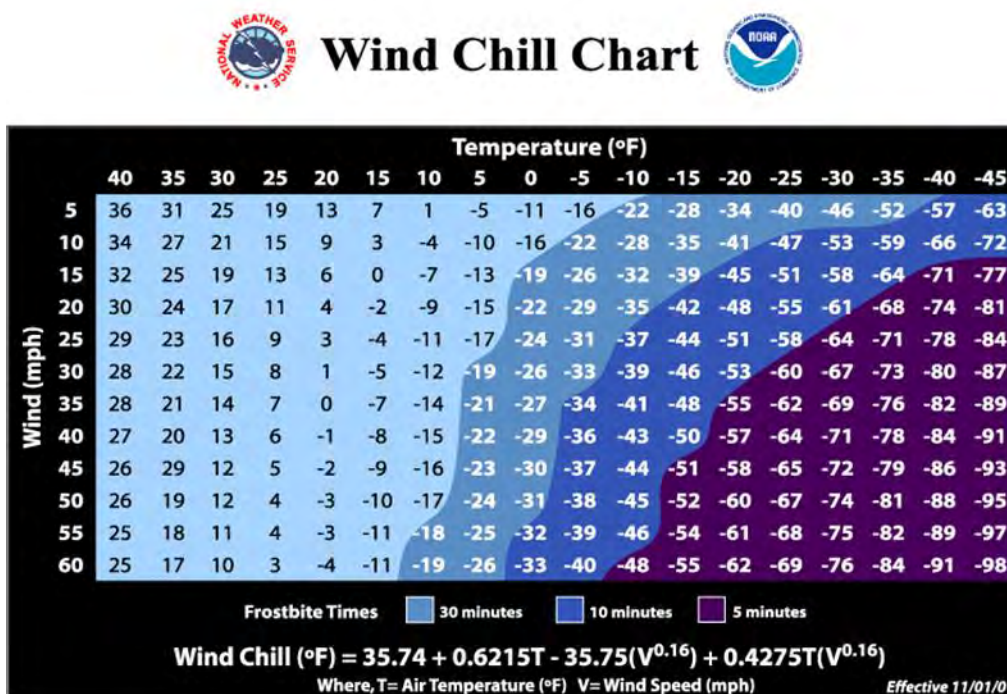
Severe winter weather events tend to be regional in scope. Therefore, the entire Kansas City metro area including Cass, Clay, Jackson, Platte and Ray counties may be affected. Therefore, all counties were given a >50% magnitude rating.

#### 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 4.8.1 Wind Chill Chart.** 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.<sup>xiii</sup>



Source: National Weather Service

Figure 4.8.1: 2001 NWS Wind Chill Index

**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.

**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 chance 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.<sup>xiii</sup> 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.<sup>xiv</sup> The winter of 1978–79 had the lowest average seasonal temperature for the Kansas City metropolitan area: 21.5 degrees.<sup>xv</sup>

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.<sup>xvi</sup> As the wind velocity increases, heat is carried away from the body at an accelerated rate, lowering the body temperature.<sup>xvii</sup> 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):

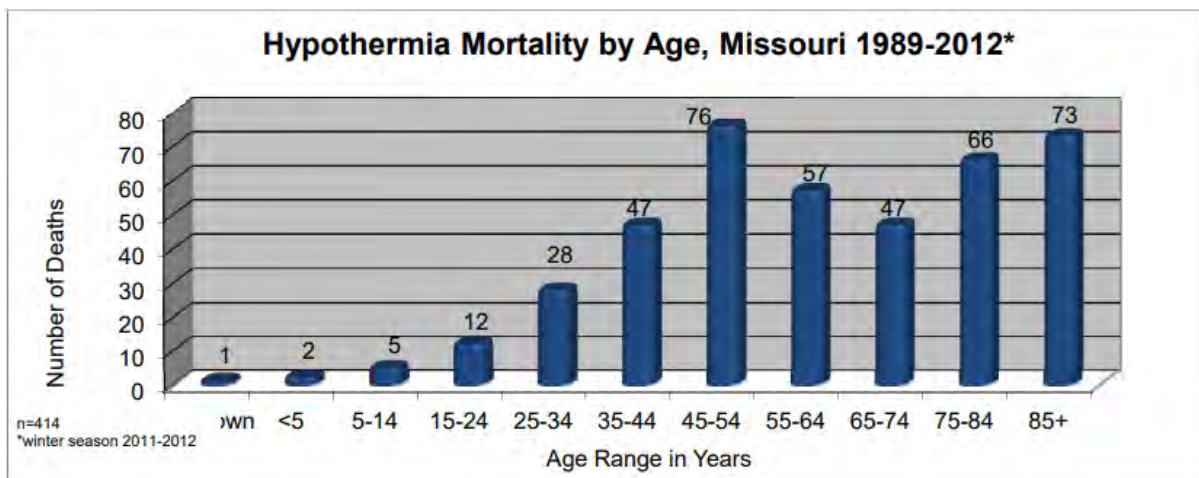
- Minimal (or no) warning  
 6 to 12 hours warning

- 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.<sup>xviii</sup> 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.<sup>xix</sup> 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

**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.

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

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## 4.9 Flooding

With the exception of fires, floods are the most common and widespread of all-natural disasters. Most communities have experienced some type of flooding.<sup>i</sup> Flooding occurs when normally dry areas of land are partially or completely inundated by water.<sup>ii</sup> 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).<sup>iii</sup> 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 Dam 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.<sup>iv</sup> 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.<sup>v</sup> 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.<sup>vi</sup> 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.<sup>vii</sup>

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.<sup>viii</sup> 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.<sup>ix</sup>

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.<sup>x</sup> 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.<sup>xi</sup>

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.<sup>xii</sup> 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.<sup>xiii</sup>

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.<sup>xiv</sup> The Weather Channel states that as climate change increases, the risk of heavy rainfall will increase. Causing the average number of flood deaths to increase.<sup>xv</sup>

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<sup>xvi</sup>:

**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.

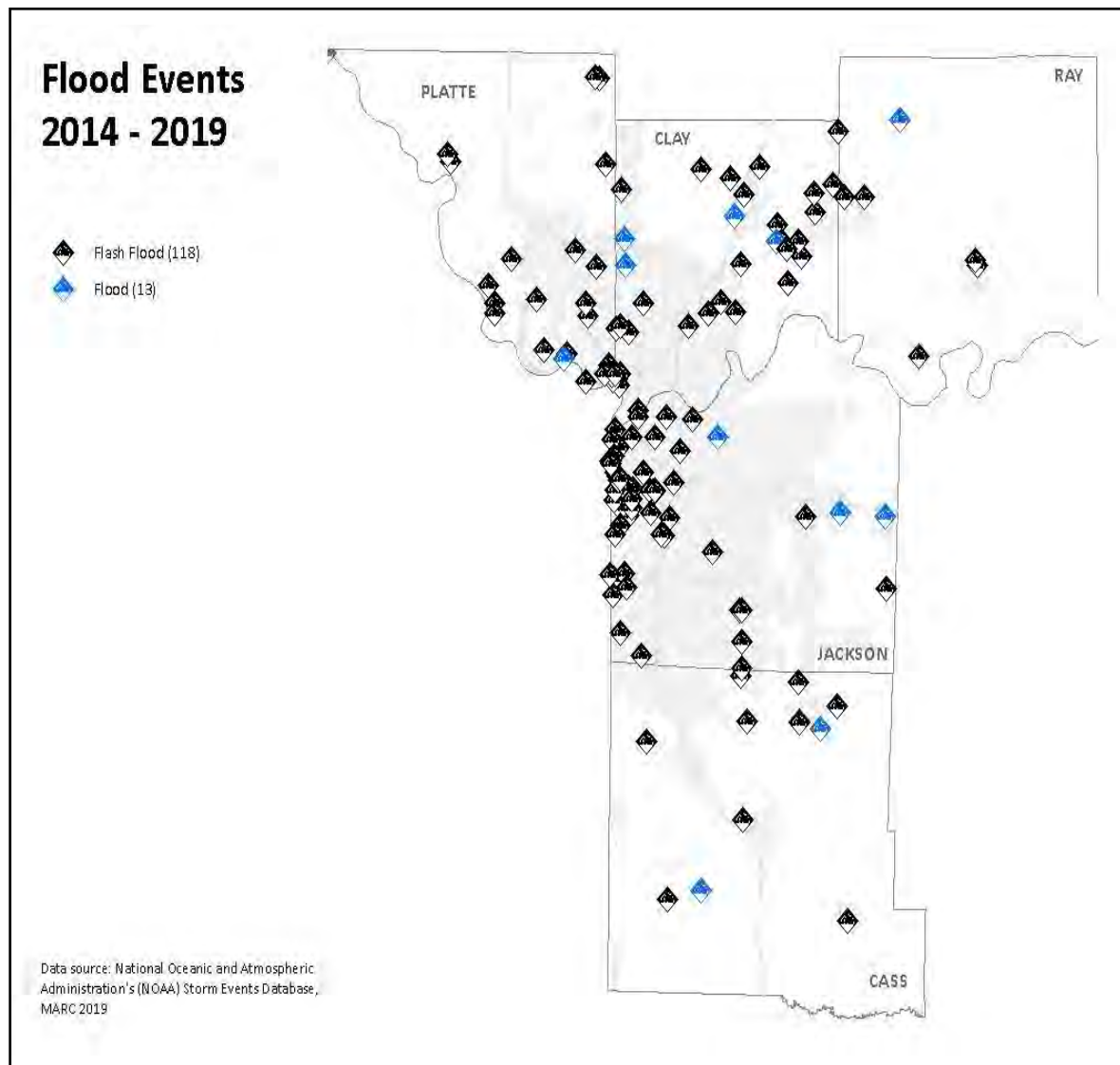
**Flash Flood Statement** – Issued to provide more information on a Flash Flood Watch or Warning, or to cancel all or part of those products.

**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. **Map 4.9.1** and **Table 4.9.1** depict flooding events by county occurring during the last five years.



**Map 4.9.1: Flood Events in the Kansas City Area (2014-March 2019)**

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
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



County	Location	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$	Cause
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
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

County	Location	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$	Cause
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

County	Location	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$	Cause
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- GEBUR	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

County	Location	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$	Cause
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
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

County	Location	Date	Event Type	Deaths	Injuries	Property Damage \$	Crop Damage \$	Cause
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
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 NCDL Web site

### June 21, 2015 – Ray County

On the evening of June 20, an MCS was moving southeastward out of Iowa, into northeastern Missouri. Widespread thunderstorms formed on the southern flank of the original MCS causing widespread thunderstorm wind damage and some large hail up to the size of golf balls. As the boundary slid southward through the day on June 21 storms continued to form, bringing more wind damage and hail, this time up to baseball sized. These storms moved through the KC Metro area, which allowed for several reports of severe weather. On June 22, more storms formed across northern Missouri, bringing wind damage and flooding. The flash flooding was ongoing between Richmond and the Crooked River.

**July 6, 2015 – Jackson County**

A slow moving cold front advanced into an extremely unstable air mass over eastern Kansas and northwestern and west central Missouri. Thunderstorms developed along the front producing extremely heavy rain, with some areas seeing up to 6, flash flooding, damaging winds and a few tornadoes. Southbound I-435 at 23rd street was shut down due to flash flooding. Cars were stalled on the highway in the flood waters.

**July 26, 2017 – Clay County**

On the evening of July 26, a line of thunderstorms formed roughly along the Interstate 70 corridor. The orientation of these storms was such that they trained 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. In this location between 5 to 7 inches of rain fell 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. The restaurant owners tried to salvage their business but had to flee to the roof to escape the rising waters around them. Local news televised a dramatic water rescue of the restaurant owners via motorized raft.<sup>xvii</sup> Additionally, there were two water rescues near US 169 and State Highway 9 near Northmoor.

**October 22, 2017 – Cass County**

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 were recorded, with isolated reports of 8 to nearly 10. 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 Monday into Tuesday morning, due to flooding.<sup>xviii</sup> Several streets in Harrisonville were flooded with 2 to 3 feet of water.

**October 8, 2018 – Clay County**

Starting on October 6th, the atmosphere set itself up in a pattern conducive to bring a prolonged period of heavy rain to portions of northeastern Kansas and northwestern Missouri. The heaviest rain occurred Saturday and Sunday (Oct 6-7). By Tuesday night (October 9th) more than 11 inches of rain fell in and around the Kansas City Metro. Local drought conditions were still in the Extreme to Exceptional category going into the event, so flash flooding was relatively low impact, relegated mostly to several road closures. The bigger impact from this prolonged rainfall event came from local river and stream flooding. Several streams entered the moderate to major flooding category. The 4-day event spanning Oct 6-9 resulted in the greatest 4-day rain total in recorded Kansas City History. At Kansas City International Airport 9.79 inches were recorded for the Oct 6-9 time-period, beating out Sept 12-15, 1977, which had 9.48 over the 4-day span. Several roads around 169 and 69 were flooded.

**March 14<sup>th</sup>, 2019 – Platte County**

Several months of heavy snow across the Northern Plains set the stage for a significant and catastrophic flooding event when temperatures warmed, and heavy rain fell across Nebraska and the Dakotas. While the more significant damage occurred across eastern Nebraska several counties along the Missouri River and Northern and Central Missouri also saw some significant impacts. Numerous locations along the Missouri River received major flooding, in which the impacts were aggravated by several levy failures. These failures resulted in numerous roads across the area being completely washed away and the inundation of several small towns and residential areas. While the flash flooding threats associated with the levy failures were transient, the Missouri River remained in either minor or moderate flood through the rest of the month. As the Missouri River still to near record levels it impacted portions of Platte County. Most notable was the flooding in Parkville, where the river rose to 35.01 feet. This was a record at the time, but the gauge was only in existence for a short time before the flood, so it's unknown how this ranked historically; however, the upstream gauge in Leavenworth, Kansas reached 31.30 feet (2nd place at the time). Portions of Parkville were flooded, as well as English Landing Park. The river remained in flood into the middle part of May. Note: The dollar value assigned to the damages is likely not accurate, as the full extent of the damage is unknown.

**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 9<sup>th</sup> Street, Hardesty, Gardner and Chouteau Trafficways; Southwest Boulevard and surrounding areas; State Line Road and 95<sup>th</sup> Street; Turkey Creek near 31<sup>st</sup> Street; Fairmont; and Westport. Due to flooding happening along rivers and in the floodplain, all counties were given a 35% - 50% magnitude rating.

**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 critical facilities are susceptible to the hazard. Table **4.9.2** below summarizes the number and type of critical facilities for all jurisdictions in the 100-Year Floodplain. Detailed lists of critical facilities and 100-year floodplain areas were included in the 2015 Plan. An online mapping tool developed through the plan update allows jurisdictions to review the 100-year floodplain with other data layers including critical facilities to support their planning work. An example of the online planning tool is included in **Appendix F**.

<b>Table 4.9.2: Critical Facilities in the Kansas City Area within the 100-Year and 500-Year Floodplain</b>			
<b>Jurisdiction</b>	<b>Critical Facilities in 100-Year Floodplain</b>	<b>Critical Facilities in 500-Year Floodplain</b>	<b>Types of Critical Facilities</b>
<b>Cass County</b>	19	19	Dams, hazardous materials facilities, municipal buildings, police station
<b>Clay County</b>	25	108	Airports, child care centers, dams, fire/EMS facilities, hazardous materials facilities, municipal building, police station, schools, college, nursing home
<b>Jackson County</b>	63	146	Hazardous materials facilities, fire/EMS facilities, dams, colleges, child care centers, municipal building, police station
<b>Platte County</b>	14	37	Airports, dams, fire/EMS facilities, hazardous materials facilities, municipal building
<b>Ray County</b>	14	16	Airport, hazardous materials facilities, police station, schools, dams
<b>Kansas City, MO</b>	50	139	Hazardous materials facilities, fire/EMS facilities, dams, college, child care centers, school, police station, airport

#### **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 24 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

In 2018, the state of Missouri (SEMA) updated their 2013 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 2018 Missouri State Hazard Mitigation Plan is excerpted below. Table 4.9.2 and 4.9.3 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<sup>xix</sup>**

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 where obtainable (79 counties and City of St. Louis), draft floodplain data where obtainable (18 counties) and Hazus-generated floodplain data elsewhere (17 counties). 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.

Hazus analysis provides the number of buildings impacted, estimates of building repair costs, and 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 as some individuals 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.

Hazus impact analyses were completed for all counties, and the city of St. Louis, to see which counties ranked the highest on these risk indicators (see Table 3.34 and figures that follow). Using GIS, Hazus flood results were mapped to show flood loss potential and how it varies across the State. The primary indicators used to assess flood losses were:

- **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 3.109 3 Risk Assessment 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 to 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.

SEMA reports that Clay and Jackson counties are among the top 10 counties in the state that could be most severely impacted based on building loss and displaced persons. These high rankings are due in part to the larger population bases in these urban counties and their proximity to the Missouri River.

In the following tables from the SEMA Missouri Hazard Mitigation Plan show the potential for 2,335 residential structures exposed to the 100-year floodplain, the potential for 2,742 structures to be at risk and of those 22 percent or 600 structures have the potential to be substantially damaged, affecting 18,688 persons. Of those persons that could be affected, 9,818 could require emergency shelter. The direct and income loss to the five-county area could total almost \$2.5 billion.

<b>Table 4.9.3: Direct Building Loss and Income Loss (Exposure)</b>					
	<b>Cass</b>	<b>Clay</b>	<b>Jackson</b>	<b>Platte</b>	<b>Ray</b>
Countywide Building Exposure	\$10,922,958,000	\$27,589,080,000	\$89,309,906,000	\$11,360,168,000	\$2,537,055,000
Structural Damage	\$53,489,000	\$165,453,000	\$737,320,000	\$76,465,000	\$34,966,000
Loss Ratio	0.49%	0.60%	0.83%	0.67%	1.38%
Contents Loss	\$38,591,000	\$132,741,000	\$1,044,344,000	\$74,818,000	\$28,228,000
Inventory Loss	\$911,000	\$2,791,000	\$53,377,000	\$2,757,000	\$626,000
Total Direct Loss	\$92,991,000	\$300,985,000	\$1,835,041,000	\$154,040,000	\$63,820,000
Total Income Loss	\$143,000	\$693,000	\$11,241,000	\$610,000	\$180,000
Total Direct and Income Loss	<b>\$93,134,000</b>	<b>\$301,678,000</b>	<b>\$1,846,282,000</b>	<b>\$154,650,000</b>	<b>\$64,000,000</b>
#MSDIS Residential Structures Exposed	162	551	1,123	181	318
# Hazus Buildings Risk	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 3.110-3.117

<b>Table 4.9.4: Direct Building Loss and Income Loss (Structure Type)</b>						
		<b>Cass</b>	<b>Clay</b>	<b>Jackson</b>	<b>Platte</b>	<b>Ray</b>
Residential	# Residential Structures	162	551	1,123	181	318
	Total \$\$ of Loss	\$41,717,032	\$151,045,375	\$297,260,050	\$55,708,197	\$72,134,138
Agriculture	# Agriculture Structures	264	192	218	109	502
	Total \$\$ of Loss	\$71,432,557	\$45,148,845	\$63,320,119	\$27,181,777	\$182,858,327
Commercial	# Commercial Structures	67	143	1,095	82	22
	Total \$\$ of Loss	\$36,534,529	\$151,070,167	\$1,216,751,171	\$71,359,460	\$12,229,749
Education	# Education Structures		1	2		
	Total \$\$ of Loss		\$1,929,165	\$4,444,236		
Government	# Government Structures		14	1	26	4
	Total \$\$ of Loss		\$15,698,048	\$1,429,894	\$30,855,741	\$2,778,727
Industrial	# Industrial Structures	27	65	598	42	11
	Total \$\$ of Loss	\$12,314,472	\$72,450,963	\$711,502,597	\$37,870,378	\$8,777,340
<b>Total # Population Affected</b>		<b>426</b>	<b>1,433</b>	<b>2,740</b>	<b>445</b>	<b>836</b>
<b>Total Loss- Hazus Layer</b>		<b>\$161,998,590</b>	<b>\$437,342,564</b>	<b>\$2,294,708,066</b>	<b>\$222,975,553</b>	<b>\$278,778,282</b>

Source: MO State hazard Mitigation Plan, Flooding, page 3.110-3.117

The direct building loss for the five-county area includes 2,335 residential structures, 1,409 commercial structures, 48 public and educational buildings, and 743 industrial buildings. Total dollars could top almost \$3.4 billion and affect 5,880 persons.

#### 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



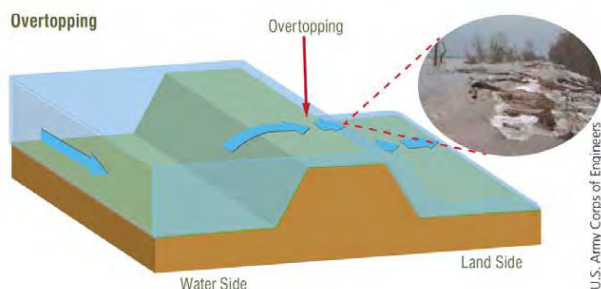
Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant 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.<sup>xx</sup> 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 Map 4.10.1.**



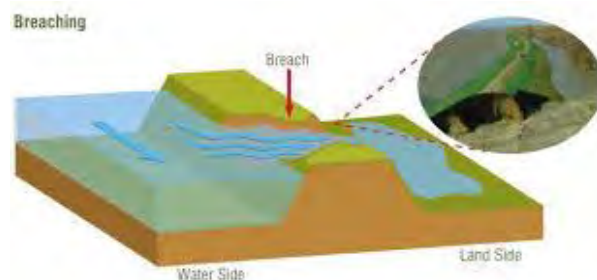
Source: Jackson County, MO Sheriff's Office<sup>xxi</sup>

**Map 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.<sup>xxii</sup> 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 4.10.1 – Figure 4.10.2.**



U.S. Army Corps of Engineers



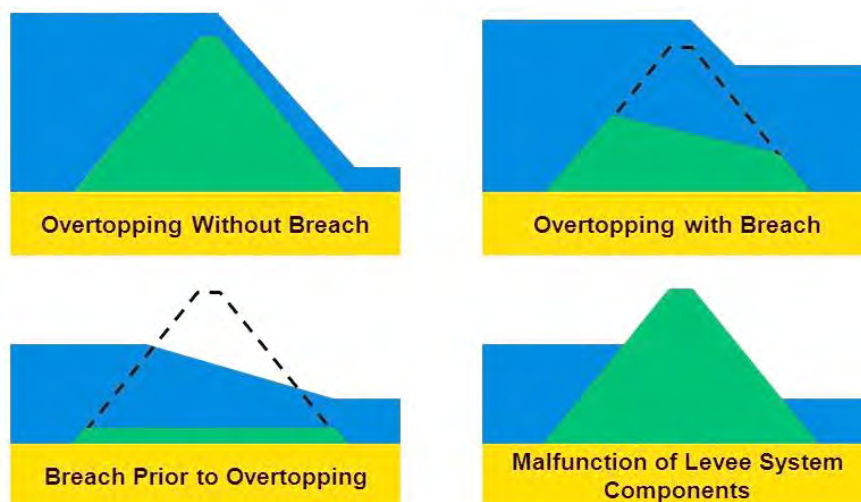
**Figure 4.10. 1: Overtopping of a Levee**

**Figure 4.10. 2: Breaching of a Levee**

Source: Missouri State Hazard Mitigation Plan 2013

Earthen levees can be damaged in several ways. **Figure 4.10.3** 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.



Source: Missouri State Hazard Mitigation Plan 2013

**Figure 4.10. 3: Inundation Scenarios**

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.<sup>xxiii</sup>

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<sup>xxiv</sup>

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



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
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

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
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

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
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 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.

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

<b>County</b>	<b>Primary Community</b>	<b>Levee Owner</b>	<b>USACE Program Levee</b>	<b>Levee Status</b>
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.<sup>xxv</sup>

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.

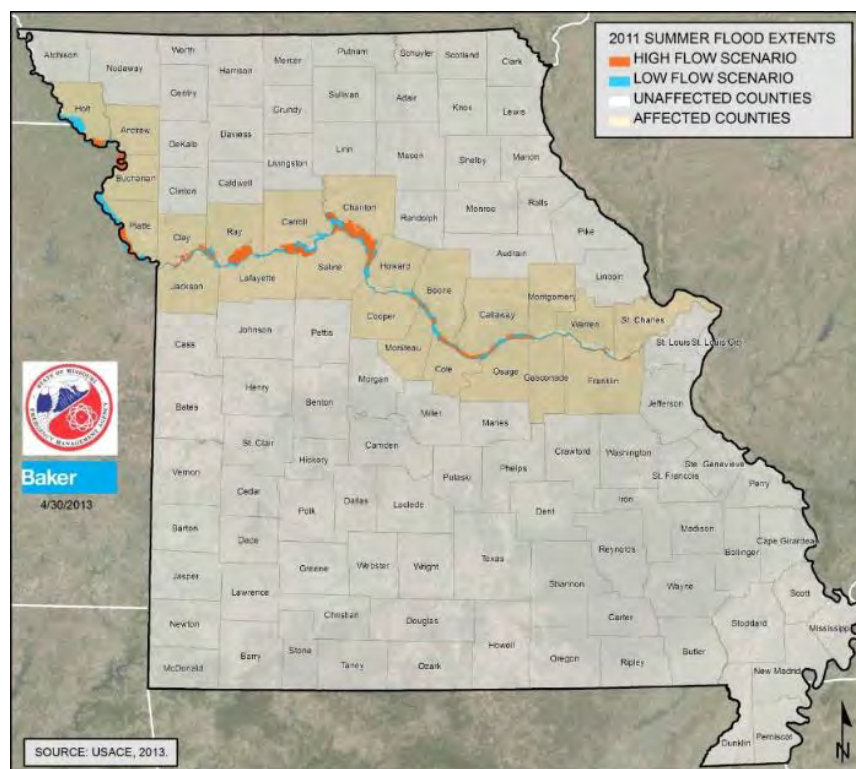
According to SEMA, this flood brought issues related to levees to the forefront.<sup>xxvi</sup> The flood approached or exceeded the 100-year threshold on most major rivers and resulted in overtopping or failure of large numbers of levees, most of them agricultural levees that provided various levels 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.

USACE District	Federal	Non-Federal
Kansas City	6 of 48	810 of 810

Source: Missouri State Hazard Mitigation Plan

### **2011 Flooding Summary<sup>xxvii</sup>**

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 4.10.1**). 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 4.10.4: Summer Flood Extents (Missouri)<sup>xxviii</sup>**

### 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.<sup>xxix</sup>

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.<sup>xxx</sup>

**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.<sup>xxxii</sup> 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.<sup>xxxiii</sup>

**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."<sup>xxxiii</sup>

**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."<sup>xxxiv</sup>

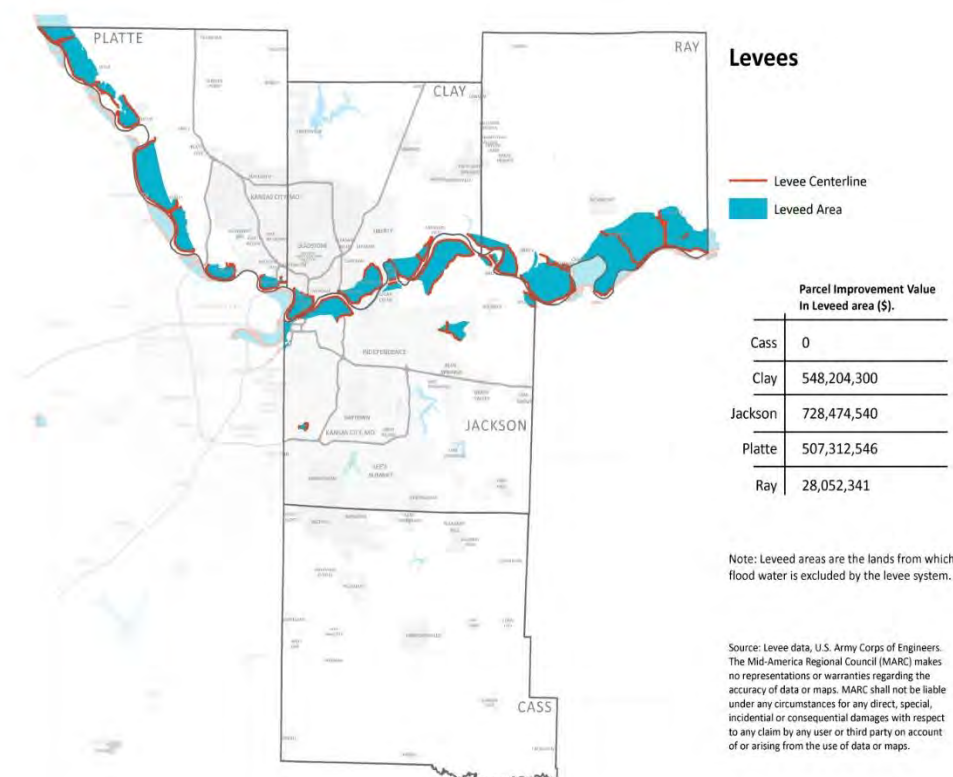
On June 24, 2019 Governor Mike Parson, Lt. Governor Mike Kehoe requested the President Donald Trump issue a major disaster declaration for flood, storm, and tornado damage beginning on April 29<sup>th</sup>, 2019. This declaration request involved 41 counties, Jackson and Platte among them. The Governor's request stated \$25 million in qualifying expenses that had already been identified.<sup>xxxv</sup> "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"<sup>xxxvi</sup>

**4.10.2 Probable Locations**

Magnitude 10%-15%

**Figure 4.10.3 Location of Levees and Protected Areas** depicts the leveed 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 4.10.5: Location of Levees and Protected Areas, Kansas City Region**

### 4.10.3 Impact

Data for levee failure was produced and provided by SEMA. SEMA’s methodology estimation for the 2018 Missouri State Hazard Mitigation Plan is excerpted below. Table and figure numberings have been changed to correspond to sequencing in this Plan.

“According to the MLI, 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 topplings 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.<sup>xxxvii</sup>

#### 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. Those areas most at risk are depicted in the map above which identifies the potential area impacted and includes the total improved parcel value by county that would be at risk if the levee failed (see figure 4.5.6). Table 4.5.4 below is the resultant potential loss estimates for jurisdictions within the levee protected areas (\*asterisks indicate the community is a current plan participant).

City	Total Building Value	Total land Value	Total Value	City	Total Building Value	Total land Value	Total Value
<b>Cass County</b>	No risk			<b>Clay County*</b>	\$548,204,300	\$281,844,500	\$830,048,800
<b>Jackson County*</b>	\$728,474,540	\$205,133,266	\$933,607,806	<b>Platte County*</b>	\$507,312,546	\$63,719,224	\$571,031,770
<b>Ray County*</b>	\$28,052,341	\$27,726,259	\$55,778,600	<b>Liberty*</b>	\$46,700	\$1,771,200	\$1,817,900
<b>Birmingham</b>	\$26,280,600	\$4,640,500	\$30,921,100	<b>Missouri City</b>	\$1,164,500	\$463,700	\$1,628,200
<b>Camden</b>	\$0	\$63,680	\$63,680	<b>North Kansas City*</b>	\$345,595,200	\$207,965,200	\$553,560,400
<b>Farley*</b>	\$1,101,561	\$4,403,306	\$5,504,867	<b>Parkville*</b>	\$10,967	\$1,148,209	\$1,159,176
<b>Fleming</b>	\$0	\$468,040	\$468,040	<b>Randolph</b>	\$2,217,800	\$4,104,300	\$6,322,100
<b>Harden</b>	\$16,600,690	\$593,120	\$17,193,810	<b>Riverbend</b>	\$0	\$98,900	\$98,900
<b>Henrietta</b>	\$6,281,660	\$437,210	\$6,718,870	<b>Riverside*</b>	\$204,336,624	\$36,368,504	\$240,705,128
<b>Independence*</b>	\$25,332,006	\$13,217,713	\$38,549,719	<b>Sugar Creek</b>	\$9,742,229	\$1,361,080	\$11,103,309
<b>Kansas City*</b>	\$875,002,623	\$248,542,150	\$1,123,544,773	<b>Weston*</b>	\$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.<sup>xxxviii</sup>

Dam failures are most likely to happen for the following reasons<sup>xxxix</sup>:

- **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.<sup>xl</sup>

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.<sup>xli</sup>

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.<sup>xlii</sup>

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.<sup>xliii</sup> 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),<sup>xliv</sup> 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.

<b>Table 4.11.1: Dams by Hazard Level, Owner Type and Height by County</b>						
<b>Owner Type</b>	<b>High Hazard</b>	<b>&gt;35'</b>	<b>Significant</b>	<b>&gt; 35'</b>	<b>Low Hazard</b>	<b>&gt;35'</b>
<b>Cass County</b>						
Local Government	5	1	0	0	3	0
Private	23	4	3	2	36	0
<b>Clay County</b>						
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
<b>Jackson County</b>						
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
<b>Platte County</b>						
Local Government	1	1	0	0	0	0
Private	16	4	0	0	13	0
<b>Ray County</b>						
Local Government	4	2	1	0	10	0
Private	8	3	5	0	20	1
<b>Total</b>						
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
<b>Total</b>	<b>123</b>	<b>39</b>	<b>10</b>	<b>2</b>	<b>136</b>	<b>5</b>

**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** on the following page 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.<sup>xiv</sup> As a mitigation measure, stakeholders are encouraged to review the MDNR information on local dams to develop and implement mitigation measures.

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
<b>Total</b>	<b>28</b>	<b>10</b>	<b>4</b>	<b>36</b>	<b>2</b>	<b>4</b>

*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.<sup>xlvi</sup> 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	Harrisonville City Lake Dam	1	High	Local Govt.	55	13520	Recreation	Earth	TR-Middle Big Creek	Pleasant Hill	4
Cass	Lake Winnebago Dam	1	High	Private	64	7150	Recreation	Earth	Middle Big Creek	Latour	21
Cass	Raintree Lake Dam	1	High	Private	55	7220	Recreation	Earth	Middle Big Creek	Pleasant Hill	8
Cass	Mill Creek Dam	1	High	Private	62	3850	Recreation	Earth	Mill Creek	Belton	-
Cass	Lake Winnebago Dam Extension	1	High	Private	63	13700	-	-	-	Lake Winnebago	-
Clay	Holly Lake Dam	1	High	Private	40	140	Recreation	Earth	TR-Little Shoal Creek	Liberty	-
Clay	Watkins Mill State Park Dam	2	High	State	56	2600	Recreation	Earth	TR-Williams Creek	Prathersville	6
Clay	Meadow Lake Estates Dam	2	High	Private	47	400	-	-	-	-	-
Clay	Williams Creek #4 Dam	3	Low	State	47	598	Flood Control	Earth	TR to Williams Creek	Mosby	3
Clay	Helvey Park Dam	3	Low	Local Govt.	36	203	Water Supply	Earth	TR-Wilkerson Creek	Smithville	1
Jackson	Prairie Lee Lake Dam	1	High	Local Govt.	69	6000	Recreation	Earth	East Fork Little Blue River	Blue Springs	-
Jackson	Lake Jacomo Dam	1	High	Local Govt.	74	38620	Recreation	Earth	East Fork Little Blue River	Lee's Summit	-
Jackson	Unity #1 Dam	1	High	Private	48	285	Water Supply	Buttress	TR-Little Cedar Creek	Unity Village	-
Jackson	Lake Tapawingo Dam	1	High	Private	55	2000	Recreation	Earth	TR-East Fork Little Blue River	Independence	-
Jackson	Whispering Hills Lake Dam	1	High	Private	40	190	Recreation	Earth	TR-Round Grove Creek	Kansas City	-
Jackson	Unity #2 Dam	1	High	Private	52	618	Recreation	Earth	TR-Little Cedar Creek	Kansas City	2
Jackson	Tom Smith Lake-East Dam	1	High	Private	55	127	Recreation	Earth	TR-Blue River	Kansas City	3
Jackson	View High Lake Dam	1	High	Private	37	148	Recreation	Earth	TR-Little Blue River	Kansas City	1
Jackson	Lakewood-West Dam	1	High	Private	84	6000	Recreation	Earth	West Fork of May Brook	Lee's Summit	1
Jackson	Lakewood-East Dam	1	High	Private	75	4810	Recreation	Earth	West Fork of May Brook	Lee's Summit	1
Jackson	Barber Lake Dam	1	High	Private	57	2186	Recreation	Earth	TR to West Fork Sni-A-Bar Creek	Lake Lotawana	2
Jackson	Lone Jack Lake Dam	1	High	State	47	660	Flood Control	Earth	TR to the Sni-A-Bar	Lone Jack	25
Jackson	Doult Lake Dam	1	High	Private	38	86	Water Supply	-	TR to Rock Creek	Independence	-

**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)
Jackson	Rosenfelt Dam	1	High	Private	57	400	Recreation	Earth	Unnamed TR to Blue River	Grandview	1
Jackson	Tom Smith Lake-South Dam	1	High	Private	57	650.79	-	-	TR-Blue River	Stanley, Ks.	5
Jackson	Tom Smith Lake-West Dam	1	High	Private	50	302	-	-	TR-Blue River	Stanley, Ks.	5
Jackson	Lake Lotawana Dam	2	High	Private	58	11568	Recreation	Earth	West Fork Sni-A-Bar Creek	Tarsney Lakes	3
Jackson	Adams Dairy Parkway Dam	2	High	Local Govt.	48	876	Flood Control	Earth	TR-Blue Branch	Grain Valley	3
Jackson	Commandeer Lake Dam	3	Low	Private	42	56	Recreation	Earth	TR-East Fork Little Blue River	Independence	1
Jackson	Carp Lake Dam	3	Low	Private	45	83	Recreation	Earth	TR-Little Blue River	Lee's Summit	1
Platte	Weatherby Lake Dam	1	High	Private	85	5750	Recreation	Earth	Rush Creek	Parkville	3
Platte	Lake Waukomis Dam	1	High	Private	68	2292	Recreation	Earth	TR-Line Creek	Lake Waukomis	-
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	-	-	-	-	-
Platte	International Airport Dam	2	High	Local Govt.	45	1670	Flood Control	Earth	TR-Todd Creek	Platte City	16
Ray	Lawson City Lake Dam	1	High	Local Govt.	45	380	Water Supply	Earth	Brushy Creek	Elmira	11
Ray	Crystal Lake Dam	1	High	Private	54	2846	Recreation	Earth	Fishing River	Excelsior Springs	1
Ray	Willow Creek Watershed Site A-1	2	High	Local Govt.	43	2000	Flood Control	Earth	Willow Creek	Henrietta	2
Ray	Hidden Valley Lake Dam	2	High	Private	52	454	Recreation	Earth	TR to Rocky Fork	Hardin	-
Ray	Hedges Lake Dam	2	High	Private	43	115	Recreation	Earth	TR-Shackleford Branch	Orrick	-



### 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<sup>xlvii</sup>:

- 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

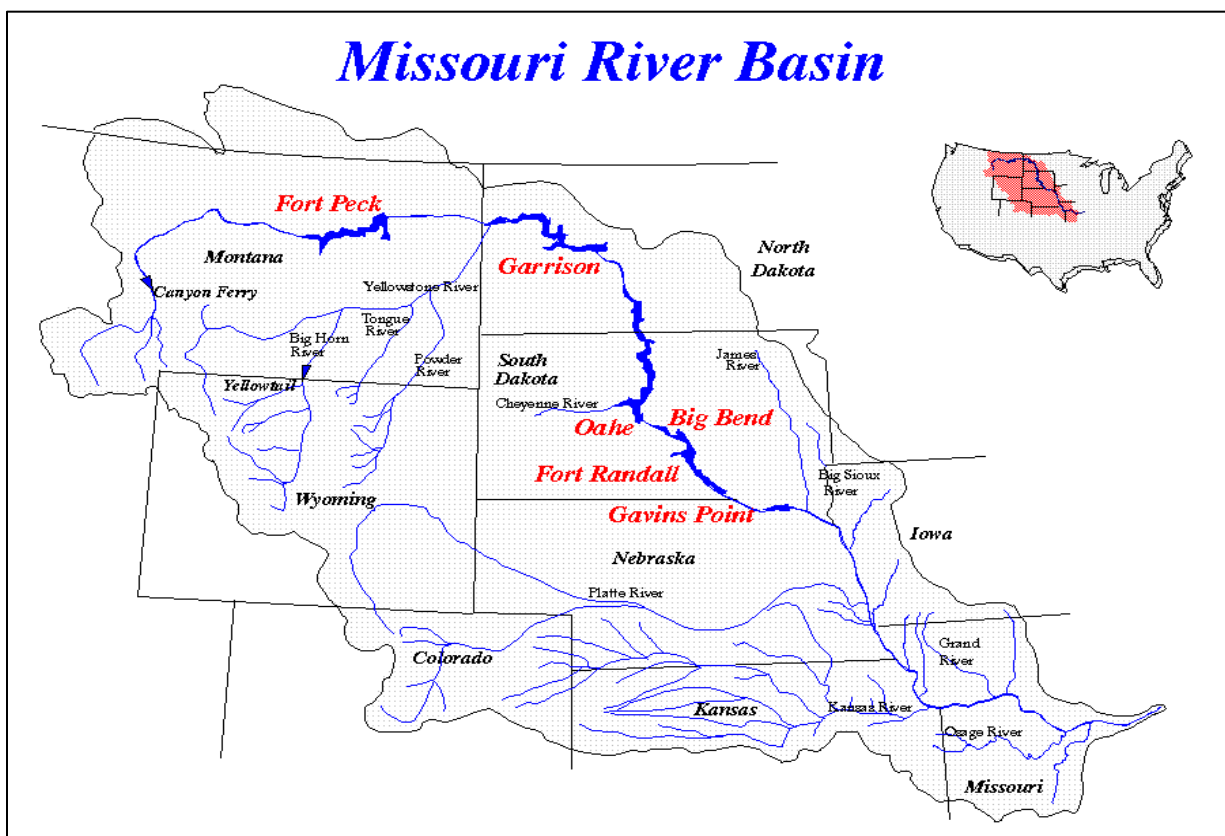
Potential speed of onset (probable amount of warning time):

- 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

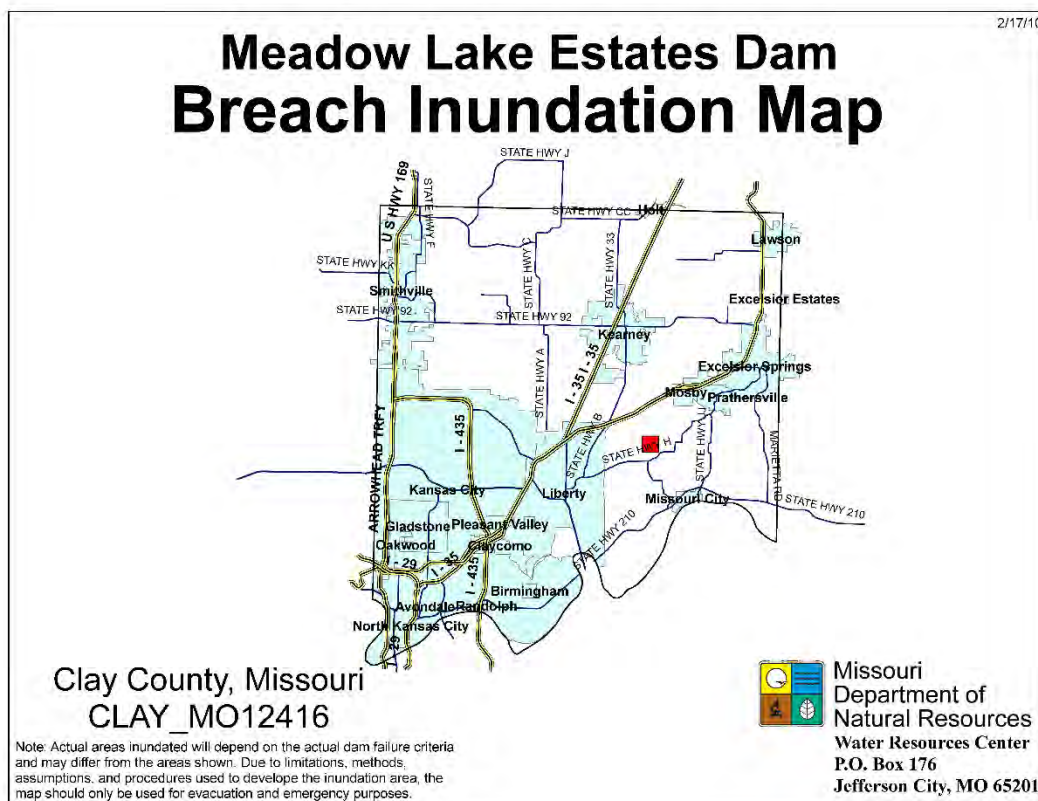
**Map 4.11.1: USACE Main Stem Dams in the Upper Missouri River Basin**

#### 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.<sup>xlviii</sup> Inundation maps are currently available for Jackson County.



**Map 4.11.2: Sample Inundation Map**

Because inundation pathways are not largely available, the statistical risk assessment methodology was used to estimate loss for dam failures. Table 4.11.4 and Table 4.11.5 are the maximum and minimum loss estimate calculations. Jurisdictional flood analysis maps with parcel data demonstrate the location and impact area of potential dam failures to the region were included in the 2015 plan.

#### 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.

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<sup>i</sup> FEMA Website, Floods and Flash Floods Fact Sheet

<sup>ii</sup> SEMA State Hazard Analysis, Annex B

<sup>iii</sup> USA Today, online data

<sup>iv</sup> SEMA State Hazard Analysis, Annex B

<sup>v</sup> FEMA Web site, Floods and Flash Floods Fact Sheet, online document

<sup>vi</sup> USACE Walla Walla District, online data

<sup>vii</sup> SEMA State Hazard Analysis, Annex B

<sup>viii</sup> BCN Web site, online data

<sup>ix</sup> PBS, online data

<sup>x</sup> FEMA Web site, Floods and Flash Floods Fact Sheet, online document

<sup>xi</sup> FEMA Web site, Floods and Flash Floods Fact Sheet, online document

<sup>xii</sup> Pima County Flood Control District Web site, online data

<sup>xiii</sup> SEMA State Hazard Analysis, Annex B

<sup>xiv</sup> 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>

<sup>xv</sup> 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>

<sup>xvi</sup> NWS Missoula Web site, online data

<sup>xvii</sup> NWS, *July 27, 2017 Heavy Rain and Catastrophic Flooding in Kansas City*, <https://www.weather.gov/eax/July26-272017MajorFloodingAcrossKansasCityMetro>

<sup>xviii</sup> NWS in Pleasant Hill, *Significant Flooding Event of August 21<sup>st</sup>-22<sup>nd</sup>, 2017*, <https://www.weather.gov/eax/SignificantFloodingEventofAugust21st-22nd2017>

<sup>xix</sup> Missouri State Hazard Mitigation Plan, State Estimates of Potential Loss, pg. 3.108-3.109

<sup>xx</sup> Missouri State Hazard Mitigation Plan,

[http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO\\_Hazard\\_Mitigation\\_Plan\\_2013.pdf](http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf)

<sup>xxi</sup> Jackson County, MO Sheriff's Office, <https://www.kshb.com/news/local-news/water-rescue-in-levee-as-levee-breaches>

<sup>xxii</sup> FEMA Web site, "So You Live Behind a Levee," <http://content.asce.org/ASCELeveeGuids.html>

<sup>xxiii</sup> National Committee on Levee Safety, Recommendations for a National Levee Safety Program, [http://www.leveesafety.org/lv\\_links.cfm](http://www.leveesafety.org/lv_links.cfm)

<sup>xxiv</sup> Missouri State Hazard Mitigation Plan

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- <sup>xxv</sup> Missouri State Hazard Mitigation Plan
- <sup>xxvi</sup> Missouri State Hazard Mitigation Plan
- <sup>xxvii</sup> FEMA Local Planning Guide
- <sup>xxviii</sup> Narratives from NOAA Storm Events Database
- <sup>xxviii</sup> Narratives from NOAA Storm Events Database
- <sup>xxviii</sup> FEMA, <https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri>
- <sup>xxviii</sup> FEMA, <https://www.fema.gov/news-release/2019/05/21/president-donald-j-trump-approves-major-disaster-declaration-missouri>
- <sup>xxviii</sup> 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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- <sup>xxviii</sup> Missouri Governor Michael L. Parson, <https://governor.mo.gov/press-releases/archive/missouri-requests-second-federal-disaster-declaration-year-response-flooding>
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- <sup>xxviii</sup> USGS, Geological Survey Professional Paper 1183, Online, <http://pubs.usgs.gov/pp/p1183/pp1183.html>
- <sup>xxviii</sup> SEMA State Hazard Analysis, Annex G, [http://sema.dps.mo.gov/newspubs/publications/hazard\\_analysis.php](http://sema.dps.mo.gov/newspubs/publications/hazard_analysis.php)
- <sup>xxviii</sup> American Association of Dam Safety Officials; <http://www.damsafety.org/news/?p=c0fdade4-ab98-4679-be22-e3d7f14e124f>
- <sup>xxviii</sup> SEMA State Hazard Analysis, Annex G
- <sup>xxviii</sup> SEMA State Hazard Analysis, Annex G
- <sup>xxviii</sup> SEMA State Hazard Analysis, Annex G
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- <sup>xxviii</sup> Missouri Office of Dam Safety/USACE National Inventory of Dams Webb site, <http://nid.usace.army.mil>
- <sup>xxviii</sup> <http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm>
- <sup>xxviii</sup> Glenn Lloyd, Missouri Dam Safety Program, Phone Interview, May 21, 2015
- <sup>xxviii</sup> USACE Omaha District Web site, <http://www.nwo.usace.army.mil/Missions/DamandLakeProjects/MissouriRiverDams.aspx>
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- xxxvi SEMA State Hazard Analysis, Annex G
- xxxvi SEMA State Hazard Analysis, Annex G
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- <sup>xxxvi</sup> Glenn Lloyd, Missouri Dam Safety Program, Phone Interview, May 21, 2015
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- <sup>xliv</sup> Missouri Office of Dam Safety/USACE National Inventory of Dams Webb site, <http://nid.usace.army.mil>
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# 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

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## 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.<sup>i</sup>

**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.<sup>ii</sup>

**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. To better display drought conditions over the last five years, **Map 4.12.1 through Map 4.12.10** are two-map sets, with the first map depicting drought conditions for the first or second week in August and the second map depicting how those conditions changed from the previous year. The July time frame was chosen as the mid-point of the typical drought season to present a snapshot of conditions. The maps were generated from the U.S Drought Monitor which produced by the National Drought Mitigation Center, The United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. The drought conditions map also includes information about the previous three months and preceding two months covering the entirety of the drought season.

Each two-map set provides a substantially accurate portrayal of how drought impacted the region over the last five years (2015-2019).

**U.S. Drought Monitor  
Missouri**

**July 14, 2015**

*(Released Thursday, Jul. 16, 2015)*

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	100.00	0.00	0.00	0.00	0.00	0.00
<b>Last Week</b> <i>7/7/2015</i>	100.00	0.00	0.00	0.00	0.00	0.00
<b>3 Months Ago</b> <i>4/14/2015</i>	89.86	10.14	0.00	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>12/31/2014</i>	91.56	8.44	0.00	0.00	0.00	0.00
<b>Start of Water Year</b> <i>9/30/2014</i>	85.62	34.38	2.71	0.00	0.00	0.00
<b>One Year Ago</b> <i>7/15/2014</i>	70.03	29.97	9.54	0.00	0.00	0.00



*Intensity:*

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

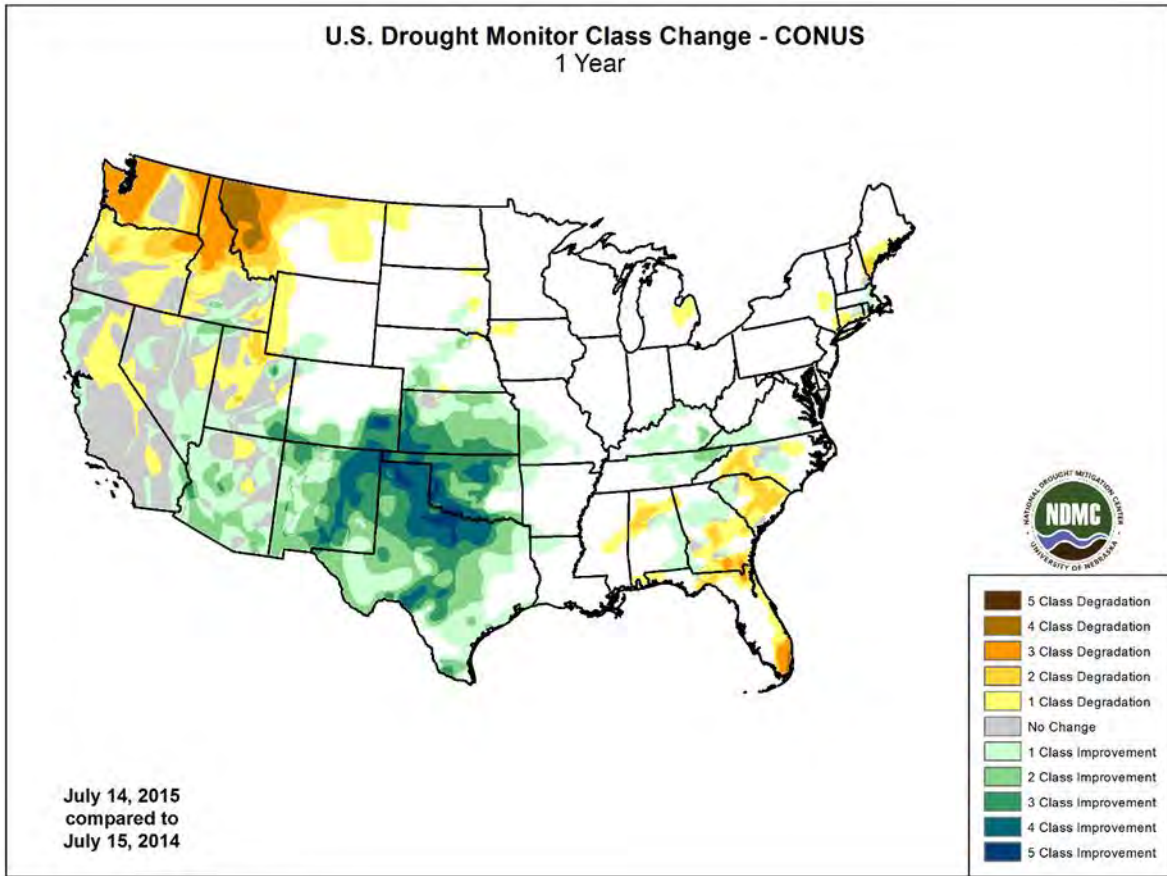
**Author:**

David Simeral  
Western Regional Climate Center



<http://droughtmonitor.unl.edu/>

**Map 4.12.1: Missouri Drought Conditions (2015)**



<http://droughtmonitor.unl.edu>

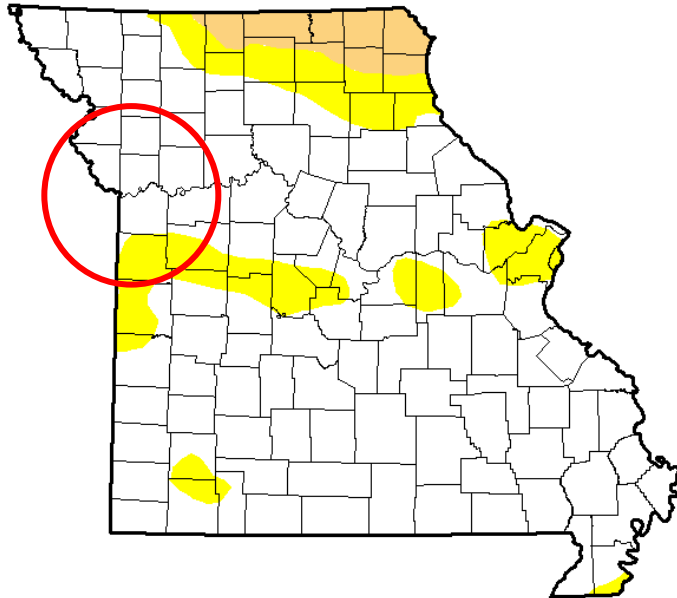
**Map 4.12.2: Change in Drought Conditions (2014-2015)**

## U.S. Drought Monitor Missouri

**July 19, 2016**

(Released Thursday, Jul. 21, 2016)

Valid 8 a.m. EDT



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	81.87	18.13	4.32	0.00	0.00	0.00
<b>Last Week</b> <i>7/12/2016</i>	81.17	18.83	4.32	0.00	0.00	0.00
<b>3 Months Ago</b> <i>4/19/2016</i>	31.74	68.26	6.12	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>12/29/2015</i>	100.00	0.00	0.00	0.00	0.00	0.00
<b>Start of Water Year</b> <i>9/29/2015</i>	69.09	30.91	0.00	0.00	0.00	0.00
<b>One Year Ago</b> <i>7/21/2015</i>	100.00	0.00	0.00	0.00	0.00	0.00

**Intensity:**

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

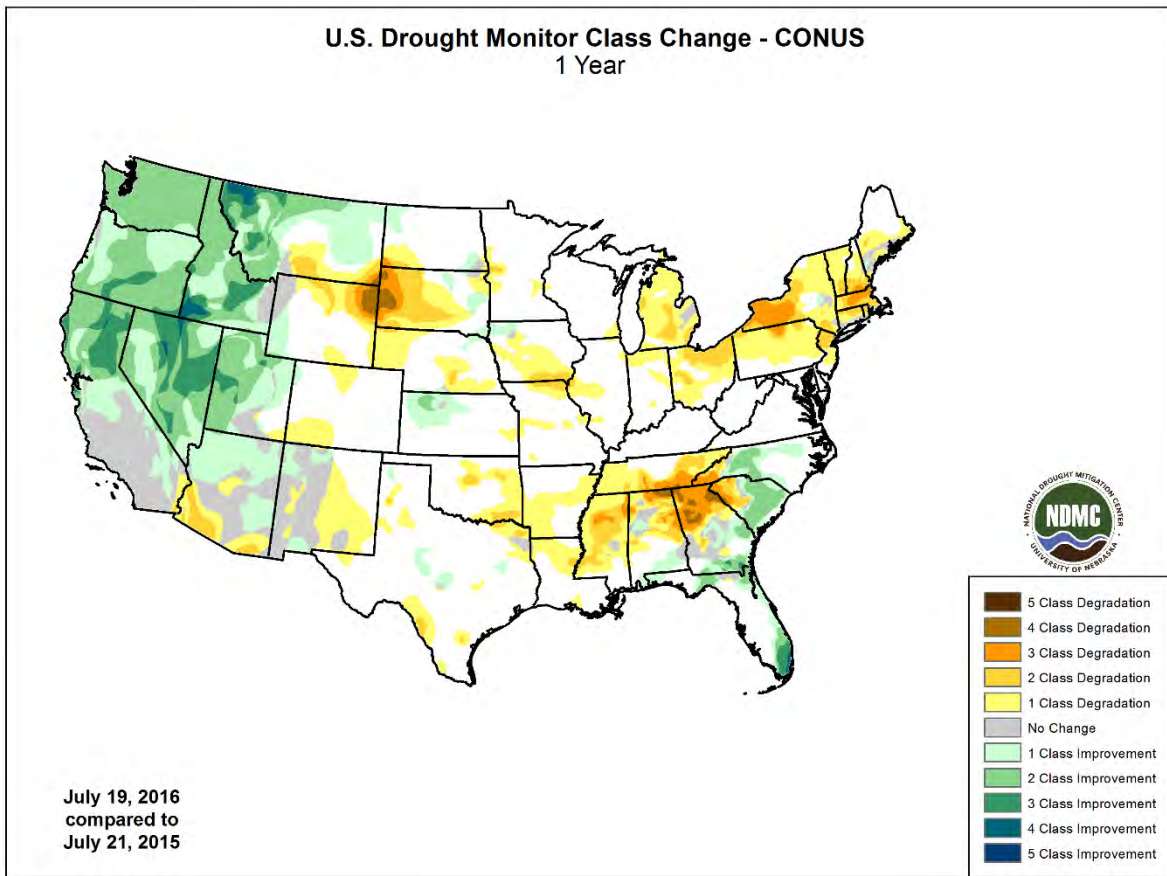
**Author:**

Chris Fenimore  
NCEI/NESDIS/NOAA



<http://droughtmonitor.unl.edu/>

**Map 4.12.3: Missouri Drought Conditions (2016)**



<http://droughtmonitor.unl.edu>

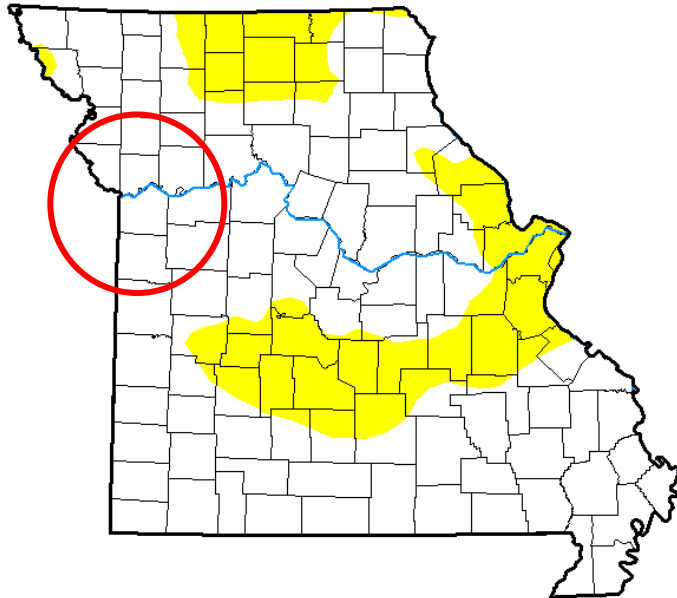
**Map 4.12.4: Change in Drought Conditions (2015-2016)**

## U.S. Drought Monitor Missouri

**July 18, 2017**

(Released Thursday, Jul. 20, 2017)

Valid 8 a.m. EDT



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	77.50	22.50	0.00	0.00	0.00	0.00
<b>Last Week</b> <small>07-11-2017</small>	94.33	5.67	0.02	0.00	0.00	0.00
<b>3 Months Ago</b> <small>04-18-2017</small>	51.55	48.45	0.13	0.00	0.00	0.00
<b>Start of Calendar Year</b> <small>01-03-2017</small>	10.49	89.51	26.62	0.00	0.00	0.00
<b>Start of Water Year</b> <small>09-27-2016</small>	99.74	0.26	0.00	0.00	0.00	0.00
<b>One Year Ago</b> <small>07-19-2016</small>	81.87	18.13	4.32	0.00	0.00	0.00

*Intensity:*

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

*Author:*

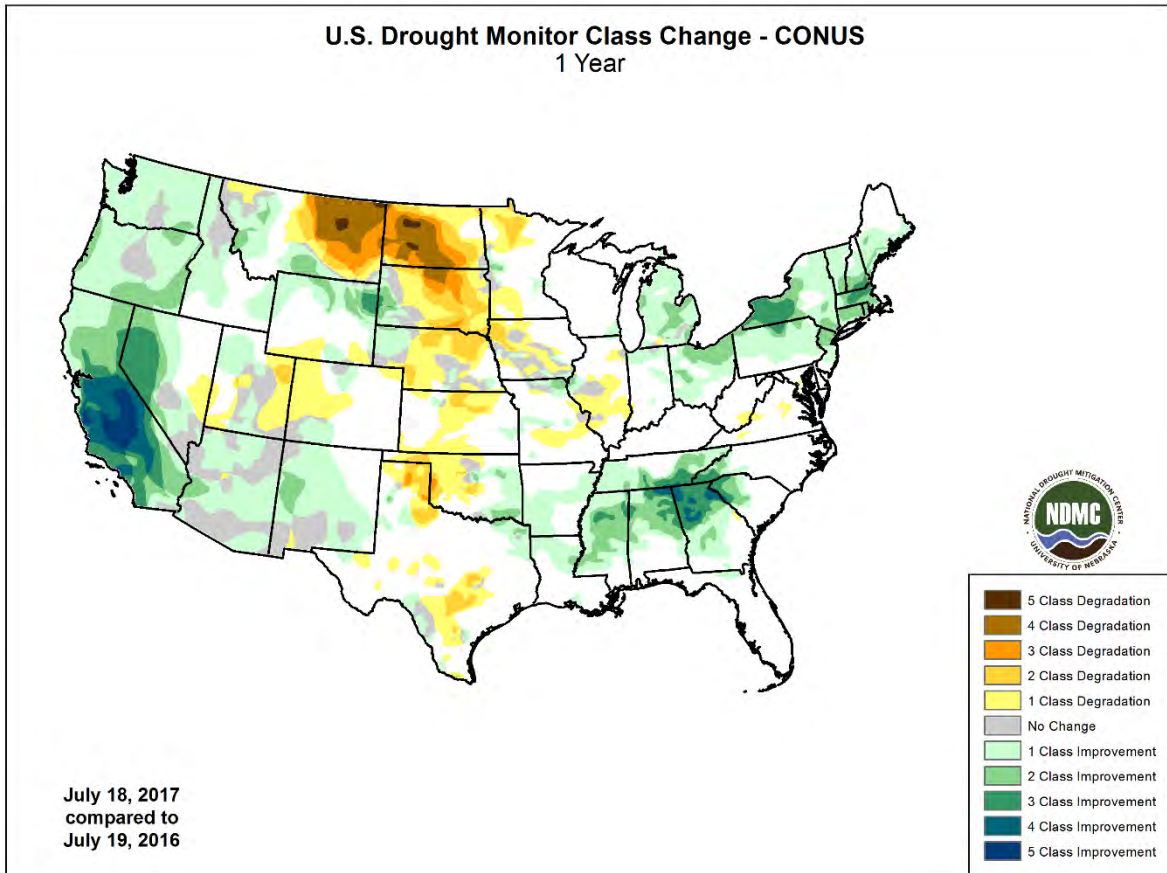
Richard Heim  
NCEI/NOAA



<http://droughtmonitor.unl.edu/>

**Map 4.12.5: Missouri Drought Conditions (2017)**





<http://droughtmonitor.unl.edu>

**Map 4.12.6: Changes in Drought Conditions (2016-2017)**

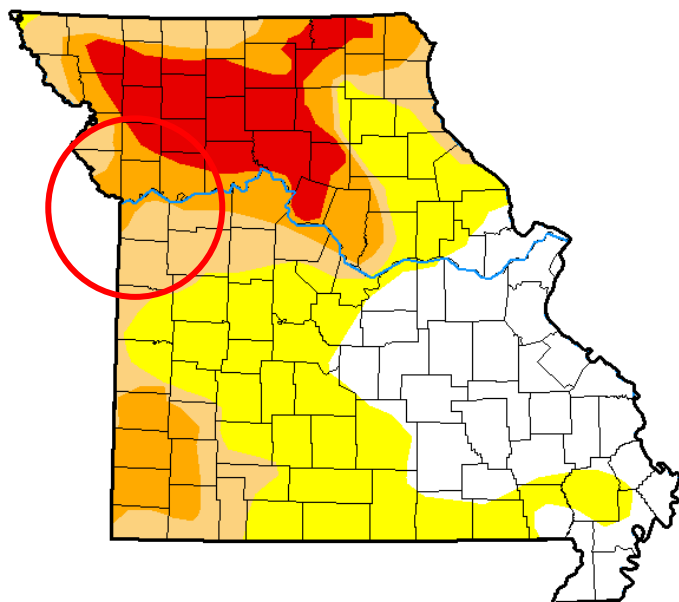


## U.S. Drought Monitor Missouri

**July 17, 2018**

(Released Thursday, Jul. 19, 2018)

Valid 8 a.m. EDT



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	26.43	73.57	42.83	26.24	10.93	0.00
<b>Last Week</b> <i>07-10-2018</i>	31.25	68.75	42.21	24.61	8.21	0.00
<b>3 Months Ago</b> <i>04-17-2018</i>	72.00	28.00	8.23	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>01-02-2018</i>	1.49	98.51	46.34	23.68	1.29	0.00
<b>Start of Water Year</b> <i>09-26-2017</i>	35.49	64.51	8.80	0.00	0.00	0.00
<b>One Year Ago</b> <i>07-19-2017</i>	77.50	22.50	0.00	0.00	0.00	0.00

*Intensity:*

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

*Author:*

Curtis Riganti  
National Drought Mitigation Center



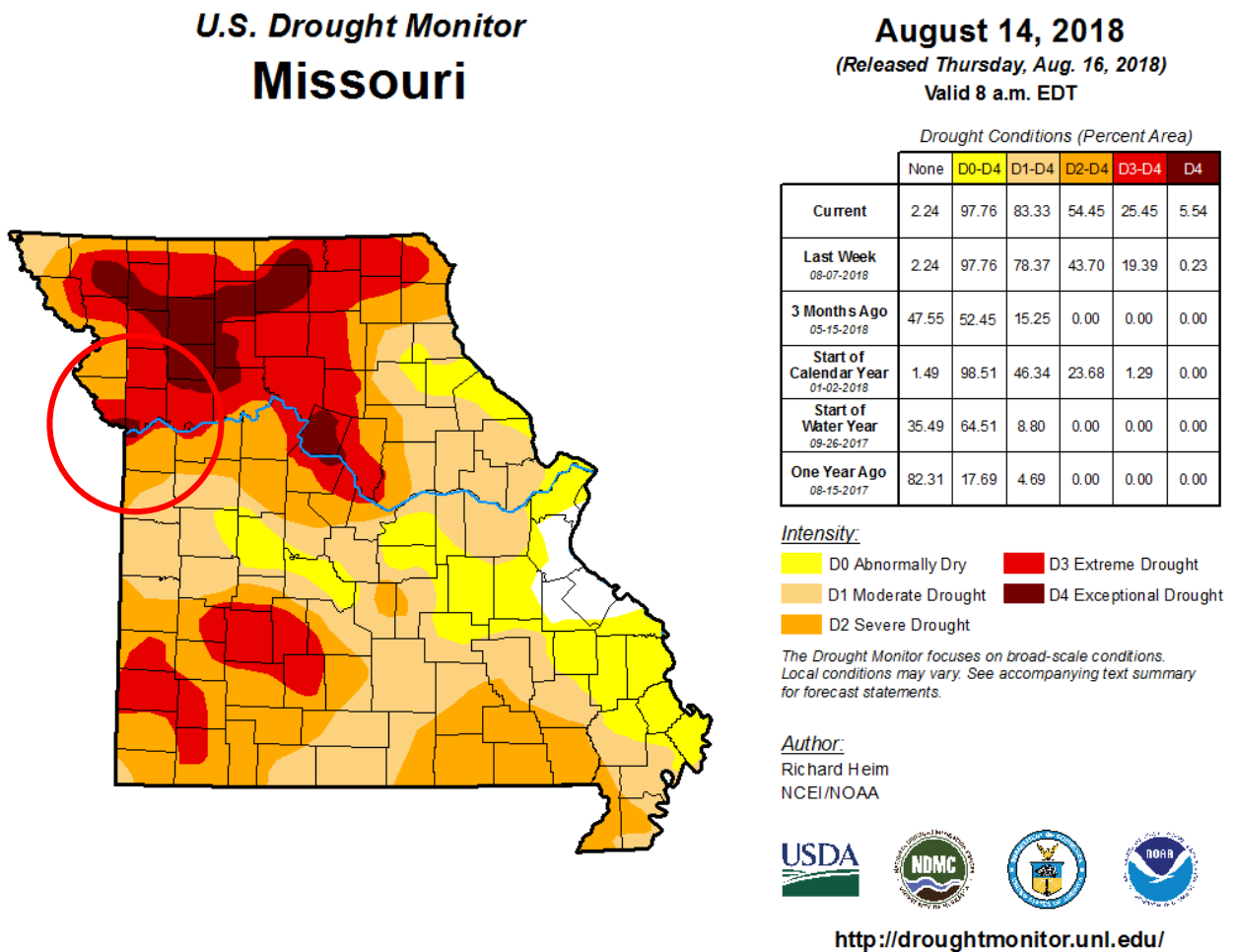
<http://droughtmonitor.unl.edu/>

**Map 4.12.7: Missouri Drought Conditions (2018)**

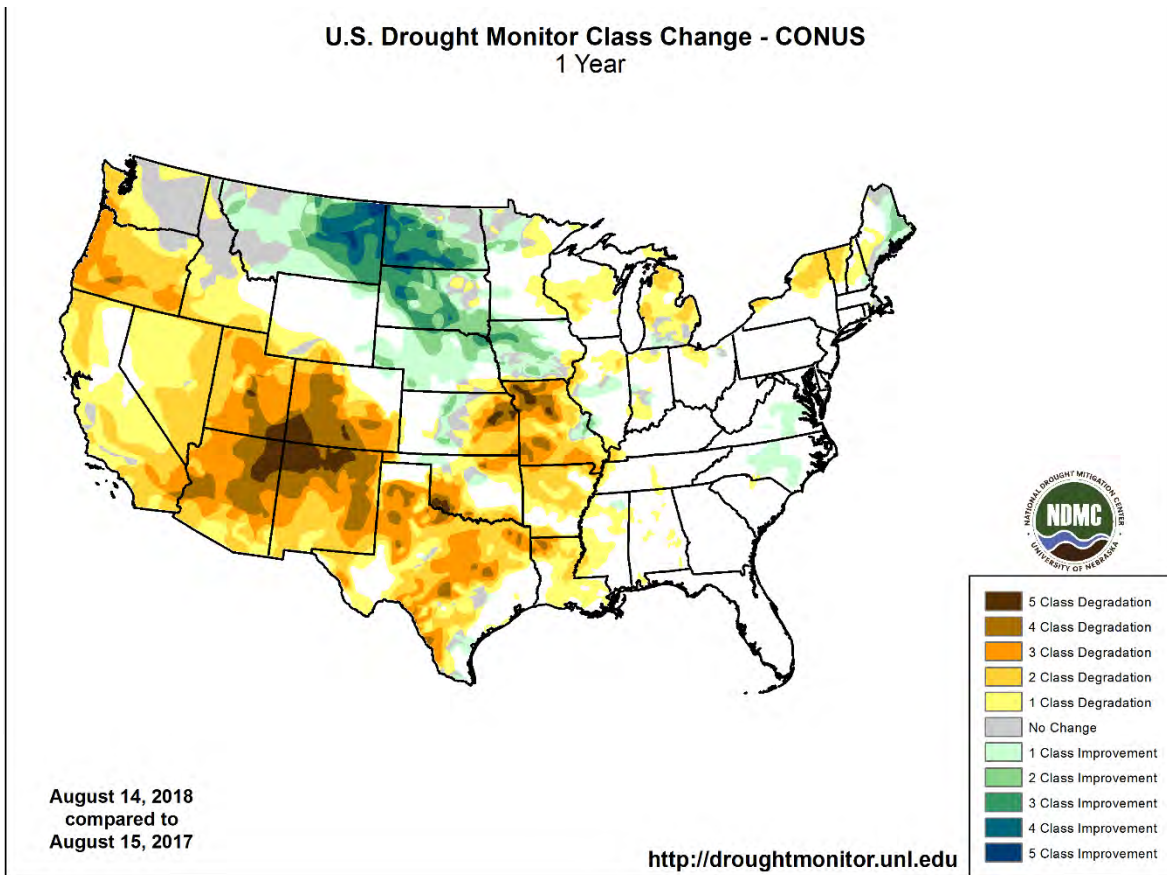
### Drought of 2018

Starting at the end of May and going into June, the US Drought Monitor at the University of Nebraska declared portions of Clay County in a D2 or worse drought. While impacts from this drought would be felt through the summer, it's unclear if any drought impacts were felt through the month of June.<sup>iii</sup> The abnormally dry summer continued into and through July for the Kansas City area. Clay, Jackson, Platte, and Ray County reached or maintained D4 drought status for the entire month of July and Cass county remained at the D2 status. While rain did move into the area through the month, the ground was dry enough from the below normal precipitation and above normal temperatures through the month to warrant D4 status continuation. The direct impact to Jackson County is unclear, but statewide drought impacts are estimated around 2 billion dollars, per The University of Missouri Extension Center. The drought also hurt pasture areas, with about three-quarters in poor or very poor conditions, according to the USDA report. Many pastures weren't been able to support grazing cattle, prompting farmers to feed cattle with hay that might normally be saved for winter. The hay crop was also affected, dropping one-third below its normal harvest. The 2018 drought turned out small corn ears. Some farmers did not wait

until harvest, instead trying to get the most out of the crop by baling it or cutting it for silage for cattle.<sup>iv</sup> The drought of 2018 continued for Platte County, however despite an influx of some moisture, only negligible relief came to the county. Conditions were held at D4 through the month of September, but the impacts and losses of several crops were already felt across the region. The amount of damages is unknown at this point, but numerous farmers were unable to get full return from their crops. Mid-August, seen in **Map 4.12.1**, was the peak of the drought for the Planning area, parts of Clay, Platte, and Jackson experienced exceptional drought. While other portions of those counties experienced extreme and severe drought.



**Map 4.12.8: Missouri Peak Drought Conditions in August 2018**



**Map 4.12.9: Changes in Drought Conditions (2017-2018)**

## U.S. Drought Monitor Missouri

**July 16, 2019**

(Released Thursday, Jul. 18, 2019)

Valid 8 a.m. EDT



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	100.00	0.00	0.00	0.00	0.00	0.00
<b>Last Week</b> <small>07-09-2019</small>	100.00	0.00	0.00	0.00	0.00	0.00
<b>3 Months Ago</b> <small>04-16-2019</small>	100.00	0.00	0.00	0.00	0.00	0.00
<b>Start of Calendar Year</b> <small>01-01-2019</small>	97.14	2.86	0.00	0.00	0.00	0.00
<b>Start of Water Year</b> <small>09-25-2018</small>	36.65	63.35	42.18	11.26	2.63	0.08
<b>One Year Ago</b> <small>07-17-2018</small>	26.43	73.57	42.83	26.24	10.93	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

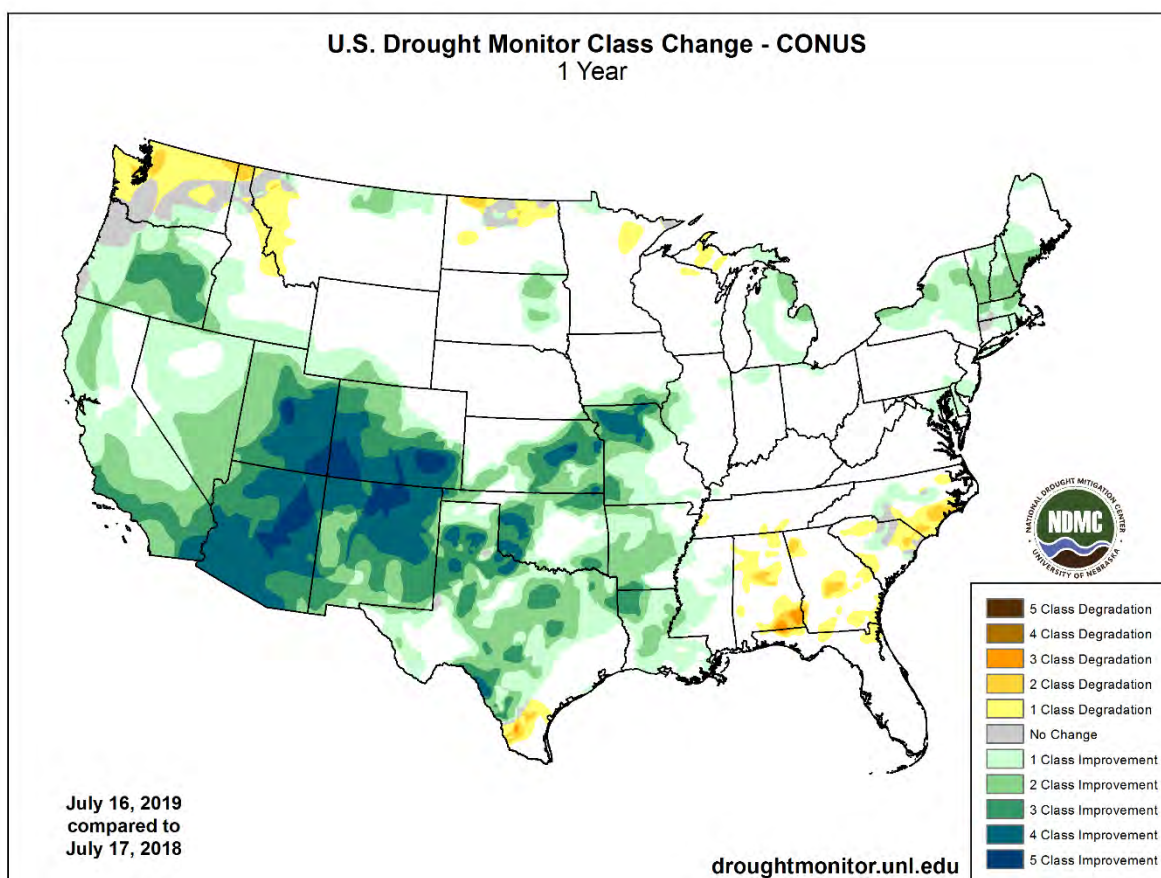
Author:

Brad Rippey  
U.S. Department of Agriculture



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

**Map 4.12.10: Missouri Drought Conditions (2019)**



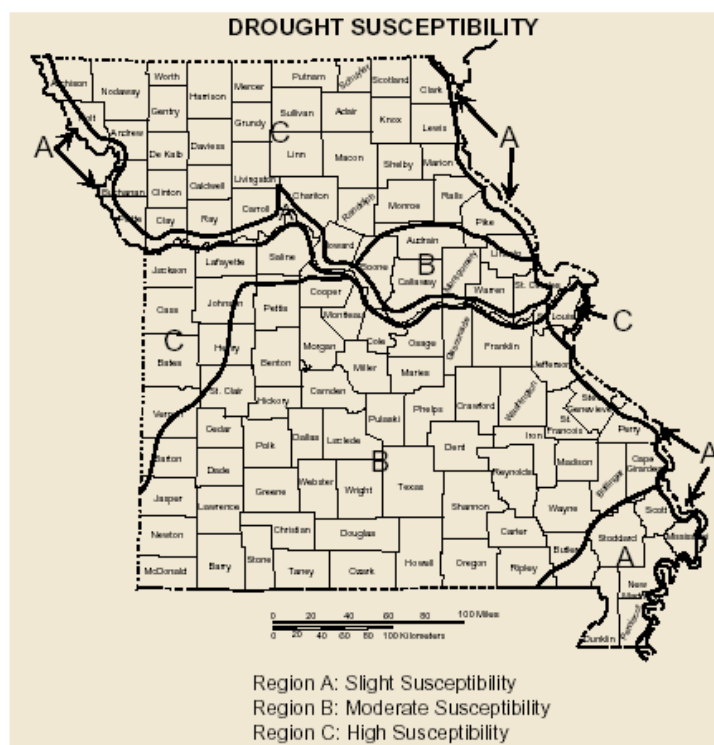
**Map 4.12.11: Changes in Drought Conditions (2018-2019)**

#### 4.12.2 Probable Locations

Magnitude >50%

As in the 2015 Plan, the entire planning area remains susceptible to drought. In its 2002 Missouri Drought Plan, MDNR divided the state into three regions of drought susceptibility: 1) Region A – Slight Susceptibility; 2) Region B – Moderate Susceptibility, and 3) Region C – High Susceptibility.<sup>v</sup> These drought susceptibility regions are depicted in **Map 4.12.11**. Portions of Clay, Jackson, Platte and Ray counties along the Missouri River are in Region A and have minor surface and groundwater drought susceptibility. Because these areas are underlaid by alluvial deposits of saturated sands and gravels, surface and groundwater resources are generally adequate for domestic, municipal and agricultural water needs. All of Cass County and the majority of Clay, Jackson, Platte and Ray counties are in Region C and are highly susceptible to drought. According to MDNR, sources of surface water in Region C are usually inadequate during extended periods of drought and groundwater is generally of poor quality and may only supply enough water for domestic needs. Irrigation is generally not feasible in these areas and when it is practical, the withdrawal of groundwater may affect other users. In many areas of Region C, surface water sources are used to supplement irrigation supplied by groundwater.<sup>vi</sup> The Missouri Drought Plan has not been updated or altered since 2002.

The entire Kansas City region is subject to the impacts of drought. Therefore, all counties were given a >50% magnitude rating.



Source: Missouri Drought Plan, Missouri Department of Natural Resources

**Map 4.12.12: Missouri's Drought Susceptibility Regions**

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.<sup>vii</sup>

#### 4.12.3 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.<sup>viii</sup>

In the fall of 2011, the Drought Impact Reporter was updated to collect and display more types of information, reclassifying some impact categories and adding new ones. **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.<sup>ix</sup>

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	62	-	-	11	17	19	2	-	7
Clay	54	1	-	10	15	20	1	1	6
Jackson	54	2	-	10	18	20	3	-	6
Platte	54	2	17	10	18	20	3	13	6
Ray	54	1	-	9	14	17	-	-	5

Source: National Drought Mitigation Center Website, Drought Impact Reporter

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	17	1	-	1	4	8	2	-	3
Clay	12	-	-	2	2	11	1	1	3
Jackson	10	2	-	10	18	20	3	1	6
Platte	15	-	-	4	5	10	1	-	5
Ray	12	1	-	1	2	9	-	-	2

Source: National Drought Mitigation Center Website, Drought Impact Reporter

#### **4.12.3a Drought Impact Reporter Categories\***

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.<sup>xi</sup>

#### **4.12.4 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.<sup>xii</sup> Data was retrieved for the time period of 2009-2019 in order to mirror the drought report/impact data in **Table 4.12.1** and **Table 4.12.2**. The below table, **Table 4.12.3**, 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.

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

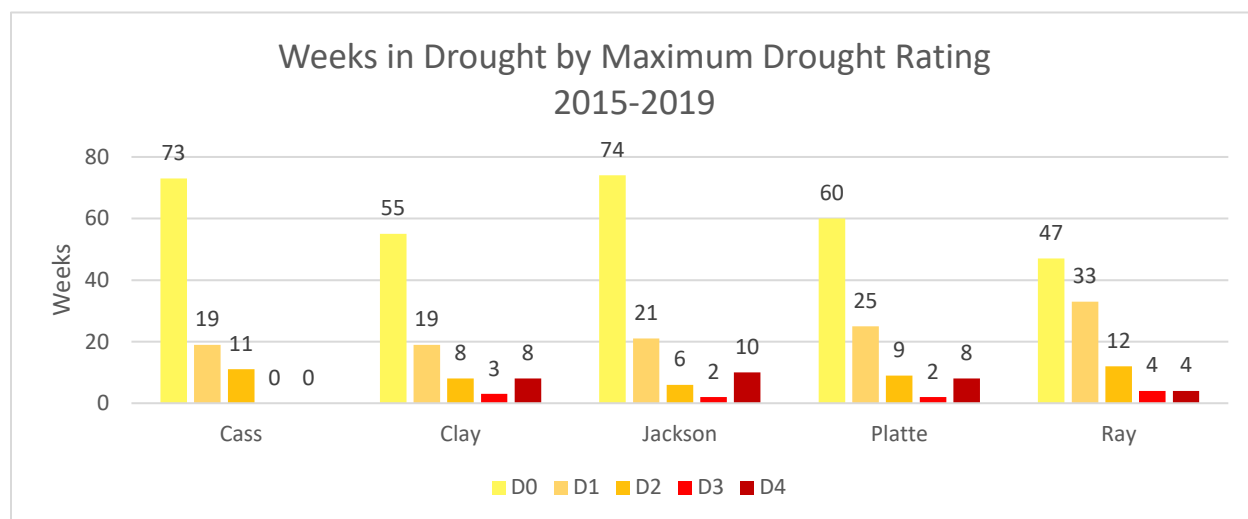
#### 4.12.5 Extent

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.”<sup>xiii</sup>

Table 4.12.4: Drought Classification							
Category	Description	Possible Impacts	Ranges				
			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

With data from the United States Drought Monitor, Figure 4.12.1 shows the number of weeks, since 2015, where each county experienced drought in any form. Because each county covers a wide area, counties experienced many weeks where portions of the area were classified as one rating and other portions of the county were classified by a different rating. To simplify the graph, a week was classified by the highest drought classification reached by any portion of the county. For instance, on the week of October 9, 2018, 6.62 percent of Platte County was in a D3 drought, 19.82 percent of the county was in a D2 drought, and the entire county qualified for a D1 drought. In this instance, the week of October 9, 2019 would be classified as D3.



Source: United States Drought Monitor, Comprehensive Statistics

**Figure 4.12.1: Number of Weeks in Drought by Maximum Drought Classification Rating, 2015-2019**

#### 4.12.6 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.<sup>xiv</sup>

#### 4.12.7 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."<sup>xv</sup>

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.<sup>xvi</sup>

Summarized in **Table 4.13.1** is a listing of heat events from 2010 to 2018. This table includes heat events from the 2015 Plan because there have been no heat events reported to NOAA since the previous plan.

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 by 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	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							
Platte							
Cass							
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 counties 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.<sup>xvii</sup> 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.<sup>xviii</sup> Table 4.13.2 below describes the possible impacts to health from prolonged heat exposure.

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.<sup>xix</sup>

#### 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.

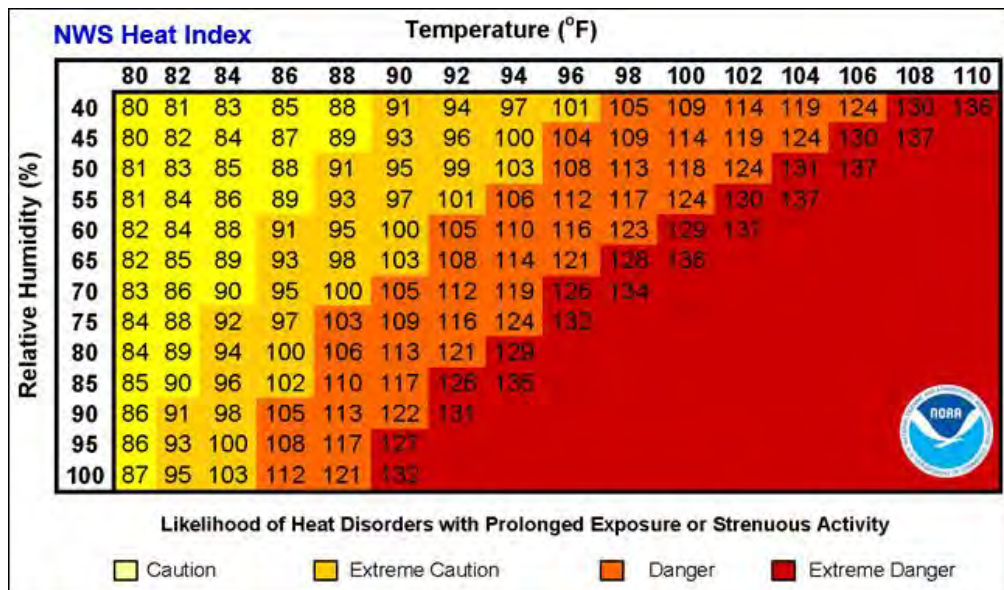
***Excessive Heat Warning/Advisories*** – issued when an excessive heat event is expected in the next 36 hours. These products are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life. Warnings 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.<sup>xx</sup>



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.<sup>xxi</sup> 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.<sup>xxii</sup> 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.<sup>xxiii</sup>



**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

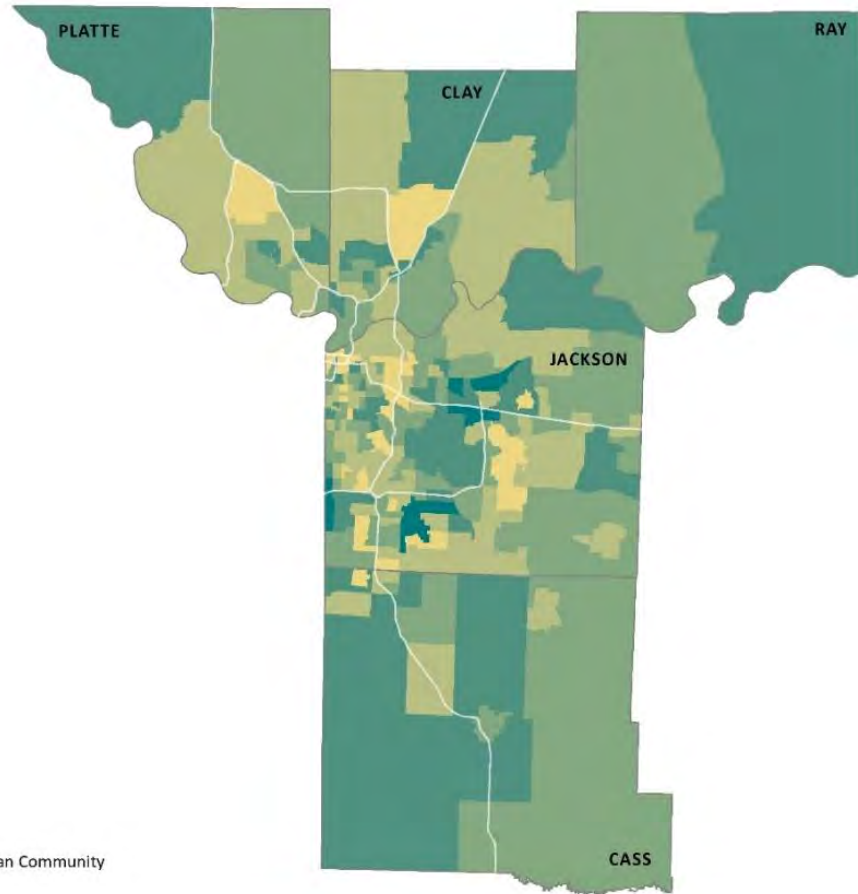
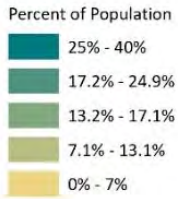
The impact of heat waves is generally limited for most of the population in the metropolitan area, although they can be more severe for the urban areas and at-risk groups described in *Section 4.13.3*. Socioeconomic problems associated with certain urban populations exacerbate the hazards of heat waves. 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.<sup>xxiv</sup>

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 median household income. For a household of four, the 2019 federal poverty level is \$25,750 of annual income.<sup>xxv</sup> Map 4.13.3 depicts the disabled population in the Kansas City metropolitan area.

### Population Age 65 or Over (%)

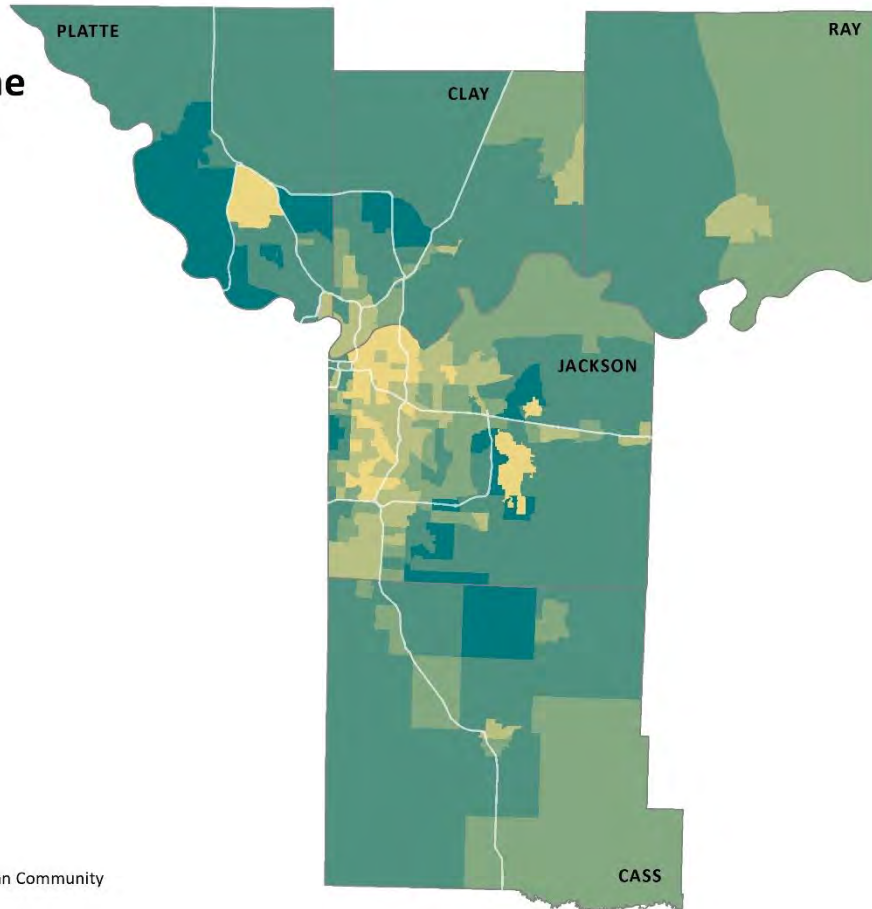
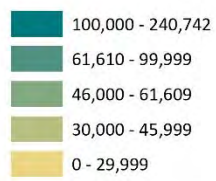


Data source: U.S. Census Bureau, American Community Survey 2017 5-year tract data.

Source: MARC Research Services Department

**Map 4.13.1:** Population Over age 65 in the Kansas City Metropolitan Area

### Median Household Income

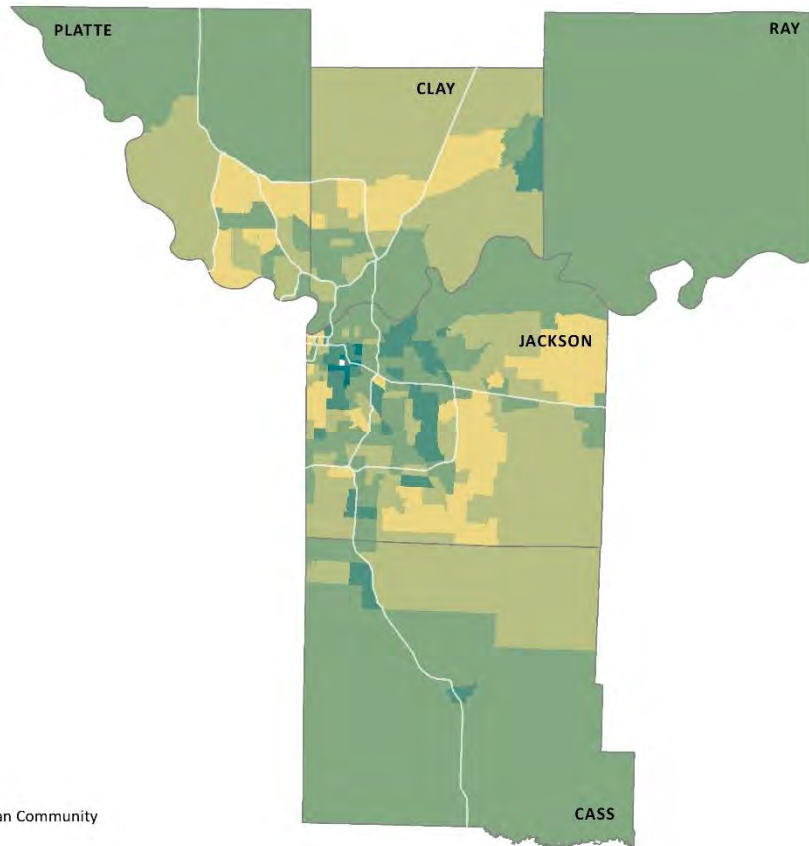
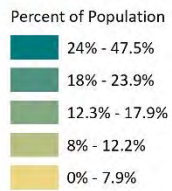


Data source: U.S. Census Bureau, American Community Survey 2017 5-year tract data.

Source: MARC Research Services Department

**Map 4.13.2: Median Household Income Kansas City Metropolitan Area**

### Disabled Population (%)



Data source: U.S. Census Bureau, American Community Survey 2017 5-year tract data.

Source: MARC Research Services Department

**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.

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<sup>i</sup> National Drought Mitigation Center, U.S. Drought Monitor Website, <http://droughtmonitor.unl.edu/>

<sup>ii</sup> Missouri Department of Natural Resources (MDNR) Missouri Drought Plan, 2002 page 7

<sup>iii</sup> United States Drought Monitor, Map Archive, <https://droughtmonitor.unl.edu/Maps/MapArchive.aspx>

<sup>iv</sup> [https://www.stltoday.com/news/local/govt-and-politics/from-drinking-water-to-farms-drought-s-effect-creeping-across/article\\_35440d14-a1c4-5f86-ac64-b5b63906fe57.html](https://www.stltoday.com/news/local/govt-and-politics/from-drinking-water-to-farms-drought-s-effect-creeping-across/article_35440d14-a1c4-5f86-ac64-b5b63906fe57.html) <https://www.foxnews.com/us/drought-takes-toll-on-missouri-farmers-crops-cattle> <https://www.missouriruralist.com/weather/cattlemen-turns-baling-corn-drought> <https://www.missouriruralist.com/conservation/3-conservation-restrictions-lifted-during-drought>

<sup>v</sup> Drought of 2012 Final Report, MDNR Online, <http://dnr.mo.gov/pubs/docs/THeDroughtOf2012.pdf>

<sup>vi</sup> Drought of 2012 Final Report, MDNR Online, <http://dnr.mo.gov/pubs/docs/THeDroughtOf2012.pdf>

<sup>vii</sup> Drought of 2012 Final Report, MDNR Online, <http://dnr.mo.gov/pubs/docs/THeDroughtOf2012.pdf>

<sup>viii</sup> National Drought Mitigation Center

<sup>ix</sup> National Drought Mitigation Center Website, Drought Impact Reporter Help Page

<sup>x</sup> National Drought Mitigation Center Website

<sup>xi</sup> National Drought Mitigation Center Website

<sup>xii</sup> United States Drought Monitor, Data Download, Comprehensive Statistics, <https://droughtmonitor.unl.edu/Data/DataDownload.aspx>

<sup>xiii</sup> United States Drought Monitor

<sup>xiv</sup> SEMA Hazard Mitigation Plan, pg. 3.252

<sup>xv</sup> Department of Homeland Security, Office of Cyber Infrastructure and Analysis, "Drought Impacts to Critical Infrastructure," April 23, 2015

<sup>xvi</sup> Nation Master Website, [www.nationmaster.com](http://www.nationmaster.com)

<sup>xvii</sup> National Oceanic and Atmospheric Administration, Storm Events Database

<sup>xviii</sup> National Weather Service, Website, <http://www.nws.noaa.gov/os/heat>

<sup>xix</sup> Nation Master Website, [www.nationmaster.com](http://www.nationmaster.com)

<sup>xx</sup> [National Weather Service, Website, <http://www.nws.noaa.gov/os/heat/ww.shtml>]

<sup>xxi</sup> High Plains Regional Climate Center, Website, <http://www.hprcc.unl.edu/>

<sup>xxii</sup> High Plains Regional Climate Center, Website, <http://www.hprcc.unl.edu/>

<sup>xxiii</sup> National Weather Service, Website, <http://www.nws.noaa.gov/os/heat>

<sup>xxiv</sup> National Weather Service, Website

<sup>xxv</sup> The Balance, *Federal Poverty Level Guidelines and Chart*, <https://www.thebalance.com/federal-poverty-level-definition-guidelines-chart-3305843>

Understanding Long-Term Climate Change for Kansas City, Missouri. Report by Dan Walker, Ph.D. A.M. ASCE, Climate Moneys LLC, and Christopher Anderson, Ph.D., Iowa State University, [www.climatelook.com](http://www.climatelook.com)

#### **4.14 Attachments**

**Attachment 1:** Summary Assessment of Risks (Cass, Clay, Jackson, Platte and Ray Counties)



## ATTACHMENT 1

### SUMMARY ASSESSMENT OF RISKS CASS, CLAY, JACKSON, PLATTE AND RAY COUNTIES



The following information provides a summary of risks that each county, city, school district, and other special district participating in the 2020 plan faces from the five priority hazards – tornadoes, floods (including dam and levee failures), severe winter weather, heat and drought, and severe thunderstorms.

A number of local jurisdictions serve areas in more than one county (e.g., Kansas City, Missouri). In those cases, all of the jurisdiction's data is included in one summary profile in the county where the major portion of that local jurisdiction is found.

The information comes from MARC databases and FEMA databases.

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## CASS COUNTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	41,414
Number of Schools	47
Number of Nursing Homes	10
Number of Childcare Centers	49
Number of Apartment Complexes	51
Number of Hazardous Materials locations	110
Tornado events in past 5 years (NOAA)	4

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	74
---	----

### Floods

---

Buildings in floodplain	885
Commercial property in floodplain (parcels)	79
Commercial property in floodplain (area)	326.9 Acres
Residential property in floodplain (parcels)	1,224
Residential property in floodplain (value)	\$121,810,450
Residential property in floodplain (area)	26562.9 Acres
Hazardous materials locations in floodplain	3
Dams	69
Flood events in past 5 years (NOAA)	14

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF BELTON SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	9,611
Number of Schools	10
Number of Nursing Homes	4
Number of Childcare Centers	14
Number of Apartment Complexes	19
Number of Hazardous Materials locations	20
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	2
---	---

### Floods

---

Buildings in floodplain	155
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	1.9 Acres
Residential property in floodplain (parcels)	63
Residential property in floodplain (value)	\$3,879,890
Residential property in floodplain (area)	83.4 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF HARRISONVILLE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	3,940
Number of Schools	8
Number of Nursing Homes	4
Number of Childcare Centers	8
Number of Apartment Complexes	10
Number of Hazardous Materials locations	17
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	8
---	---

### Floods

---

Buildings in floodplain	85
Commercial property in floodplain (parcels)	13
Commercial property in floodplain (area)	25.0 Acres
Residential property in floodplain (parcels)	71
Residential property in floodplain (value)	\$4,077,910
Residential property in floodplain (area)	226.2 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF LAKE ANNETTE SUMMARY ASSESSMENT OF RISKS

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	0
---	---

### Floods

---

Buildings in Floodplain	22
Commercial Properties in Floodplain	0
Commercial Area in Floodplain	Unknown
Residential Properties in Floodplain	35
Residential Value in Floodplain	\$527,260
Residential Area in Floodplain	7.0 Acres
Hazardous Materials 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)	0

### Heat

---

Cooling Centers	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Material Locations	0
Heat related events in past 5 years (NOAA)	0

## CITY OF LAKE WINNEBAGO SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	526
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	6
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	1.1 Acres
Residential property in floodplain (parcels)	3
Residential property in floodplain (value)	\$501,970
Residential property in floodplain (area)	1.1 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	0

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF PECULIAR SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	2,142
Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	3
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)	2
---	---

### Floods

---

Buildings in floodplain	43
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	1.8 Acres
Residential property in floodplain (parcels)	51
Residential property in floodplain (value)	\$5,051,870
Residential property in floodplain (area)	128.7 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF PLEASANT HILL SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	3,003
Number of Schools	5
Number of Nursing Homes	0
Number of Childcare Centers	4
Number of Apartment Complexes	6
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	10
---	----

### Floods

---

Buildings in floodplain	113
Commercial property in floodplain (parcels)	46
Commercial property in floodplain (area)	61.8 Acres
Residential property in floodplain (parcels)	116
Residential property in floodplain (value)	\$8,541,470
Residential property in floodplain (area)	165.6 Acres
Hazardous materials locations in floodplain	1
Dams	2
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0



## CITY OF RAYMORE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	8,239
Number of Schools	7
Number of Nursing Homes	2
Number of Childcare Centers	14
Number of Apartment Complexes	10
Number of Hazardous Materials locations	7
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	6
---	---

### Floods

---

Buildings in floodplain	41
Commercial property in floodplain (parcels)	4
Commercial property in floodplain (area)	10.2 Acres
Residential property in floodplain (parcels)	44
Residential property in floodplain (value)	\$7,782,270
Residential property in floodplain (area)	582.6 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	0

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## ARCHIE R-V SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	2
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	1
Number of Hazardous Materials locations	2
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	9
---	---

### Floods

---

Buildings in floodplain	54
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	2.8 Acres
Residential property in floodplain (value)	\$9,119,560
Residential property in floodplain (area)	4882.3 Acres
Hazardous materials locations in floodplain	0
Dams	5
Flood events in past 5 years (NOAA)	0

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## HARRISONVILLE SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	8
Number of Nursing Homes	4
Number of Childcare Centers	8
Number of Apartment Complexes	10
Number of Hazardous Materials locations	30
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	12
---	----

### Floods

---

Buildings in floodplain	143
Commercial property in floodplain (parcels)	15
Commercial property in floodplain (area)	44.4 Acres
Residential property in floodplain (value)	\$15,911,570
Residential property in floodplain (area)	3942.0 Acres
Hazardous materials locations in floodplain	0
Dams	11
Flood events in past 5 years (NOAA)	3

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## PLEASANT HILL R-III SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	5
Number of Nursing Homes	0
Number of Childcare Centers	4
Number of Apartment Complexes	5
Number of Hazardous Materials locations	15
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	13
---	----

### Floods

---

Buildings in floodplain	161
Commercial property in floodplain (parcels)	47
Commercial property in floodplain (area)	65.8 Acres
Residential property in floodplain (value)	\$16,304,040
Residential property in floodplain (area)	2659.1 Acres
Hazardous materials locations in floodplain	1
Dams	15
Flood events in past 5 years (NOAA)	7

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## RAYMORE-PECULIAR SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	12
Number of Nursing Homes	2
Number of Childcare Centers	18
Number of Apartment Complexes	14
Number of Hazardous Materials locations	23
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	9
---	---

### Floods

---

Buildings in floodplain	159
Commercial property in floodplain (parcels)	6
Commercial property in floodplain (area)	13.6 Acres
Residential property in floodplain (value)	\$36,047,600
Residential property in floodplain (area)	2526.9 Acres
Hazardous materials locations in floodplain	1
Dams	9
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CLAY COUNTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	96,935
Number of Schools	84
Number of Nursing Homes	21
Number of Childcare Centers	92
Number of Apartment Complexes	192
Number of Hazardous Materials locations	213
Tornado events in past 5 years (NOAA)	4

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	109
---	-----

### Floods

---

Buildings in floodplain	4,836
Commercial property in floodplain (parcels)	1,001
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	2,223
Residential property in floodplain (value)	\$288,541,100
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	73
Dams	41
Flood events in past 5 years (NOAA)	38

### Severe Winter Weather

---

Warming Centers	11
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	11
Heat related events in past 5 years (NOAA)	0

## CITY OF EXCELSIOR SPRINGS SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	4,921
Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	13
Number of Hazardous Materials locations	11
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	4
---	---

### Floods

---

Buildings in floodplain	59
Commercial property in floodplain (parcels)	20
Commercial property in floodplain (area)	4.2 Acres
Residential property in floodplain (parcels)	26
Residential property in floodplain (value)	\$1,907,000
Residential property in floodplain (area)	0.0 Acres
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	1
Heat related events in past 5 years (NOAA)	0

## CITY OF GLADSTONE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	12,109
Number of Schools	7
Number of Nursing Homes	2
Number of Childcare Centers	11
Number of Apartment Complexes	27
Number of Hazardous Materials locations	9
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	12
---	----

### Floods

---

Buildings in floodplain	102
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	80
Residential property in floodplain (value)	\$11,187,000
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0



## CITY OF KEARNEY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	3,595
Number of Schools	8
Number of Nursing Homes	0
Number of Childcare Centers	6
Number of Apartment Complexes	6
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	141
Commercial property in floodplain (parcels)	14
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	40
Residential property in floodplain (value)	\$9,126,700
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	3
Dams	0
Flood events in past 5 years (NOAA)	3

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF LAWSON SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	986
Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	2
Number of Apartment Complexes	1
Number of Hazardous Materials locations	4
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	1
---	---

### Floods

---

Buildings in floodplain	14
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	1.0 Acres
Residential property in floodplain (parcels)	3
Residential property in floodplain (value)	\$329,190
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF LIBERTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	11,782
Number of Schools	17
Number of Nursing Homes	5
Number of Childcare Centers	13
Number of Apartment Complexes	26
Number of Hazardous Materials locations	23
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	16
---	----

### Floods

---

Buildings in floodplain	390
Commercial property in floodplain (parcels)	48
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	237
Residential property in floodplain (value)	\$29,285,900
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	1
Dams	8
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	2
Heat related events in past 5 years (NOAA)	0

## CITY OF MOSBY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	103
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Materials locations	3
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	0
---	---

### Floods

---

Buildings in floodplain	134
Commercial property in floodplain (parcels)	11
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	86
Residential property in floodplain (value)	\$3,855,100
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	2
Dams	0
Flood events in past 5 years (NOAA)	3

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF NORTH KANSAS CITY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	2,657
Number of Schools	1
Number of Nursing Homes	2
Number of Childcare Centers	3
Number of Apartment Complexes	22
Number of Hazardous Materials locations	50
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	6
---	---

### Floods

---

Buildings in floodplain	1,823
Commercial property in floodplain (parcels)	653
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	972
Residential property in floodplain (value)	\$134,263,800
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	47
Dams	0
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF SMITHVILLE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	3,677
Number of Schools	5
Number of Nursing Homes	1
Number of Childcare Centers	6
Number of Apartment Complexes	6
Number of Hazardous Materials locations	5
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	7
---	---

### Floods

---

Buildings in floodplain	196
Commercial property in floodplain (parcels)	62
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	92
Residential property in floodplain (value)	\$12,344,100
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	1
Dams	6
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## FISHING RIVER FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	1
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	0
Number of Hazardous Materials locations	4
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	4
---	---

### Floods

---

Buildings in floodplain	436
Commercial property in floodplain (parcels)	42
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	189
Residential property in floodplain (value)	\$13,318,700
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	2
Dams	3
Flood events in past 5 years (NOAA)	7

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## EXCELSIOR SPRINGS SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	8
---	---

### Floods

---

Buildings in Floodplain	444
Commercial Properties in Floodplain	36
Residential Properties in Floodplain	230
Residential Value in Floodplain	\$16,684,050
Hazardous Materials in Floodplain	2
Dams	2
Flood events in past 5 years (NOAA)	12

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	13
Number of Hazardous Material Locations	0
Number of Hazardous Material Locations	0
Heat related events in past 5 years (NOAA)	0
Heat related events in past 5 years (NOAA)	0



## LAWSON SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	2
Number of Apartment Complexes	1
Number of Hazardous Materials locations	1
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	3
---	---

### Floods

---

Buildings in floodplain	45
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	13
Residential property in floodplain (value)	\$1,260,490
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## NORTH KANSAS CITY SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	43
Number of Nursing Homes	8
Number of Childcare Centers	54
Number of Apartment Complexes	125
Number of Hazardous Materials locations	127
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	52
---	----

### Floods

---

Buildings in floodplain	3,284
Commercial property in floodplain (parcels)	813
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$183,771,200
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	65
Dams	4
Flood events in past 5 years (NOAA)	14

### Severe Winter Weather

---

Warming Centers	5
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	5
Heat related events in past 5 years (NOAA)	0

## SMITHVILLE R-II SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	5
Number of Nursing Homes	1
Number of Childcare Centers	6
Number of Apartment Complexes	6
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	15
---	----

### Floods

---

Buildings in floodplain	238
Commercial property in floodplain (parcels)	63
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$18,184,079
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	1
Dams	12
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## JACKSON COUNTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	320,515
Number of Schools	276
Number of Nursing Homes	85
Number of Childcare Centers	331
Number of Apartment Complexes	1,727
Number of Hazardous Materials locations	584
Tornado events in past 5 years (NOAA)	10

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	175
---	-----

### Floods

---

Buildings in floodplain	8,285
Commercial property in floodplain (parcels)	1,447
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	2,948
Residential property in floodplain (value)	\$4,373,737,642
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	123
Dams	79
Flood events in past 5 years (NOAA)	63

### Severe Winter Weather

---

Warming Centers	41
Severe winter weather in past 5 years (NOAA)	1

### Heat

---

Cooling Centers	41
Heat related events in past 5 years (NOAA)	0

## CITY OF BLUE SPRINGS SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	20,591
Number of Schools	20
Number of Nursing Homes	7
Number of Childcare Centers	24
Number of Apartment Complexes	37
Number of Hazardous Materials locations	27
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	15
---	----

### Floods

---

Buildings in floodplain	38
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	24
Residential property in floodplain (value)	\$4,344,048
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	3
Heat related events in past 5 years (NOAA)	0

## CITY OF GRANDVIEW SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	10,941
Number of Schools	9
Number of Nursing Homes	2
Number of Childcare Centers	14
Number of Apartment Complexes	43
Number of Hazardous Materials locations	18
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	3
---	---

### Floods

---

Buildings in floodplain	101
Commercial property in floodplain (parcels)	3
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	31
Residential property in floodplain (value)	\$2,943,816
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF GREENWOOD SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	2,128
Number of Schools	1
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	0
Number of Hazardous Materials locations	3
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)	Unknown
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	1
Residential property in floodplain (value)	\$84,132
Residential property in floodplain (area)	Unknown
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF INDEPENDENCE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	53,841
Number of Schools	38
Number of Nursing Homes	9
Number of Childcare Centers	41
Number of Apartment Complexes	104
Number of Hazardous Materials locations	78
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	43
---	----

### Floods

---

Buildings in floodplain	1,609
Commercial property in floodplain (parcels)	80
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	730
Residential property in floodplain (value)	\$105,142,309
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	3
Dams	4
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	7
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	6
Heat related events in past 5 years (NOAA)	0



## CITY OF KANSAS CITY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	230,335
Number of Schools	193
Number of Nursing Homes	72
Number of Childcare Centers	231
Number of Apartment Complexes	1,524
Number of Hazardous Materials locations	451
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	124
---	-----

### Floods

---

Buildings in floodplain	6,408
Commercial property in floodplain (parcels)	1,439
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	1,658
Residential property in floodplain (value)	\$4,182,902,712
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	121
Dams	32
Flood events in past 5 years (NOAA)	66

### Severe Winter Weather

---

Warming Centers	26
Severe winter weather in past 5 years (NOAA)	1

### Heat

---

Cooling Centers	27
Heat related events in past 5 years (NOAA)	0

## CITY OF LEE'S SUMMIT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	38,073
Number of Schools	27
Number of Nursing Homes	11
Number of Childcare Centers	43
Number of Apartment Complexes	77
Number of Hazardous Materials locations	59
Tornado events in past 5 years (NOAA)	3

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	24
---	----

### Floods

---

Buildings in floodplain	386
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	398
Residential property in floodplain (value)	\$69,966,440
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	2
Dams	14
Flood events in past 5 years (NOAA)	5

### Severe Winter Weather

---

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	2
Heat related events in past 5 years (NOAA)	0

## CITY OF OAK GROVE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	3,007
Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	5
Number of Apartment Complexes	9
Number of Hazardous Materials locations	11
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	4
---	---

### Floods

---

Buildings in floodplain	4
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	1
Residential property in floodplain (value)	\$148,222
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF RAYTOWN SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	13,276
Number of Schools	13
Number of Nursing Homes	4
Number of Childcare Centers	13
Number of Apartment Complexes	36
Number of Hazardous Materials locations	12
Tornado events in past 5 years (NOAA)	2

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	3
---	---

### Floods

---

Buildings in floodplain	25
Commercial property in floodplain (parcels)	11
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	16
Residential property in floodplain (value)	\$1,867,390
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	1
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	1
Heat related events in past 5 years (NOAA)	0

## CENTRAL JACKSON COUNTY FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	26
Number of Nursing Homes	7
Number of Childcare Centers	33
Number of Apartment Complexes	44
Number of Hazardous Material Locations	1
Number of Hazardous Material Locations	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	18
---	----

### Floods

---

Buildings in Floodplain	245
Commercial Properties in Floodplain	17
Commercial Area in Floodplain	69.0 Acres
Residential Properties in Floodplain	103
Residential Value in Floodplain	\$13,917,918
Residential Area in Floodplain	69.0 Acres
Hazardous Materials in Floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	3

### Severe Winter Weather

---

Warming Centers	4
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	4
Heat related events in past 5 years (NOAA)	0

## SNI-VALLEY FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	5
Number of Apartment Complexes	9
Number of Hazardous Materials locations	11
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	6
---	---

### Floods

---

Buildings in floodplain	52
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	29
Residential property in floodplain (value)	\$3,696,843
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## BLUE SPRINGS SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	27
Number of Nursing Homes	9
Number of Childcare Centers	41
Number of Apartment Complexes	52
Number of Hazardous Materials locations	43
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	24
---	----

### Floods

---

Buildings in floodplain	575
Commercial property in floodplain (parcels)	36
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$90,217,639
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	3
Dams	12
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	3
Heat related events in past 5 years (NOAA)	0

## FORT OSAGE R-I SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	12
Number of Nursing Homes	0
Number of Childcare Centers	5
Number of Apartment Complexes	7
Number of Hazardous Materials locations	38
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	14
---	----

### Floods

---

Buildings in floodplain	629
Commercial property in floodplain (parcels)	49
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$12,553,760
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	10
Dams	10
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	1
Heat related events in past 5 years (NOAA)	0



## GRAIN VALLEY SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	8
Number of Nursing Homes	0
Number of Childcare Centers	7
Number of Apartment Complexes	11
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	145
Commercial property in floodplain (parcels)	18
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$8,505,292
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## INDEPENDENCE SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	36
Number of Nursing Homes	8
Number of Childcare Centers	33
Number of Apartment Complexes	99
Number of Hazardous Materials locations	64
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	34
---	----

### Floods

---

Buildings in floodplain	1,462
Commercial property in floodplain (parcels)	54
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$65,696,661
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	5
Dams	1
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	9
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	8
Heat related events in past 5 years (NOAA)	0

## KANSAS CITY SCHOOL DISTRICT #33 SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	91
Number of Nursing Homes	37
Number of Childcare Centers	115
Number of Apartment Complexes	1,299
Number of Hazardous Materials locations	236
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	39
---	----

### Floods

---

Buildings in floodplain	3,660
Commercial property in floodplain (parcels)	1,099
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$24,110,075
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	90
Dams	2
Flood events in past 5 years (NOAA)	39

### Severe Winter Weather

---

Warming Centers	17
Severe winter weather in past 5 years (NOAA)	1

### Heat

---

Cooling Centers	18
Heat related events in past 5 years (NOAA)	0

## LEE'S SUMMIT SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	30
Number of Nursing Homes	11
Number of Childcare Centers	36
Number of Apartment Complexes	75
Number of Hazardous Materials locations	63
Tornado events in past 5 years (NOAA)	6

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	32
---	----

### Floods

---

Buildings in floodplain	337
Commercial property in floodplain (parcels)	14
Commercial property in floodplain (area)	1.1 Acres
Residential property in floodplain (value)	\$42,157,249
Residential property in floodplain (area)	0.5 Acres
Hazardous materials locations in floodplain	1
Dams	26
Flood events in past 5 years (NOAA)	5

### Severe Winter Weather

---

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	2
Heat related events in past 5 years (NOAA)	0

---

## OAK GROVE R-VI SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	5
Number of Apartment Complexes	9
Number of Hazardous Materials locations	11
Tornado events in past 5 years (NOAA)	1

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	5
---	---

### Floods

---

Buildings in floodplain	34
Commercial property in floodplain (parcels)	1
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$2,343,527
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	1
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## METROPOLITAN COMMUNITY COLLEGE DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	6
Number of Nursing Homes	1
Number of Childcare Centers	5
Number of Apartment Complexes	18
Number of Hazardous Material Locations	0
Number of Hazardous Material Locations	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	2
---	---

### Floods

---

Buildings in Floodplain	71
Commercial Properties in Floodplain	54
Commercial Area in Floodplain	245.0 Acres
Residential Properties in Floodplain	2
Residential Value in Floodplain	\$202,500
Residential Area in Floodplain	0.0 Acres
Hazardous Materials in Floodplain	10
Dams	0
Flood events in past 5 years (NOAA)	1

### Severe Winter Weather

---

Warming Centers	0
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## PLATTE COUNTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	41,301
Number of Schools	37
Number of Nursing Homes	12
Number of Childcare Centers	29
Number of Apartment Complexes	101
Number of Hazardous Materials locations	116
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	94
---	----

### Floods

---

Buildings in floodplain	1,251
Commercial property in floodplain (parcels)	549
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	457
Residential property in floodplain (value)	\$10,201,460
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	28
Dams	29
Flood events in past 5 years (NOAA)	25

### Severe Winter Weather

---

Warming Centers	10
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	8
Heat related events in past 5 years (NOAA)	0

## CITY OF DEARBORN SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	3
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	1
Number of Hazardous Material Locations	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	3
---	---

### Floods

---

Buildings in Floodplain	10
Commercial Properties in Floodplain	14
Commercial Area in Floodplain	Unknown
Residential Properties in Floodplain	2
Residential Value in Floodplain	\$14,385
Residential Area in Floodplain	Unknown
Hazardous Materials 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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0



## CITY OF FARLEY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	107
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	9
Commercial property in floodplain (parcels)	4
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	2
Residential property in floodplain (value)	\$26,960
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF FERRELVIEW SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	274
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	3
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	5
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$342,000
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF HOUSTON LAKE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	167
Number of Residential Units in City	
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	6
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF LAKE WAUKOMIS SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	429
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	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF NORTHMOOR SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	163
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	47
Commercial property in floodplain (parcels)	6
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	6
Residential property in floodplain (value)	\$158,140
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF PARKVILLE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	2,527
Number of Schools	1
Number of Nursing Homes	1
Number of Childcare Centers	1
Number of Apartment Complexes	6
Number of Hazardous Materials locations	5
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	17
---	----

### Floods

---

Buildings in floodplain	63
Commercial property in floodplain (parcels)	52
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	4
Residential property in floodplain (value)	\$273,029
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	3
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF PLATTE CITY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	1,975
Number of Schools	5
Number of Nursing Homes	1
Number of Childcare Centers	4
Number of Apartment Complexes	16
Number of Hazardous Materials locations	6
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)	8
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	0

### Severe Winter Weather

---

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	2
Heat related events in past 5 years (NOAA)	0

## CITY OF PLATTE WOODS SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	190
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)	0
---	---

### Floods

---

Buildings in floodplain	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0



## CITY OF RIVERSIDE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	1,533
Number of Schools	1
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	28
Number of Hazardous Materials locations	20
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	5
---	---

### Floods

---

Buildings in floodplain	147
Commercial property in floodplain (parcels)	145
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	18
Residential property in floodplain (value)	\$278,555
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	18
Dams	0
Flood events in past 5 years (NOAA)	5

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF TRACY

### SUMMARY ASSESSMENT OF RISKS

#### Tornadoes

---

Number of Housing Units	96
Number of Schools	0
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	0
Number of Hazardous Materials locations	1
Tornado events in past 5 years (NOAA)	0

#### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	0
---	---

#### Floods

---

Buildings in floodplain	6
Commercial property in floodplain (parcels)	23
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$38,660
Residential property in floodplain (area)	0.0 Acres
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)	0

#### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF WEATHERBY LAKE SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	847
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)	7
---	---

### Floods

---

Buildings in floodplain	4
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## CITY OF WESTON SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Housing Units	800
Number of Schools	2
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	2
Number of Hazardous Materials locations	3
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	3
---	---

### Floods

---

Buildings in floodplain	36
Commercial property in floodplain (parcels)	24
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	31
Residential property in floodplain (value)	\$565,165
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	0
Dams	0
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## NORTHLAND REGIONAL AMBULANCE DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

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	0
Commercial property in floodplain (parcels)	0
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	0
Residential property in floodplain (value)	Unknown
Residential property in floodplain (area)	0.0 Acres
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)	0

### Heat

---

Cooling Centers	0
Heat related events in past 5 years (NOAA)	0

## WEST PLATTE FIRE PROTECTION DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	2
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	2
Number of Hazardous Materials locations	5
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	5
---	---

### Floods

---

Buildings in floodplain	78
Commercial property in floodplain (parcels)	60
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	52
Residential property in floodplain (value)	\$931,520
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	1
Dams	3
Flood events in past 5 years (NOAA)	2

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## NORTH PLATTE R-I SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	5
Number of Nursing Homes	0
Number of Childcare Centers	2
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)	7
---	---

### Floods

---

Buildings in floodplain	53
Commercial property in floodplain (parcels)	40
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$1,203,398
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	3
Dams	2
Flood events in past 5 years (NOAA)	3

### Severe Winter Weather

---

Warming Centers	3
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## PARK HILL SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	22
Number of Nursing Homes	7
Number of Childcare Centers	18
Number of Apartment Complexes	71
Number of Hazardous Materials locations	71
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	54
---	----

### Floods

---

Buildings in floodplain	699
Commercial property in floodplain (parcels)	260
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$5,150,111
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	18
Dams	16
Flood events in past 5 years (NOAA)	12

### Severe Winter Weather

---

Warming Centers	4
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	4
Heat related events in past 5 years (NOAA)	0



## PLATTE COUNTY R-III SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	8
Number of Nursing Homes	7
Number of Childcare Centers	9
Number of Apartment Complexes	35
Number of Hazardous Materials locations	31
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	29
---	----

### Floods

---

Buildings in floodplain	65
Commercial property in floodplain (parcels)	43
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$1,502,109
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	2
Dams	7
Flood events in past 5 years (NOAA)	4

### Severe Winter Weather

---

Warming Centers	2
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	2
Heat related events in past 5 years (NOAA)	0

---

## WEST PLATTE R-II SCHOOL DISTRICT SUMMARY ASSESSMENT OF RISKS

### Tornadoes

---

Number of Schools	2
Number of Nursing Homes	0
Number of Childcare Centers	1
Number of Apartment Complexes	2
Number of Hazardous Materials locations	9
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	5
---	---

### Floods

---

Buildings in floodplain	439
Commercial property in floodplain (parcels)	206
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (value)	\$2,206,981
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	5
Dams	4
Flood events in past 5 years (NOAA)	5

### Severe Winter Weather

---

Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

---

Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## PARK UNIVERSITY SUMMARY ASSESSMENT OF RISKS

---

### Severe Thunderstorm

---

Severe thunderstorms in past 5 years (NOAA)	0
---	---

### Floods

---

Buildings in Floodplain	7
Commercial Properties in Floodplain	4
Commercial Area in Floodplain	24.0 Acres
Residential Properties in Floodplain	0
Residential Value in Floodplain	Unknown
Residential Area in Floodplain	Unknown
Hazardous Materials 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)	0

### Heat

---

Cooling Centers	0
Number of Nursing Homes	0
Number of Childcare Centers	0
Number of Apartment Complexes	0
Number of Hazardous Material Locations	0
Number of Hazardous Material Locations	0
Heat related events in past 5 years (NOAA)	0
Heat related events in past 5 years (NOAA)	0

## RAY COUNTY SUMMARY ASSESSMENT OF RISKS

### Tornadoes

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Number of Housing Units	10,070
Number of Schools	12
Number of Nursing Homes	0
Number of Childcare Centers	6
Number of Apartment Complexes	9
Number of Hazardous Materials locations	41
Tornado events in past 5 years (NOAA)	5

### Severe Thunderstorm

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Severe thunderstorms in past 5 years (NOAA)	21
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### Floods

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Buildings in floodplain	1,120
Commercial property in floodplain (parcels)	24
Commercial property in floodplain (area)	186.7 Acres
Residential property in floodplain (parcels)	390
Residential property in floodplain (value)	\$19,986,210
Residential property in floodplain (area)	485.4 Acres
Hazardous materials locations in floodplain	5
Dams	49
Flood events in past 5 years (NOAA)	7

### Severe Winter Weather

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Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

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Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## CITY OF RICHMOND SUMMARY ASSESSMENT OF RISKS

### Tornadoes

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Number of Housing Units	2,824
Number of Schools	4
Number of Nursing Homes	0
Number of Childcare Centers	3
Number of Apartment Complexes	7
Number of Hazardous Materials locations	14
Tornado events in past 5 years (NOAA)	0

### Severe Thunderstorm

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Severe thunderstorms in past 5 years (NOAA)	6
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### Floods

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Buildings in floodplain	45
Commercial property in floodplain (parcels)	2
Commercial property in floodplain (area)	1.8 Acres
Residential property in floodplain (parcels)	31
Residential property in floodplain (value)	\$2,203,550
Residential property in floodplain (area)	18.0 Acres
Hazardous materials locations in floodplain	1
Dams	3
Flood events in past 5 years (NOAA)	0

### Severe Winter Weather

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Warming Centers	1
Severe winter weather in past 5 years (NOAA)	0

### Heat

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Cooling Centers	1
Heat related events in past 5 years (NOAA)	0

## **Section 5: Mitigation Strategy**

### **List of Attachments**

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## Section 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 2015 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 8 identified hazards. For continuing participants from the 2015 Plan, each of the jurisdictions' mitigation goals and actions identified in the 2015 Plan were reviewed for relevance and updated with current status. Continuing and new participants are noted within the mitigation strategies section (**Attachment 1**).

These mitigation actions were activities that stakeholders in the hazard mitigation 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.

For the 2015 Plan, 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.

In 2015, the planning team 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. However, the 2020 planning team decided the qualitative ranking scale was not helpful to jurisdictions when making mitigation decisions. The planning team decided to show the individual values for magnitude, impact, and probability of occurrence instead of assigning a qualitative ranking.

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.

### 5.1.1. Changes to 2015 Mitigation Goals and Actions Database for 2020 Plan Update

For this 2020 Plan update, continuing participants used the database created in 2015 to update their goals and actions. The database was modified slightly to collect additional information. Two of the added fields were optional and one was required. The new fields were:

- 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<sup>i</sup> of prioritizing mitigation goals and actions (based on implementation timeframes) used for the 2015 Plan was 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).
- 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.

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, 2015 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.

#### 5.1.1b Cost Estimates for Mitigation Action

In 2015, to estimate the cost of mitigation actions a cost estimation process was used where specific costs weren't known. This same process was used for the 2020 plan. Jurisdictions were encouraged to use a cost estimation range qualifier in accordance with the scale below:

- Low – the action is estimated to cost between \$0 and \$10,000
- Medium – the action is estimated to cost between \$10,001 and \$100,000
- High -- the action is estimated to cost more than \$100,000

Additionally, jurisdictions were asked to consider whether the costs were one-time or recurring.



### 5.1.1c Status of Jurisdictional 2015 Goals and Actions

As noted above, continuing jurisdictions were required to update the status of their goals and actions and make changes as appropriate. Attachment 2 is the consolidated listing of all participating jurisdictions' mitigation goals and actions and reflects the most current status of their goals and actions. Where a jurisdiction marked an action as "completed" or "deleted" from the 2015 Plan, these actions have been removed from the listing. To avoid confusion and for ease of **reference** to the 2015 Plan and Attachment 1, remaining goals and actions were not re-numbered or re-lettered.

### 5.1.2 Updates to School District/College/University 2015 Mitigation Goals and Actions

Those school districts and colleges and universities that participated in the 2015 plan were asked to review their 2015 goals and strategies similarly to cities and counties. For school districts that did not participate in 2015, they were asked to identify goals and strategies for the 2020 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 2020 Plan

Jurisdictions that participated in the 2015 plan were invited to participate in the 2020 plan. In addition, all cities, school districts and public colleges and universities that did not participate in 2015 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 (2015) and new (2020) mitigation goals and actions were consolidated into **Attachment 2**. The column labeled "Plan year" indicates if the goal or action is from the 2015 plan or newly added as part of the 2020 update. New (2020) goals continue to mirror the numbered list from the 2010 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 2020 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**).

Additionally, several goals and actions were identified in the 2010 and 2015 Plans that jurisdictions could adopt in order to meet the deliverables of NFIP compliance and are listed below. These have been grouped below according to NFIP component and are notated by double asterisks (\*\*) within each jurisdiction's mitigation strategy (**Attachment 1**).

New strategies developed for the 2020 Plan which fall into these categories are likewise identified by a double asterisk:

### **1) Floodplain management**

#### Discourage new development in floodplains and flood-prone areas.

- a.) Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.
- b.) Consider using the 500-year floodplain rather than the 100-year floodplain or consider adopting a stream setback ordinance.
- 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.

#### 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).
- 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.
- 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.

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 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

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<sup>i</sup> FEMA *Local Mitigation Planning Handbook*, 6-B, March 2013

<b>Cass County 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
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	Deferred	Not something the county commission is comfortable doing at this time	Local Plans and Regulations	Unspecified					
*Enhance public awareness and education efforts related to flooding.	2020	Ongoing	Work with regional PrepareMetroKC effort	Education and Awareness Programs				county	Low	local
**Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	Public awareness events, brochures , media, severe weather training	Education and Awareness Programs	High	12/1/2018	No/ or low cost to implement and require little staff support.	county	Low	Federal, State and local grants when available
<b>Identify low water crossings in the county that may pose a risk to the driving public and eliminate those hazards.</b>										
Emergency Management will work with public works to identify low water crossings in the county and plan for their elimination.	2020	Ongoing	The Emergency Manager will work with county officials including public works and GIS to begin the identification and planning process.	Structure and Infrastructure Projects	Unspecified	12/31/2021		county emergency management and public works	to be determined	local government staff time
Emergency management working on with other county departments in looking at the purchase of flood gates to protect the public from driving into floodwaters	2020	Ongoing	County Commission shows interest in utilizing HMPG funds to fund this project.	Structure and Infrastructure Projects	Medium	TBD		county emergency management and public works	TBD	Grant funding
<b>Implement or improve flood warning systems.</b>										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing	Use of the county Everbridge alert system to alert the public of severe weather events and use of social media accounts	Education and Awareness Programs	Unspecified	TBD		county public works and public information	TBD	Grant funding
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred	waiting for more complete data	Local Plans and Regulations	Unspecified					
**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	Zoning dept, Assessors office and GIS department are developing this	Local Plans and Regulations	Medium	12/1/2018	Data has multiple uses and can benefit across multiple programs.	county zoning, assessor and GIS departments	Low	Federal, State and local grants when available
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits.</b>										

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
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred	County does not have the money for the match or maintenance	Unspecified	Unspecified					
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing	Zoning Office, through the NFIP regulates new structures	Structure and Infrastructure Projects	High	12/1/2018	Decreases potential damage and reduces out of pocket insurance costs.	county zoning office	Low	Federal, State and local grants when available
**Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing	Working with Zoning and Emergency Management through handouts and public education ie fairs, festivals and social media	Education and Awareness Programs	Medium	12/1/2018	No/ or low cost to implement and require little staff support.	county zoning and emergency management	Low	Federal, State and local grants when available
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	Deferred	Not controlled by county, we will advise and assist when requested	Unspecified	Unspecified					
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	Deferred	Not controlled by county, we will advise and assist when requested	Structure and Infrastructure Projects	Unspecified					
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing	Zoning, codes and Flood Plain manager working with homeowners and SEMA/FEMA to resolve issues	Local Plans and Regulations	High	12/1/2018	Requires cooperation of landowners to implement, but ultimately beneficial.	zoning, codes and floodplain manager	Low	Federal, State and local grants when available
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Deferred	Should be incorporated in the new building code standards	Local Plans and Regulations	Unspecified					
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deferred	Should be incorporated in the new building code standards	Local Plans and Regulations	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										

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
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	No interest in local government doing so at this time	Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Public education via MARC/MEMC, local government and working with facilities that house vulnerable public	Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	county emergency management and public information	\$1,000.00	Local government and any grants available
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds. DELETE GOAL</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Deleted	Should be incorporated in new building code standards	Unspecified	Unspecified					
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deleted	Already incorporated into local building codes	Structure and Infrastructure Projects	Low	Ongoing	Would reduce recovery costs, but would have high initial implementation		Unknown	NA
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deleted	No interest in local government in doing so at this time.	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	Will start looking at sheltering plans for existing county facilities and start to place shelter info placards for them.	Structure and Infrastructure Projects	Unspecified			county public works	low	county
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred	Interest is not there at this time	Unspecified	Unspecified					
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred	No Funding available at this time	Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Public awareness events ie county fair, local festivals, brochures, social media and yearly storm spotter training.	Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	county emergency management		Federal , state and local grants
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing	Public education with MARC and MEMC	Education and Awareness Programs	Unspecified	Ongoing	Low/no cost mechanism to increase public safety.	work with MARC and MEMC		NA

<b>Belton 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	No requirement to retrofit	Unspecified	Medium	Ongoing, unknown	While may increase building costs, will lead to greater occupant safety	building code office	Medium	City
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Completed	Based on IBC	Unspecified	Medium	Ongoing, unknown	While may increase building costs, will lead to greater occupant safety		\$0.00	City
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	Completed	Based on IBC	Unspecified	High	Ongoing, unknown	Low/no cost mechanism to increase public safety.		\$0.00	City
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Completed	IBC requires. Belton has adopted IBC'12	Unspecified	High	Ongoing, unknown	Low/no cost mechanism to increase public safety.		\$0.00	City
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Completed	Community Storm shelter built with Federal funds.	Unspecified	High	Ongoing, unknown	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.		Medium	City
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Promote the BHS shelter, and other community shelters	Unspecified	High	Ongoing, unknown	Low/no cost mechanism to increase public safety.	emergency management	\$0.00	School Dist.
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deferred	Deferred to utilities	Unspecified	Medium	Ongoing, unknown	Initial high costs offset by potential savings in recovery costs.		High	City
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred	Not offered	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										



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
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	Coordinating with MPR for assessment	Unspecified	High	Ongoing, unknown	Low/no cost mechanism to increase public safety.	emergency management and public works	\$0.00	City
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Completed	Policy implementation under way	Unspecified	High	Ongoing, unknown	Low/no cost mechanism to increase public safety.		\$0.00	City
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	Will be based on assessment	Unspecified	High	Ongoing, unknown	Increases safety of existing infrastructure for moderate cost	emergency management and public works	Medium	City
<b>Improve Citizen Tornado Preparedness and Warning.</b>										
Encourage residents to be prepared with "ready in 3 Kits"	2015	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	0	0
Encourage use of map your neighbors program "Block Captains"	2015	Ongoing	Use of Neighborhood watch capt.	Education and Awareness Programs	Medium	Ongoing	Free mechanism to assist in damage assessment and community preparedness	emergency management	0	0
Keep update of city expansion annexes for new siren coverage	2015	Ongoing		Local Plans and Regulations	Medium	Ongoing	Ensures siren coverage areas are up to date at little cost.	emergency management	0	0
Promote participation of community for "Code Red" alerting	2015	Completed	Offered thru Cass Co. ESB	Education and Awareness Programs	High	Ongoing	Free mechanism to alert public of disasters.		0	0
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	We encourage during Community Development, and Belton Emergency Management presentation	Unspecified	Medium	Ongoing, unknown	Low/no cost mechanism to increase public safety.	emergency management	\$0.00	City
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing	None at time	Unspecified	Medium	Ongoing, unknown	Low/no cost mechanism to increase public safety.	emergency management	\$0.00	City
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Completed	Per Code	Unspecified	High	Ongoing	Will provide legal mechanism to enforce floodplain management.		\$0.00	City

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
**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	Completed	Per Code	Unspecified	High	Ongoing	Will provide comprehensive approach to floodplain management.		Low	City
**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	Completed	Per Code	Unspecified	High	Ongoing	Will discourage development in floodplain while generating funds for floodplain management activities.		Low	City
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	when identified, appropriate, and available	Unspecified	High	Ongoing, unknown	Will eliminate or greatly reduce repetitive loss properties.		High	Grants
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	When available	Unspecified	High	Ongoing, unknown	No/ or low cost to implement and require little staff support.		\$0.00	City, via grants
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing	see above	Unspecified	High	Ongoing, unknown	No/ or low cost to implement and require little staff support.		\$0.00	City
**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	We work with FEMA and property owners	Unspecified	High	Ongoing, unknown	No/ or low cost to implement and require little staff support.		\$0.00	City
<b>Implement or improve flood warning systems.</b>										
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	Flood warning system no gauges	Unspecified	Medium	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.		Medium	City
<b>Improve flood hazard assessments and flood mapping.</b>										
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Completed	Work with FEMA	Unspecified	High	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	City

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
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred	Work with FEMA	Unspecified	Unspecified					
<b>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.</b>										
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	Currently required by Code	Unspecified	High	Ongoing, unknown	Will prevent flooding for moderate costs	public works	\$0.00	Grants
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	As identified, and funding is available	Unspecified	High	Ongoing, unknown	No/ or low cost to implement and require little staff support.	public works	\$0.00	Grants
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	Required during development process	Unspecified	High	Ongoing, unknown	Will reduce floodplain vulnerability and increase city greenspace.	public works	Medium	Grants
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	As identified, and funding is available	Unspecified	Medium	Ongoing, unknown	Will reduce floodplain vulnerability and increase city greenspace.	public works	Medium	Grants
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing	Work with property owners to identify opportunities	Unspecified	Medium	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	emergency management	\$0.00	Grants
<b>Severe Thunderstorms</b>										
<b>Increase storm warning and forecasting collaboration between city agencies.</b>										
Work with PW on comparing information on incoming weather events	2015	Completed	Weather events are monitored and shared with all city departments	Structure and Infrastructure Projects	High	Ongoing	Potential damage areas requiring public works support will be known before disasters, reducing response times and speeding recovery.		0	0

<b>Harrisonville 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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 - 2030	Planning Stage	Work within the parameters of adopted building codes regarding hazardous area glazing and newer proposed code requirements based on wind speed design for tornado prone areas(ie: ICC-600 expanded and new areas).	Future adoption of most current ICC code cycles. Increase public awareness of building materials options and work with material suppliers to enable availability.	Medium	2025-2030	High costs/High benefit	building code office	Public =over \$500,000 Private= over \$1,000,000	City, private property owners and developers and federal assistance
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2020-2025	Ongoing	The City of Harrisonville will encourage new businesses,schools, etc to construct shelters for their employees and residents	Code and Ordinance adoption. Education	High	2025	Medium costs/high benefit	building code office	\$15,000	City and federal assistance
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2020-2030	Deferred	Due to City budget constraints incentives offered by the City will be unknown	Lobby for increased availability of federal funding	High	Unknown	Unknown costs/high benefit		Unknown	Federal assistance
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2025	Ongoing		Unspecified	Unspecified			emergency management	Low	local govt
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing	Have adopted 3 shelter locations and it works to make them visible on Google Maps and GPS	Hazard Control	Medium	Ongoing	Low/no cost mechanism to increase public safety.	public works	1000	operating funds
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing	Encouraging new policies for construction of safe room and shelters in new public facilities	Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	building code office	1000	operating funds
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	Ongoing	Ongoing issue to ensure that in place public facilities have adequate sheltering for the public and its residents.	Unspecified	Unspecified			public works	High	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
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2020-2025	Ongoing	Ongoing to distribute the information to public buildings and residential	Unspecified	Medium	Ongoing	increase in safe rooms in community	emergency management	1000	operating funds
Partner w/ trade orgs. to conduct safe room workshops.	2020	Ongoing	Working on some sort of partnership with a safe room company to conduct safe room workshops.	Unspecified	Medium	Ongoing	increase in safe rooms in community	emergency management	1000	operating funds
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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	Ongoing	<i>City of Harrisonville does not allow developments in the floodplain. All developments or substantial redevelopments must be elevated above the floodplain</i>	Unspecified	Medium	Ongoing	NA	public works; floodplain manager	NA	NA
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2020	Ongoing	Provide public education materials from FEMA at public events and the city hall codes office kiosk. Provide NFIP local contact information to residents.	Floodplain Management - Improve Compliance with NFIP	High	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	emergency management	Low	Private
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	Provide public education materials from FEMA at public events and the city hall codes office kiosk	Floodplain Management - Beyond Minimum Requirements	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	emergency management	Low	City 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.	2020	Ongoing	Held Flood Mitigation Workshop for residents in 2018 with representatives from SEMA, NFIP, and USACE - Silver Jackets. Another similar event is being planned for 2020	Educate Property Owners about Flood Mitigation Techniques	Medium	2020	Provide guidance to homeowners	emergency management	Low	City general fund
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Will begin this year	The City of Harrisonville uses the FEMA SDE program to estimate and track losses. HMGP funding will be sought to buyout these properties.	Removing Existing Structure from Flood Hazard Areas	High	2025	Will eliminate or greatly reduce repetitive loss properties.	public works; emergency management	\$3,400,000	City of Harrisonville & HMGP



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
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Watershed Evaluations Underway	Based upon recent flood events, the City has identified repetitive flood prone properties: Town Creek - 6 properties; Muddy Creek - 5 properties; Trib #2 - 6 properties. Look for private-public partnering opportunities with regional watershed, based solutions.	Removing Existing Structure from Flood Hazard Areas; Improve Stormwater Drainage System Capacity	High	2030	Will eliminate or greatly reduce repetitive loss properties.	public works; emergency management	\$4,000,000	City, private developers, and HMGP/FMA/PDM
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing	The City of Harrisonville is in the process of implementing sustainable design practices in stormwater management. This process will be better defined as performance data is obtained and evaluated.	Sustainable Planning & Design	Medium	Ongoing	Non-structural solutions such as stream buffers will reduce long-term floodplain impacts	floodplain manager; emergency management	Low	Private and City of Harrisonville
**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	Severe flood events in 2017 and 2019 resulted in numerous homes and businesses flooded. Public meeting events will be held in 2020 to determine public interest in mitigation alternatives.	Removing Existing Structure from Flood Hazard Areas	High	2022	Will eliminate or greatly reduce repetitive loss properties.	floodplain manager; emergency management	Low	City general fund
<b>Implement or improve flood warning systems.</b>										
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	Following the severe flood events of 2017 and 2019, the City has been meeting with the USGS about the installation of stream gauges and flood warning devices	Emergency Preparedness	High	2025	Has the potential to save lives and property	public works; emergency management	\$200,000	City and USGS
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Deferred			Unspecified					
<b>Improve flood hazard assessments and flood mapping.</b>										

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
**Assist FEMA with the Cass County Restudy	2021	Starting	A county-wide restudy by FEMA is getting started with Wood Consulting performing the work. The City attended the scoping meeting and has provided list of data to the SC. The data includes topographic information, watershed characteristics, and USACE models.	Floodplain Management	High	2024	Help guide floodplain management	floodplain manager; emergency management	High	FEMA
**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.	2022	Hold pending completion of the data acquisition	Will proceed upon completion of the data acquisition	Improved Flood Risk Management	Low	2023	Help guide floodplain management	public works; floodplain manager	Low	City of Harrisonville general funds
**Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2021	Hold pending completion of the investigation	Will proceed once the investigation is completed	Improved Flood Risk Management	Low	2022	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning, public works	Low	City of Harrisonville general funds
**Investigate the HAZUS program from FEMA. Download and learn how to operate the program including data acquisition requirements.	2020	Starting	City staff will evaluate this HAZUS program and determine if it should be utilized for further floodplain management	Improved Flood Risk Management	Low	2020	None	planning, public works	Low	City of Harrisonville general funds
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Deferred		Unspecified	Unspecified					
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Deferred		Unspecified	Unspecified					
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred		Unspecified	Unspecified					
<b>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.</b>										

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
Consider & plan alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing	Utilizing the watershed approach and GIS technology, the City of Harrisonville works with homeowners and developers to minimize impacts to the floodplains. Low impact development and utilization of riparian corridors are a priority. With the City's Parks Department, these green spaces are restored or assimilated into sports facilities.	Natural System Protection	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning	Low	City Funds
Identify funding sources for the acquisition & construction of flood-prone land for environmental, recreational and flood mitigation uses.	2021	Starting after alternative planning, watershed and floodplain modeling, and private partnering agreements in place.	The City of Harrisonville has and continues the watershed based evaluation of regional stormwater detention basins. Since 2003 we have constructed one regional basin and prepared concept plans for two more. The City is working with the US Army Corps of Engineers (USACE) on a comprehensive watershed plan for Muddy Creek. Mitigation of flooding is being evaluated; these efforts include regional stormwater detention.	Removing Existing Structure from Flood Hazard Areas; Improve Stormwater Drainage System Capacity	High	Ongoing	Regional detention will protect flood prone properties	planning	\$3,000,000	Public/Private partnering. City funds, private land donations, USACE, and PDM/FMA assistance
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	Public Works and Community Development has worked together on low-impact development to maximize green space and minimize floodplain encroachments. In accordance with our MS4, by 2022, the city will be considering the implementation of riparian corridor protection.	Protect and Restore Natural Flood Mitigation Features	Medium	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning; public works, parks and recreation	Medium	City general funds



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
Design and construct 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.	2021	Concept and modeling completed	With assistance from the US Army Corps of Engineers, a detailed Muddy Creek watershed and floodplain analysis was performed. Regional stormwater detention has been identified as a potential mitigation effort. The City is negotiating with private developers for a private/public partnering.	Construct Flood Control Measures; Improve Stormwater Drainage System Capacity	High	Ongoing	Will prevent flooding for moderate costs	planning; public works, parks and recreation	\$4,000,000	City general funds, fee-in-lieu-of funds, private development, and federal assistance (FMA/PDM)
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	2020	Starting	The City is evaluating the development of a stream team. We are working with the Missouri Department of Conservation and the South Grand River Watershed Alliance to determine the effectiveness and support if this effort is pursued.	Form Partnership to Support Floodplain Management	Medium	Ongoing	NA	planning; public works, parks and recreation	Low	City and private funds
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		Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing	City will continue to participate with the NFIP and assess the ability to work with the CRS program.	Floodplain Management	High	Ongoing	NA	floodplain manager	Low	City general funds
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Will begin this year	Once HMGP funding is secured, City will seek to buyout these floodprone properties.	Removing Existing Structure from Flood Hazard Areas	High	2025	Will eliminate or greatly reduce repetitive loss properties.	floodplain manager, emergency management	\$3,400,000	City of Harrisonville & HMGP
**Elevate low-water crossing structurally failing due to overtopping	2021	Waiting to start	Low water crossing in the City Park that has been damaged from frequent overtopping would be relocated and raised	Infrastructure Protection	Medium	2022	Would help minimize loss to infrastructure	public works	\$150,000	City funds and FMA/PDM assistance

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
**Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2020	Ongoing	The City will provide education materials to guide property owners in flood prone areas.	Elevate or Retrofit Structures and Utilities	Medium	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	emergency management	NA	Private
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2023	Waiting to start	The City will evaluate alternate incentives	Elevate or Retrofit Structures and Utilities	Low	2024	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	floodplain manager, emergency management	NA	City & Private

<b>Lake Annette 2020 Mitigation Strategy (New Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Ensure the community has shelters to accommodate residents and visitors during tornadoes/natural hazards.</b>										
Retrofit or add shelters to existing public/critical facilities.	2020	New	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
<b>Improve tornado warning capabilities.</b>										
Install outdoor warning sirens	2020	New	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
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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	board of aldermen	Low	Local
<b>Implement or improve flood warning systems.</b>										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	New	Explore ordinances and policies that may require attorney and education costs	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	New	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
Increase communication with NWS for timely reporting	2020	New		Local Plans and Regulations	High	1-2 years	Low/no cost mechanism to increase public safety.	board of aldermen	Low	None required
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Part of city operation	board of aldermen	Low	Local

<b>Lake Winnebago 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Deferred		Education and Awareness Programs	Medium		Low/no cost mechanism to increase public safety.		Low	Local
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred								Unknown
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Deferred		Education and Awareness Programs	High		Low/no cost mechanism to increase public safety.		Low	Local
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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					
<b>Improve flood hazard assessments and flood mapping.</b>										
**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	Unknown
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										

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
**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	City
**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	City
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**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	2010	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	board of aldermen	Unknown	property owner

<b>Peculiar 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deferred		Unspecified	Unspecified					
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		No/low cost mechanism to increase public safety.	building official	0	NA
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	High		No/low cost mechanism to increase public safety.	building official	0	NA
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred		Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	High		No/low cost mechanism to increase public safety.	emergency manager	0	NA
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred		Unspecified	Unspecified					
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium		No/low cost mechanism to increase public safety.	emergency manager	0	NA

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
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred		Unspecified	Unspecified					
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
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	free	NA
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Deferred		Unspecified	Unspecified					
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Implement or improve flood warning systems.</b>										
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	Deferred		Unspecified	Unspecified					



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
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Deferred		Unspecified	Unspecified					
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Deferred		Unspecified	Unspecified					
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
**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		Unspecified	Medium	9/1/2016	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning and public works	100000	Public Works, Capital, Water and Wastewater Utility Funds
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Deferred		Unspecified	Unspecified					
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		Unspecified	High	Ongoing	Flooded homes, and new downstream conditions are better than existing conditions.	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		Unspecified	Medium	Unknown	No/low cost mechanism to increase public safety.	planning and public works	Low	Unknown
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					



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
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	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	High	Unknown.	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	Unknown
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Deferred		Unspecified	Unspecified					
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

<b>Pleasant Hill 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred		Unspecified	Unspecified					
Evaluate commercial building code requirements for storm shelters requirements inside commercial and industrial buildings.	2020	New		Unspecified	Unspecified			building code official	low	general fund
If necessary, implement storm shelter requirements for commercial and industrial buildings.	2020	New		Unspecified	Unspecified			building code official	low	general fund
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Unspecified	Unspecified	No set date	Low cost mechanism to increase public safety.	public works	500	General Fund
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Deferred		Unspecified	Unspecified		Lives and property losses avoided			
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.	Unspecified	Unspecified	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Under \$100	General Fund
<b>Ensure all roadways are accessible to emergency service personnel and that at least one route to a destination is accessible without undue delay.</b>										
Assess and if necessary replace Culvert C-12a which crosses 58 Highway near the railroad track wye.	2020	New		Structure and Infrastructure Projects	High			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	New		Structure and Infrastructure Projects	High			public works		Park/Stormwater Sales Tax/General Fund
Assess and if necessary, replace Culvert C-17a which crosses 58 Highway east of 7 Highway	2020	New		Structure and Infrastructure Projects	High			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			public works, planning	low	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
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			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			public works	low	General Fund
<b>Evaluate dams throughout Pleasant Hill to ensure they are structurally sound and do not pose any downstream threats.</b>										
Evaluate City's responsibility and/or regulations which could be put in place for private dam inspections	2020	Ongoing		Local Plans and Regulations	Low			public works, floodplain manager	Low	General Fund
Obtain cost estimate for improvements at City Lake Dam	2020	Ongoing		Structure and Infrastructure Projects	High			public works	Low	General Fund
Select and implement a solution for dam repair at the City Lake	2020	Ongoing		Structure and Infrastructure Projects	Medium			public works	High	Park Fund/General Fund
<b>Examine flood mitigation strategies near downtown Pleasant Hill and along 58 Highway.</b>										
Commission a downtown stormwater study	2020	Ongoing		Local Plans and Regulations	High			public works, planning	medium	Park/Stormwater Sales Tax, General Fund
Obtain cost estimate for downtown stormwater study	2020	Ongoing		Local Plans and Regulations	High			public works, planning	low	General Fund
<b>Examine repetitive flood loss properties. Evaluate feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Low	ongoing	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.	Unspecified	Unspecified	No date set	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		Unspecified	Low	No date set	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		Unspecified	Low	No date set	No/ or low cost to implement and require little staff support.	public works, floodplain manager	100	General Fund
<b>Improve flood hazard assessments and flood mapping.</b>										

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 parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	Medium	ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning, public works	no estimate available	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	Deferred		Unspecified	Unspecified			planning, public works	TBD	General Fund
<b>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.</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.	2010	Ongoing	As the City prepares for a comprehensive plan update, this action will be considered again.	Unspecified	Unspecified			planning, city administration	TBD	General Fund
<b>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.</b>										
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			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			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			emergency management	medium	General Fund
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Deferred		Unspecified	Unspecified					
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Medium	ongoing	Will eliminate or greatly reduce repetitive loss properties.	floodplain manager	Varies	General Fund
**Evaluate the adoption of stream setback ordinances	2020	New		Local Plans and Regulations	Medium			planning, public works	low	General Fund
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					
<b>Heat</b>										
<b>Explore ways to mitigate against extreme heat during outdoor activities.</b>										
Coordinate with the Cass County Library for use as a cooling center when needed	2020	Ongoing		Education and Awareness Programs	Low			emergency management	100	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
Evaluate cooling centers for use at the Cass County Fair.	2020	Ongoing		Structure and Infrastructure Projects	Low			emergency management	100	General Fund
<b>Increase awareness of effects of extreme heat.</b>										
Create a public information campaign regarding the effects of extreme heat on your body and health.	2020	New		Unspecified	Unspecified			emergency management	200	
Create a public information campaign regarding water conservation methods.	2020	New		Unspecified	Unspecified			emergency management	200	Water/Sewer Fund
<b>Severe Thunderstorms</b>										
<b>Continue educational campaigns regarding severe thunderstorms, primarily during outdoor activities.</b>										
Incorporate severe weather public information campaigns to all parents of children enrolled in recreation programs	2020	Ongoing		Education and Awareness Programs	Low			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	New		Unspecified	Unspecified			emergency management	300	Cass County Fair
<b>Ensure warming centers and critical services can continue operations in the event of prolonged power outages.</b>										
Assess availability of fuel resources in the event of power outages.	2020	New		Unspecified	Unspecified			emergency management	low	General Fund
Coordinate with critical facilities to assess back up generation capabilities including how long generators are operable.	2020	New		Unspecified	Unspecified			emergency management	low	General Fund
Evaluate number of emergency generators available for warming centers.	2020	Ongoing		Structure and Infrastructure Projects	Medium			emergency management	100	General Fund
Evaluate the backup generation capacity at each of the Red Cross emergency shelters listed in Pleasant Hill.	2020	New		Unspecified	Unspecified			emergency management		General Fund
Purchase emergency generators for sewer lift stations.	2020	New		Unspecified	Unspecified			public works	600000	Water/Sewer Fund
Purchase generator for emergency warming center (Memorial Building)	2020	New		Unspecified	Unspecified			public works	200000	General Fund
Test the generator for the emergency warming shelter at the Methodist Church.	2020	Ongoing		Structure and Infrastructure Projects	Medium			emergency management	100	General Fund
<b>Reduce the number of trees or tree limbs likely to cause damage during severe winter weather.</b>										
Create a public education campaign regarding tree health and property evaluations.	2020	New		Unspecified	Unspecified			parks and recreation	low	General Fund
Have the City Arborist inventory trees near utility poles.	2020	New		Unspecified	Unspecified			parks and recreation	low	General Fund
<b>Identify nearest emergency shelter for public outdoor facilities.</b>										
Identify shelters for public outdoor facilities.	2020	New		Unspecified	Unspecified			parks and recreation	low	General Fund

<b>Raymore 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	This goal continues to be deferred.	Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	This action is continually promoted through various departments.	Unspecified	Medium	ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Unknown
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Completed	This is completed.	Unspecified	Medium	ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.		Medium	Unknown
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred	Lack of resources continue to make this a deferred resource.	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	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.	Unspecified	Medium	12/1/2017	Low/no cost mechanism to increase public safety.	emergency management	Low	Unknown
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred	This item is still a budgetary constraint at this time.	Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	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.	Unspecified	Medium	ongoing	No/low cost mechanism to increase public safety.	emergency management	Low	Unknown
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										



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
**Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	We also market the NFIP.	Unspecified	Medium	Ongoing (as new homes and businesses continue)	Will reduce recovery costs and ensure compliance with NFIP.	floodplain management	Low	Unknown
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing	We also have city ordinances restricting building in a floodplain.	Unspecified	Low	ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning, public works	Unknown	Unknown
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	We have a designated stormwater plan.	Unspecified	Medium	ongoing	Will prevent flooding for moderate costs	planning, public works	Medium	Unknown
<b>Severe Thunderstorms</b>										
<b>Ensure local alert systems are in place and operational during severe weather.</b>										
Continue to promote the Code Red alert notification system within the City of Raymore and the county	2015	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	0	N/A
Maintain the city's siren system in good working order and continue to assess the coverage those sirens provide	2015	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	0	N/A
<b>Establish a current database of Red Cross certified shelters that could be used during severe weather and make that list available to the public.</b>										
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	0	N/A
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	0	N/A
<b>Increase the public's awareness of the dangers of severe thunderstorms and the need to shelter immediately.</b>										
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	0	N/A

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
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	0	N/A
<b>Promote the advantages of identifying, creating, or building a safe room to be used during severe weather.</b>										
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	0	N/A
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	0	N/A



<b>Clay County 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Work w/ trade orgs to inform builders/ developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/ commercial structures.	2015	Deferred		Education and Awareness Programs	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Low/no cost mechanism to increase public safety.	planning	Low	Unknown
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	planning	Medium	Unknown
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2020	Ongoing		Education and Awareness Programs	High	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Unknown
<b>Ensure Alert, Warning and Mass Notification systems are in place and operational.</b>										
Conduct monthly test of outdoor siren warning system.	2020	Ongoing		Local Plans and Regulations	High	ongoing	Low cost preventative maintenance ensures operational reliability.	emergency management	0	
Continue outdoor siren routine maintenance program	2020	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Low cost preventative maintenance ensures operational reliability.	emergency management	1000	EM budget
Evaluate the need for new storm sirens to ensure that all parts of the county, particularly the unincorporated area where homes are located may be warned during severe weather.	2020	ongoing		Structure and Infrastructure Projects	High	Ongoing		emergency management		FEMA grant and EM budget

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
Encourage use of mass notification systems such as Nixle	2020	Ongoing		Education and Awareness Programs	High	Ongoing	No cost mechanism to increase public alert and warning.	emergency management	0	
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	Unknown
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Low/no cost mechanism to increase public safety.	public works, planning	Low	Unknown
<b>Provide education and awareness.</b>										
Post educational info to media and social media sources	2020	Ongoing		Education and Awareness Programs	High	Ongoing	No cost mechanism to increase public awareness and education.	emergency management	Low	
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2015	Deferred		Unspecified	Unspecified					
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.	2015	Deferred		Unspecified	Unspecified					
Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2015	Deferred		Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2020	Ongoing		Education and Awareness Programs	Low	Ongoing		emergency management, floodplain manager	Low	Unknown

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
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		Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public awareness for floodplain management.	emergency management	Low	county and city government
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Ongoing		Structure and Infrastructure Projects	High	Ongoing	No/ or low cost to implement and require little staff support.	public works, floodplain manager	Low	Unknown
**Review plans and update as needed	2020	Ongoing		Local Plans and Regulations	High	Annual	Low cost mechanism to ensure response plans are in place and feasible.	public works, floodplain manager	0	
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing		Local Plans and Regulations	High	Ongoing	No/ or low cost to implement and require little staff support.	public works, floodplain manager	Low	municipal funds
**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	High	Ongoing	No/ or low cost to implement and require little staff support.	public works, floodplain manager	Low	Unknown
<b>Implement or improve flood warning systems.</b>										
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		Local Plans and Regulations	High	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	public works, floodplain manager	Medium	county and municipal funds
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Will ensure that citizens are prepared real time for flood events.	public works, floodplain manager	Low	county and city government
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2020	Ongoing		Local Plans and Regulations	Unspecified	Ongoing	No/ or low cost to implement and require little staff support.	public works, floodplain manager	Low	
<b>Improve flood hazard assessments and flood mapping.</b>										

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
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.	2015	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2015	Deferred		Unspecified	Unspecified					
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2015	Deferred		Unspecified	Unspecified					
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2015	Deferred		Unspecified	Unspecified					
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2015	Deferred		Unspecified	Unspecified					
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.	2015	Deferred		Unspecified	Unspecified					
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	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	emergency management	Low	government source
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2015	Deferred		Unspecified	Unspecified					
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.	2015	Deferred		Unspecified	Unspecified					

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
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	2015	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	county and municipal funds
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing		Local Plans and Regulations	High		Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager		
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2015	Deferred		Unspecified	Unspecified					
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2015	Deferred		Unspecified	Unspecified					
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2015	Deferred		Unspecified	Unspecified					
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2015	Deferred		Unspecified	Unspecified					
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.	2015	Deferred		Unspecified	Unspecified					

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
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2015	Deferred		Unspecified	Unspecified					

<b>Excelsior Springs 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Unspecified	NOT COMPLETED		building code official		NO FUNDS
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	Unspecified	NOT COMPLETED		building code official		NO FUNDS
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	Unspecified	NOT COMPLETED		building code official		NO FUNDS
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	Unspecified	NOT COMPLETED		building code official		NO FUNDS
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
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	Unspecified	NOT COMPLETED		planning; public works		NO FUNDS
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	Unspecified	NOT COMPLETED		planning; public works		NO FUNDS
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	Unspecified	NOT COMPLETED		planning; public works		NO FUNDS
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Unspecified	NOT COMPLETED		emergency management		NO FUNDS
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Deferred	Most of our city that is above ground, there is not enough space to put in underground lines.	Local Plans and Regulations	Unspecified	NOT COMPLETED				NO FUNDS



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
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deferred	Ameren MO is our local provider, they are continually looking into the issue.	Local Plans and Regulations	Unspecified	NOT COMPLETED				NO FUNDS
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	Unspecified	NOT COMPLETED		public works		NO FUNDS
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Unspecified	NOT COMPLETED		public works		NO FUNDS
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing	Lack of resources	Local Plans and Regulations	Unspecified	NOT COMPLETED		public works		NO FUNDS
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	Unspecified	NOT COMPLETED		public works	high	Make application to FEMA for grant
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Lack of resources	Education and Awareness Programs	Unspecified	NOT COMPLETED		emergency management		NO FUNDS
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred	Lack of resources	Education and Awareness Programs	Unspecified	NOT COMPLETED				NO FUNDS
<b>Increase public Education/ Awareness and Readiness for Tornadoes and Severe Thunderstorms</b>										
Host a mock drill with all city officials.	2015	Ongoing	Needs to be completed with ever changing city officials.	Education and Awareness Programs	High	Year	Low cost mechanism to increase public safety.	emergency management	0	N/A
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	0	N/A
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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	not specified	general revenue
<b>Enhance public awareness and education efforts related to flooding.</b>										



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 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	Unspecified	NOT COMPLETED		emergency management		NO FUNDS
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	Unspecified	NOT COMPLETED		emergency management		NO FUNDS
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Unspecified	NOT COMPLETED		floodplain manager		NO FUNDS
**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	Unspecified	NOT COMPLETED		floodplain manager		NO FUNDS
**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	Unspecified	NOT COMPLETED		floodplain manager		NO FUNDS
<b>Implement or improve flood warning systems.</b>										
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	Unspecified					
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	Unspecified	NOT COMPLETED		emergency management		NO FUNDS
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	Unspecified	NOT COMPLETED		floodplain manager		NO FUNDS
<b>Improve flood hazard assessments and flood mapping.</b>										
**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	Unspecified	NOT COMPLETED		planning, public works		NO FUNDS

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
**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	Unspecified	NOT COMPLETED		planning, public works		NO FUNDS
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred	Lack of resources	Local Plans and Regulations	Unspecified	NOT COMPLETED				NO FUNDS
<b>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.</b>										
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	Unspecified	NOT COMPLETED		emergency management		NO STAFF
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	Unspecified	NOT COMPLETED		public works, parks and recreation		NO STAFF
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	Lack of resources	Structure and Infrastructure Projects	Unspecified	NOT COMPLETED		floodplain manager		NO STAFF
**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	Unspecified	NOT COMPLETED		public works, planning		NO STAFF
**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	Unspecified	NOT COMPLETED		floodplain manager		NO STAFF
**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	Unspecified					
**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	Unspecified					

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
**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	Unspecified	NOT COMPLETED		floodplain manager		NO STAFF
<b>Reduce flood risk to city.</b>										
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	Unspecified					
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	Unspecified			emergency management		
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	Unspecified			public works, parks and recreation		
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	Unspecified					
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	Deferred	Lack of resources	Structure and Infrastructure Projects	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Completed		Local Plans and Regulations	Unspecified					
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Completed		Local Plans and Regulations	Unspecified					
<b>Dam Failures</b>										
<b>Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.</b>										
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		Low cost mechanism to increase public safety.	public works		

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
<b>Heat Waves</b>										
<b>Ensure local government and human service agencies are aware of A/C facilities across area that can be used as shelters in the event of a heat wave.</b>										
Identify cooling centers in the city.	2020	Ongoing	New	Local Plans and Regulations	Low		Low cost mechanism to increase public safety.	emergency management		
<b>Severe Winter Weather</b>										
<b>Increase winter weather response readiness</b>										
Identify emergency snow routes.	2020	Ongoing	New	Local Plans and Regulations	Medium			public works		
<b>Ensure local government and human service agencies are aware of facilities across area with backup power or generators that can be used as shelters in the event of severe winter weather</b>										
Identify potential sites for emergency shelters.	2020	Ongoing	New	Local Plans and Regulations	Low		Low cost mechanism to increase public safety.	emergency management		

<b>Gladstone 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Deferred		Unspecified	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	planning, building codes	Unknown	budget
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Medium	NA	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	planning, building codes	NA	NA
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Unspecified	Unspecified					
<b>Provide more public information on preparing for a disaster.</b>										
Public Education and EOP updates	2015	Ongoing		Education and Awareness Programs	High	Year	Low/no cost mechanism to increase public safety.	emergency management		EMPG
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
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	Deferred		Unspecified	Unspecified					
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Unspecified	Medium	Ongoing	No/ or low cost to implement and require little staff support.	floodplain manager	Low	Unknown
<b>Improve flood hazard assessments and flood mapping.</b>										

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 parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Deferred		Unspecified	Unspecified					
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					
<b>Severe Thunderstorms</b>										
<b>Increase public disaster preparedness.</b>										
Provide Public Education materials and EOP updates	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	EMPG

<b>Kearney 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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.	Unspecified	Low	2014	While may increase building costs, will lead to greater occupant safety		100000	not available at this time
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred	Requiring construction of tornado shelters in not currently a high priority.	Unspecified	Low	2020+	Low/no cost mechanism to increase public safety.		3000	annual department budget
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	lack of resources to accomplish this	Unspecified	Low	2020+	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.		Medium	not available at this time
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.	Unspecified	Low	2020+	Low/no cost mechanism to increase public safety.		5000	not available at this time
<b>Ensure public facilities have shelters to accommodate employees and visitors during severe weather events.</b>										
Inspect city hall and police station facilities for use as tornado/severe weather shelters and post visible signage.	2015	Deferred	City hall is utilized as a storm shelter; however we still need to improve signage.	Education and Awareness Programs	High	2022	Low cost mechanism to increase public safety.		2000	departmental budget
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Deferred	City hall is utilized as a storm shelter; however, we still need to improve signage.	Unspecified	Low	2022	Low/no cost mechanism to increase public safety.		3000	annual department budget



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
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.	Unspecified	Low			code official, planning		
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred	Lack of resources	Unspecified	Low	2020+	Increases safety of existing infrastructure for moderate cost		Medium	not available at this time
<b>Improve emergency response to large scale events</b>										
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 management	Low	Fire District Budget
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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.	Unspecified	Unspecified	Ongoing		planning, public works		
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	The City's website includes flood insurance information	Unspecified	Low	2020	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	3000	allocation in annual department budget
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.	Unspecified	Unspecified					



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
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	Deferred	The City does not have the resources at this time.	Unspecified	Low	2020	No/low cost mechanism to encourage flood preparedness.		5000	seek grants for funding
<b>Implement or improve flood warning systems.</b>										
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	Unspecified	Low	2020	Low cost mechanism to increase public safety.	emergency management	3000	allocation in annual department budget
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	Unspecified	Unspecified	Ongoing		emergency management		
<b>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.</b>										
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		Unspecified	Low	Ongoing through 2020	Low cost mechanism to improve floodplain management on local and regional levels.	emergency management	Low	annual department budget
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Unspecified	Low	Ongoing		planning, public works, parks and recreation	low	
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**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.	Unspecified	Medium	Ongoing		public works	high	
**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.	Unspecified	Medium	2025	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	100000	water and sewer revenues, 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
<b>Reduce the impact of floodwaters on residential properties.</b>										
Pass a stream buffer ordinance	2015	Deferred	Staff anticipates this to be approved within the next five years.	Natural Systems Protection	High	2025	Low cost mechanism to enforce floodplain management.		500	departmental budget
<b>Severe Thunderstorms</b>										
<b>Ensure operability of public facilities during severe weather events</b>										
Retrofit existing city facilities 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	City budget

<b>Lawson 2020 Mitigation Strategy (New Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Create a safe storm shelter for people at public campgrounds and for city lake users.</b>										
Identification and Planning	2020	New	Public safety issue has been identified but an affordable solution has yet to be found.	Structure and Infrastructure Projects	High	Unknown		planning, public works, parks and recreation	Unknown	None
<b>Create a safe storm shelter in the downtown district to house members of the community living in older homes or without basements.</b>										
Identification and Planning	2020	New	Public safety issue has been identified but an affordable solution has yet to be found	Structure and Infrastructure Projects	High	Unknown		emergency management, public works	Unknown	None
<b>Create municipal storm shelter plan and purchase required supplies to house evacuees locally.</b>										
Identification and Planning	2020	New	The community safety issue has been identified but an affordable solution has yet to be found.	Local Plans and Regulations	Medium	Unknown		emergency management, public works	Unknown	None
<b>Develop and implement a continuity of service response plan to ensure continued vital functioning of municipal government.</b>										
Identification and Planning	2020	Ongoing	Operational challenges have been identified and are being examined in follow up meetings.	Local Plans and Regulations	Medium	Unknown		city administration, emergency management	Unknown	Municipal revenues
<b>Establish a safe storm shelter at the Southwest Elementary School in partnership with the Lawson School District.</b>										
None at this time, assist only as needed	2020	Deferred	Assist the Lawson School District as needed with establishing a safe storm shelter. The School District has taken primary responsibility for this plan.	Structure and Infrastructure Projects	Low	Unknown			Unknown	None
<b>Floods</b>										
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Unspecified		Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local

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
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing		Local Plans and Regulations	Unspecified		Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	Local
<b>Execute additional storm water drainage plans as listed in the city's Storm Water Master Plan.</b>										
Execution of Plan	2020	Undetermined	Multiple storm drainage projects have been identified and are in execution as funding is obtained	Unspecified	Unspecified	ongoing		public works		Municipal revenues and local bonds
<b>Execute north fork of Fishing River Flood Plain mitigation project to lessen flood plain impact for the surrounding community.</b>										
Preliminary planning	2020	Ongoing	Discussion with public concerning projectPossible preliminary engineering	Structure and Infrastructure Projects	Medium	Unknown		public works	Unknown	None
<b>Improve in house ability to maintain and improve existing storm water drainage system by purchasing additional equipment.</b>										
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		public works	Unknown	None
Preliminary planning	2020	Ongoing	Identify equipment that would aid in maintenance of current stormwater system and procure	Other	High	Unknown		public works	Unknown	None
<b>Improve natural drainage creek to mitigate storm water flooding between North Pennsylvania and North Raum street.</b>										
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	Unknown		public works	Unknown	None
<b>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.</b>										
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.	Unspecified	High	Unknown		public works	3200000	20% funding provided by the railroad.
<b>Storm water drainage improvements near 8th Terrace.</b>										

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
Preliminary planning	2020	Ongoing	Discussion with public concerning project. Possible preliminary engineering	Unspecified	Unspecified	Unknown		public works	Unknown	None
<b>Storm water drainage improvements near Cardinal Circle/Nolker Drive.</b>										
Preliminary planning	2020	Ongoing	Discussions with public on project. Possible preliminary engineering	Structure and Infrastructure Projects	Medium	Unknown		public works	Unknown	None
<b>Storm water drainage improvements near Milwaukee Street.</b>										
Engineering and construction	2020	Ongoing	Engineering is nearly completed. Project will be going out for bid in Spring 2020. Construction to begin Summer 2020	Structure and Infrastructure Projects	High	Winter 2020		public works	400000	2016 Bond
<b>Severe Thunderstorms</b>										
<b>Establish safe storm shelter for use as an evacuation point for the municipal pool complex.</b>										
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	Unknown		parks and recreation	Unknown	None
<b>Severe Winter Weather</b>										
<b>Establish a transportation plan to evacuate at risk individuals and create a municipal warming shelter.</b>										
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		emergency management, public works	Unknown	None
<b>Heat</b>										
<b>Institute a severe heat response by purchasing in home air conditioners and establishing public cooling centers.</b>										
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		emergency management, public works	Unknown	None

<b>Liberty 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Continue to educate the public about the importance of having a weather radio in their home</b>										
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	City budget
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Unspecified	High	Ongoing	none	emergency management	none	none
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2015	Deferred		Unspecified	Unspecified					
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2015	Deferred		Unspecified	Unspecified					
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
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
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	none	building code official	none	none
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2015	Deferred	Lack of resources and funding	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
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 building and fire codes that require this	Low	Ongoing	Low/no cost mechanism to increase public safety.	planning, building code	Low	none at this time

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
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2015	Deferred	Lack of resources and funding	Unspecified	Unspecified					
<b>Improve storm warning capabilities.</b>										
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	None	N/A
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 our and apply for grants to complete	Avoid loss of life	emergency management	\$175,000	City budget or more than likely grants
Continue to work with cable providers to ensure protocols and policies in place to allow for emergency interruption warnings and messages.	2015	Deferred	Lack the resources and funding for cable interrupt services.	Education and Awareness Programs	Medium	Ongoing	Low cost mechanism to increase public safety and avoid loss of life.		Low	Unknown
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
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	City general fund
Partner w/ trade orgs. to conduct safe room workshops.	2015	Deferred	Lack of resources	Unspecified	Unspecified					
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
Levy fees on new residential, commercial and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2015	Deferred	The city does not allow development in flood plains or flood prone areas	Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2015	Deferred		Unspecified	Unspecified					



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 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	none at this 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		emergency management	n/a	none at this time
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2015	Deferred	Lack of funding and the city currently does not have any repetitive flood loss properties	Unspecified	low					
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2015	Deferred	Lack of resources	Unspecified	Unspecified					
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2015	Deferred	Lack of resources	Unspecified	Unspecified					
**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	The city currently does not have any repetitive flood loss properties.	Unspecified	Low	Ongoing	No/ or low cost to implement and require little staff support.	floodplain manager	Low	none at this time
<b>Implement or improve flood warning systems.</b>										
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.	2015	Deferred		Unspecified	Unspecified					
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2015	Deferred		Unspecified	Unspecified					
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2015	Deferred		Unspecified	Unspecified					
<b>Improve flood hazard assessments and flood mapping.</b>										



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
**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	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.	2020	Ongoing		Unspecified	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	General Fund
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing		Unspecified	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	General Fund
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2020	Ongoing		Unspecified	Low	Ongoing	Free technical assistance to improve floodplain management	planning, public works	Low	General Fund
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2015	Deferred	The city utilizes GIS data from FEMA and the Army Corp of Engineers.	Unspecified	Unspecified					
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing		Unspecified	Low	Ongoing	n/a	planning, parks and recreation, public works		
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	Unspecified	High	Developers are required to follow regional stormwater management guidelines	Costs are borne by developers	planning, parks and recreation, public works	n/a	n/a
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	2020	Ongoing	The city continues to participate in regional stormwater management practices	Unspecified	Low	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	public works, emergency management	Low	none at this time

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
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2015	Deferred	Lack of resources	Unspecified	Unspecified					
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.	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					
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	2015	Deferred	Lack of resources and the city currently does not have any flood prone properties	Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Unspecified	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	none at this time
Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing		Unspecified	Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	none at this time
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					

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
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					
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.	2015	Deferred	Lack of resources and funding. The city currently does not have any flood prone properties	Unspecified	Unspecified					
<b>Severe Thunderstorms</b>										
<b>Description Continue to monitor weather situation and provide warnings through Public relations department</b>										
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	Avoid loss of life	emergency management	Unknown	Unknown

<b>Mosby 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	Unspecified			public works	Low	Local
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	Deferred	Lack of resources	Unspecified	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred	Lack of resources	Unspecified	Unspecified					
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	No new public facilities anticipated	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred	No new public facilities anticipated	Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Materials available if requested	Unspecified	Medium	Ongoing	Educating public about ways to protect themselves from hazards so they remain safe	emergency manager	0	NA
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred	Lack of resources	Unspecified	Low		public safety		0	NA
<b>Floods</b>										
<b>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.	2010	Ongoing	Materials available if requested	Unspecified	Medium	Ongoing	Low cost mechanism to educate residents.	emergency manager	0	NA

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
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	Deferred	Lack of resources	Unspecified	Unspecified					
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Medium	Ongoing	Prevent future flooding of properties that have experienced past damage from floods	floodplain manager	36000	FEMA Buy Out
**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	floodplain manager	0	City
**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		Unspecified	Medium	Ongoing	continually looking for ways to prevent damages to residential properties	floodplain manager	\$50 per month	City budget
<b>Implement or improve flood warning systems.</b>										
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	Unspecified	Ongoing		emergency manager		
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Unspecified	Medium	Ongoing	Allows for coordination of emergency management services in case evacuations or other actions are necessary	emergency manager	less than \$100	None
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Unspecified	Low	Ongoing	City would be able to take property that repeatedly floods and use it for recreational purposes	city board of aldermen	Unknown	City/FEMA

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
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	Low	Ongoing	City would be able to remove problematic properties and gain a park or open space - need to find out what is allowable on property	city board of aldermen	Unknown	City budget/FEMA grant
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Deferred		Unspecified	Unspecified					
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	Medium	Ongoing	Provide financial protection for property owners	floodplain manager	depends on cost of insurance	City budget
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	High	Ongoing	Removing structures that repetitively get flooded.	floodplain manager	Depends on cost of property	FEMA buyout program
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Unspecified	Unspecified			floodplain manager	Low	Local
Work with County to explore funding to demolition, retrofit and/or replace damaged bridges in and around city.	2020	New		Structure and Infrastructure Projects	High	Ongoing	Removal and/or upgraded bridges will reduce flooding and increase public safety during floods and emergencies.	city board of aldermen	High	Local and Grants

<b>North Kansas City 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Unspecified	Ongoing		emergency management		
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred	Lack of Staffing	Unspecified	Unspecified					
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	Lack of Funding	Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Deferred	Lack of Funding	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
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	Budgeted
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										



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
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 management	5600	Budgeted
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	High	Ongoing	Low cost mechanism to increase public safety.	emergency management	Minimal	budget
<b>Increase public awareness and understanding of severe weather events and safe practices.</b>										
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	budget
<b>Floods</b>										
<b>Conduct special education events such as flood mitigation and preparedness.</b>										
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.		N/A	Budgeted
<b>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.</b>										



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
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	Budgeted
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Deferred	Not relevant to the City of North Kansas City.	Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing		Local Plans and Regulations	Unspecified		Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Local
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2015	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	No Cost	N/A

<b>Smithville 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred		Unspecified	Unspecified					
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred		Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Deferred		Unspecified	Unspecified					
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Deferred		Unspecified	Unspecified					
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deferred		Unspecified	Unspecified					
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										

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
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing		Structure and Infrastructure Projects	Medium	Next 5 Years	No cost mechanism to increase public safety.	public works	Low	Local
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred		Unspecified	Unspecified					
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	Ongoing		Structure and Infrastructure Projects	Medium	Next 5 Years		public works	High	Local
<b>Increase emergency shelter capacity.</b>										
Develop relationships with area churches, library and senior center for use of facilities if needed as a shelter.	2015	Ongoing		Education and Awareness Programs	Medium	Ongoing	No cost mechanism to increase public safety.	emergency management	None	N/A
Hold discussions with school district to obtain permission to use Performing Arts Center as a tornado shelter	2015	Ongoing		Education and Awareness Programs	Medium	Ongoing	No cost mechanism to increase public safety.	emergency management	None	N/A
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Deferred		Unspecified	Unspecified					
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred		Unspecified	Unspecified					
<b>Increase public safety alert and warning mechanisms.</b>										
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	None	N/A
Provide officers on-going training in use of the tornado siren system.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	No cost mechanism to increase public safety.	emergency management	None	N/A
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	None	N/A
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

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
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Deferred		Unspecified	Unspecified					
**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	Unspecified	Unspecified			floodplain manager	Low	Local
<b>Implement or improve flood warning systems.</b>										
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	Deferred		Unspecified	Unspecified					

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
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Deferred		Unspecified	Unspecified					
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Deferred		Unspecified	Unspecified					
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deferred		Unspecified	Unspecified					
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Deferred		Unspecified	Unspecified					
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Deferred		Unspecified	Unspecified					
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred		Unspecified	Unspecified					
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					

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
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	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**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
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	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	No Cost	N/A
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Deferred		Unspecified	Unspecified					
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					

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
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

<b>Fishing River Fire Protection District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase public awareness and understanding the benefits of "safe rooms"</b>										
Work with housing subdivisions to provide residents with educational materials about tornadoes and keeping safe.	2015	Ongoing	continuing working with the subdivisions in educating about Natural disasters.	Education and Awareness Programs	Medium	Ongoing	Low cost way of increasing safety for homeowners	emergency management	Low	Fire District Budget
Work with schools within jurisdiction to provide students, staff and families educational materials about tornadoes and keeping safe.	2015	Ongoing	continuing working with the school in educating about Natural disasters.	Education and Awareness Programs	High	Ongoing	Low cost way of increasing safety for students, staff, families etc associated with school	emergency management	Low	Fire District Budget
Work with the Liberty Hill Country Club to increase awareness and determine options for safe shelter at that location.	2015	Ongoing	continuing working with the Liberty Hills Country Club in educating about Natural disasters.	Education and Awareness Programs	Medium	Ongoing	Low cost way of increasing safety for those that work and recreate at the Country Club	emergency management	Low	Fire District Budget
<b>Floods</b>										
<b>Encourage and assist with the implementation of levee maintenance practices to prevent levee failure and flooding.</b>										
Provide information to residents in Mosby and Missouri City about flooding, steps they can take to prevent property damage, and evacuation procedures.	2015	Ongoing	Trying to keep the citizens aware of some preventive measures and making them aware of rising water situations.	Education and Awareness Programs	Medium	Ongoing	Low cost way of increasing safety and preventing property damage	emergency management	Low	Fire District Budget
Work with levee districts to coordinate prescribed burn efforts that help maintain the amount of vegetation and debris on the levees.	2015	Ongoing	This is an ongoing procedure.	Natural Systems Protection	Medium	Ongoing	Low cost way of ensuring that prescribed burning efforts take place safely and in ways that ensure the protection of the levees.	emergency management	Low	Fire District Budget
<b>Enhance public awareness and education efforts related to flooding.</b>										
Provide information to residents in Mosby and Missouri City about flooding, steps they can take to prevent property damage, and evacuation procedures.	2015	Ongoing	Continuing to communicate and keeping the cities informed of weather situation and ways to help them to try and reduce damage of flooding.	Education and Awareness Programs	Medium	Ongoing	Low cost and effective way to make sure that residents are aware of and understand the danger of a likely flood	emergency management	Low	Fire District Budget
<b>Implement comprehensive flood warning notifications.</b>										



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
Plan to coordinate door to door flood notification with use of existing siren system.	2015	Ongoing	Continuing to use this procedure along with social media to inform citizens of flooding situations.	Education and Awareness Programs	Medium	Ongoing	Low cost and effective way to make sure that residents are aware of and understand the danger of a likely flood	emergency management	Low	Fire District Budget
<b>e</b>										
<b>Increase public awareness and understanding about the hazards associated with thunderstorms such as lightning strikes and high winds.</b>										
Work with housing subdivisions to provide residents with educational materials about keeping safe and ways to avoid damage during severe thunderstorms.	2015	Ongoing	Continuing working with the subdivisions in educating about natural disasters.	Education and Awareness Programs	Medium	Ongoing	Low cost way of increasing safety for homeowners	emergency management	Low	Fire District Budget
Work with schools within jurisdiction to provide students, staff and families educational materials about ways to keep safe during a thunderstorm.	2015	Ongoing	Continuing working with the school in educating about natural disasters.	Education and Awareness Programs	High	Ongoing	Low cost way of increasing safety for students, staff, families etc associated with school.	emergency management	Low	Fire District Budget
Work with the Liberty Hill Country Club to increase awareness about keeping safe during severe thunderstorms.	2015	Ongoing	Continuing working with the Liberty Hills Country Club in educating about natural disasters.	Education and Awareness Programs	Medium	Ongoing	Low cost way of increasing safety for those that work and recreate at the Country Club.	emergency management	Low	Fire District Budget

<b>Jackson County 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>													
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
<b>Tornadoes</b>													
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>													
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		High	Existing	Eastern Jackson County has designated shelter /safety locations as part of the Office of Emergency Preparedness function within County ordinances 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.					public works, code officials	Ongoing				
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.		High	Existing	Eastern Jackson County has designated shelter /safety locations as part of the Office of Emergency Preparedness function within County ordinances 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	Unknown
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>													
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Deleted	The County Continues to review and adopt local building codes to improve the structural and architectural safety of structures		High	New	County Building regulations and Code compliance	Public Works Department	Ongoing	High cost to design and build stronger facilities but can prevent large number of injuries and fatalities. Some cost could be subsidized by tax incentives and grants		Medium	County general funds
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deleted	The County continues to encourage developers in non-incorporated County areas and local jurisdictional review of building codes / regulations /architectural designs		High	New	County Building regulations and Code compliance	Department of Emergency Preparedness/County and Public Works Department	Ongoing	Low/no cost mechanism to increase public safety.		Low	County general funds
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		High	New and Existing	Office of Emergency Preparedness function within County ordinances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>													

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
requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deleted	The County currently does not have regs requiring compliance										
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deleted	The County does not have tax incentives for residential/construction code requirements										
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		High		Office of Emergency Preparedness function within County ordinances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
<b>Increase capabilities to provide mass notifications to the public</b>													
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 ordinances 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
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>													
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 ordinances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County General Funds
<b>Flooding</b>													
<b>Discourage new development in floodplains and flood-prone areas and improve safety for the traveling public from flash floods across roadways.</b>													
**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		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						public works					
**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		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

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
**Identify low water crossings along roadways in unincorporated Jackson County	2020	Ongoing	In progress; as identified putting up signage	planning	medium			Flood Plain Management/ Public Works/Emergency Preparedness					
and infrastructure development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2010	Deleted	Not a county function										
<b>Enhance public awareness and education efforts related to flooding.</b>													
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.		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.		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.		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
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>													

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
**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.		High	Existing	Public Works and Emergency Preparedness function within approved County ordinances 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.		High	Existing	Public Works and Emergency Preparedness function within approved County ordinances 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		High	Existing	Public Works and Emergency Preparedness function within approved County ordinances 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		Medium	New	Public Works and Emergency Preparedness function within approved County ordinances 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
<b>Implement or improve flood warning systems.</b>													
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	Deferred	Eastern Jackson County utilizes real time weather and USGS real-time water data for local daily stream flow conditions which are operated in cooperation with the USGS.		High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordinances and codes	Public Works Department and Office of Emergency Preparedness	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.		Low	County General Funds and EMPG grants
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	Deferred	The County uses Flood warning procedures supported by NOAA to acquire real-time flood inundation prediction capability using stream gauge and forecast information.		High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordinances and codes	Public Works Department and Office of Emergency Preparedness	Flood warning procedures supported by NOAA	Will ensure that citizens are prepared real time for flood events.		Low	County General Funds and EMPG grants



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Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2020	Deferred	Eastern Jackson County has real time weather data stations that track local activity on a regular basis		High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordinances and codes	Public Works Department and Office of Emergency Preparedness	Ongoing	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.		Low	County General Funds and EMPG grants
<b>Improve emergency response during flooding events.</b>													
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 ordinances and codes	Office of Emergency Preparedness	Ongoing	No/low cost mechanism to reduce flood damages		Low	County General Funds and EMPG grants
<b>Improve flood hazard assessments and flood mapping.</b>													
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	Deleted	The County 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 with numerous County departments		High	New and Existing Areas	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	County's General Funds
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deleted	The County 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 with numerous County departments		High	New and Existing Areas	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	County's General Funds
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing	Although flood hazard areas of the County have been mapped with current FEMA flood map digital data that is integrated into county geo-data on a regular basis. The County continues to review flood hazard areas and incorporate necessary changes as needed.		High	New and Existing Areas	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	County's General Funds

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Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deleted	The County 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 capability's in partnership with numerous County departments		High	New and Existing Areas	Flood Plan Management, Public Works and Emergency Preparedness addressing FEMA NFIP requirements	Flood Plan Management/Public Works	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	County's General Funds
<b>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.</b>													
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		High	Existing	Public Works and Emergency Preparedness function within approved County ordinances 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 as open space land.		High	New and Existing	Public Works and Emergency Preparedness function within approved County ordinances 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.		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.		High	Existing	Public Works, Parks & Rec and Emergency Preparedness Department functions within approved County ordinances 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

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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 habitats		High	Existing	Public Works and Emergency Preparedness Department functions within approved County ordinances 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.		High	New & Existing	Numerous County Department functions within approved County ordinances and codes	Department of Emergency Preparedness/County	Ongoing	Low/no cost mechanism to increase public safety.		Low	County general funds
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>													
**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.		High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordinances 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 Community Rating System (CRS).	2020	Ongoing	The County has adopted the NFIP regulations and continues to participate in the program completing mandatory maintenance as required by program 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
<b>Reduce flood losses within the County.</b>													
Facilitate river flood gates for Fire Prairie Creek, Levasy, MO	2015	Deleted	Help facilitate the design and implementation of flood gate to prevent flooding events that occur on a regular basis.	Structure and Infrastructure Projects	Medium	new	Office of Emergency Preparedness and Public Works Department functions and Levasy ordinances and codes	City of Levasy and County Department of Emergency Preparedness	Ongoing	No/low cost mechanism to reduce flood damages		Low	County General Funds and EMPG grants
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>													
**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		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



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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		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		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.		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
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deleted	The County 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.		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	Private Sector and City general funds and/or grant funding
<b>Severe Winter Weather</b>													
<b>Enhance public awareness of severe winter weather mitigation and preparedness activities.</b>													
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.		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.		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

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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.		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.		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
<b>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.	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.		High	Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Fairly high cost installation price but will ensure continuity of shelter operations.		Medium	Unknown
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		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	Unknown
<b>Increase planning and severe weather coordination between regional partners</b>													
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
<b>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.</b>													

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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.		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.		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		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
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.	2020	Deferred	The County Public works Department works with regional partners regarding salt and sand contracts		Medium	New	Public Works function within Code of Ordinance	Public Works	NA	Low cost mechanism to cost share and increase availability of sand stockpiles.		Low	General Fund
<b>Drought</b>													
<b>Ensure plans and procedures addressing local drought response, drought mitigation and long-term water planning are developed.</b>													
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.		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				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
<b>Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.</b>													
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.		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
<b>Heat Waves</b>													
<b>Enhance public awareness of the hazards associated with heat waves, precautionary measures and area heat wave mitigation and preparedness activities.</b>													

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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.		High	Existing	Emergency Preparedness working with local health departments and NOAA	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG
Develop and conduct a public education and awareness campaign on properly weather stripping homes.	2015	Deferred	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. The educational program also includes information about making residents homes more energy efficient.		High	Existing	Emergency Preparedness working with local health 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.		High	Existing	Emergency Preparedness working with local health 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 City's Office of Emergency Preparedness 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.		High	Existing	Emergency Preparedness working with local health departments and NOAA	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG
<b>Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.</b>													
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.		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	Unknown



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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 Counties 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"		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
<b>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.</b>													
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.		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.		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	Unknown
<b>Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.</b>													
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.		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.		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

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Temporarily reduce or eliminate fees for public swimming pools during extended periods of extreme heat and humidity.	2010	Deleted	Not a county function										
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.		High	Existing	Emergency Preparedness working with Safe Shelter Partnerships FBI/O	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	EMPG and County General Fund
<b>Increase communication and Planning capabilities between Public Safety agencies.</b>													
Develop a communication network between Emergency Management Agencies, Health Departments throughout the County with the Jackson County Medical Examiners Office	2015	Deferred	Establish a dedicated communications and planning group between public safety, health departments and emergency management agencies within the county	Local Plans and Regulations	Medium	New & Existing	Emergency Preparedness working with local health departments, public safety and medical examiner's office	Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	County Emergency Preparedness Budget/EMPG
<b>Dam Failures</b>													
<b>Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.</b>													
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.		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						emergency preparedness office	Ongoing				
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.		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

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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.		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
<b>Improve warning and evacuation systems and procedures in the event of dam failure.</b>													
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.		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
<b>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	Ongoing						public works	Ongoing				
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						public works	Ongoing				
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						public works	Ongoing				
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						county legislature	Ongoing				
<b>Severe Thunderstorms</b>													
<b>Increase severe weather warning capabilities.</b>													
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	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	Unknown
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
<b>Levee Failures</b>													
<b>Improve levee warning systems.</b>													

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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



<b>Blue Springs 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>													
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
<b>Tornadoes</b>													
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>													
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2020	Ongoing	The City currently utilizes the 2012 editions of the International Building Code, future adoption of the 2018 Codes is anticipated in 2020.	planning	Medium			planning, building codes				TBD	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	Deferred	This option will be reviewed when considering code changes and amendments.										
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deferred	May be included with the code revision.										
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	Deferred	The Eastern Jackson County Home Builders Association will be included in overall discussions as the process evolves.										
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>													
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Complete							pre 1990				
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2020	Ongoing			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			unknown	Utility
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing			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	on going			N/A Occurs with development	N/A
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>													
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing			Medium	New	Plan reviews and code requirements, if adopted.	Community Development staff	October 1, 2014			\$7,500	City's General Fund

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Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing			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			Unknown at this time	Unknown at this time
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing			Medium	New	The new building designs will include rooms that provide safe refuge from tornados and storms.	Planning and Codes Departments	Ongoing			unknown	project budget
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>													
Develop, distribute informational materials on safe rooms.	2010	Deferred	This component will be considered in conjunction with the update of our development code.										
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred	This component will be addressed with the update of the development code.										
<b>To use the latest guidance issued in upcoming International Building Code IBC versions.</b>													
Update Building regulations as the IBC changes	2020	Ongoing		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
<b>Floods</b>													
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>													
**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.	2020	Ongoing			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			Depends on the situation.	City's General Fund
**b. Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Ongoing			Low	Existing	Public Works grant searches.	Blue Springs Public Works	Ongoing			None at this time.	TBD
c. As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred	Due to the current economy the Capital Improvement Budget is only addressing maintenance needs.									Only one property has been identified in the last 10 years. The property was purchased.	

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**d. With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing			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			The City has very few homes that experience overland flow issues. Most are simply yard flooding that does not impact the structure. It is also very short lived. Generally, 15 minutes or less.	City's General fund and CIP Budget
<b>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.</b>													
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			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			N/A	Developer / Owners
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.	2010	Completed							Pre 1990				
c. Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	Ongoing			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			N/A	N/A

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d. Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing			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			TBD	TBD
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	2010	Deferred	The city is currently working through a multi year plan to assess the watersheds throughout the city and determine the best management practices associated with each situation.										
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			Medium	Existing	The City partners with the Jackson County Storm water commission to identify regional initiatives and programs.	Jackson County Storm water Commission	Ongoing			\$7,500 per year	City's general fund
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>													
a. Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing			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			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.	2010	Completed							Ongoing				
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.	2010	Completed							Ongoing				
d. As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred	This initiative has been deferred until funds become available.										
e. Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Deferred	The process of elevating entire structures is complicated and expensive. In most cases there are more attractive and economical options available.										
<b>Discourage new development in floodplains and flood-prone areas.</b>													

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a. Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010		Complete						Pre 2000				
<b>Improve flood hazard assessments and flood mapping.</b>													
**a. Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing			Low	Existing	The data is available through the City's GIS system.	Community Development	Ongoing			TBD	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.	2010	Completed							October 2007				
<b>Enhance public awareness and education efforts related to flooding.</b>													
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.	2010	Deferred	Standard practice is to direct interested parties to the FEMA website.										
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>													
a. Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Completed							September 1978				
**b. Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing			High	New	Project Plan Review	Public Works Engineering	Ongoing				General Fund
<b>To continue to monitor for possible flooding issues within the city and adapt solutions to correct the issues when they arise.</b>													
Monitor for FEMA Flood Map updates	2020	Ongoing		Local Plans and Regulations	High	Overall	Flood Plain Management	Planning and Development Department	Ongoing	N/A	N/A	N/A	General Fund
Update DAM EAP Annually	2020	Ongoing		Local Plans and Regulations	High	Yes	Local Emergency Operations Planning	Public Works	Annual	N/A	N/A	N/A	General Fund
<b>Severe Winter Weather</b>													
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of severe winter weather.</b>													
a. Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Completed							pre 1990 mid level transmission lines				
b. Offer incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing					Department discussions with the utility provider.	Kansas City Power & Light	Ongoing			???	Utility
<b>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>													
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			Medium	New	Discussions and project reviews.	Blue Springs and CJCEMA	Ongoing			???	Developer
b. Retrofit otherwise suitable existing facilities with generators for emergency power.	2020	Ongoing			High		MARC emergency management in conjunction with Central Jackson County Emergency Management.	MARC	ongoing			????	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			Medium	New	Strategic planning and plan review.	City/ owner/ developer	ongoing			????	Owner / developer
<b>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</b>													



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a. Budget for the stockpiling of sand, salt and other materials necessary to reduce or eliminate ice on roadways and improve road conditions.	2010	Completed							Pre 1984				
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.	2010	Deferred	Considering the viability of the regional stockpiling concept for operations.										
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.).	2010	Deferred	Considering the viability of the concept as it relates to the suburban areas.										
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	2010	Deferred	Due to the economy, this idea has been put on hold until companies are on surer footing. Media coverage of companies that offer this option applies peer pressure to their competition.										
<b>Enhance public awareness of severe winter weather mitigation and preparedness activities.</b>													
a. Develop and conduct a public education and awareness campaign on properly winterizing homes.	2010	Deferred	This option is being considered.										
b. Collect and disseminate public education materials that address winter weather safety, preparedness and mitigation activities.	2010	Deferred	The city is not sure if another outlet is needed. The local media does several features on home winterizing each year.										
c. Provide vulnerable populations with winter weather safety, preparedness and mitigation information.	2010	Deferred	Several departments and sub entities have the ability to disseminate information, but a clear concise message must be formulated.										
<b>Drought</b>													
<b>Assess the vulnerability of water systems.</b>													
a. Conduct an assessment of the vulnerability and water use demand of local water systems by utilizing the procedures in the Missouri Drought Plan.	2010	Deferred	The City's water model will have to be updated using the Missouri Drought Plan parameters. The current plan is designed for the NFP.										
b. Partner with MDNR (Public Drinking Water and Water Resources Programs) and USDA to use USDA's Reservoir Operation Study (RESOP) computer program to determine the performance capacity of local reservoirs.	2010	Deferred	This will also depend on the water model.										
<b>Ensure plans and procedures addressing local drought response, drought mitigation and long-term water planning are developed.</b>													
a. Review the Missouri Drought Plan, as well as local drought plans available from MDNR, and develop a local drought plan.	2010	Deferred	to be performed after the water model is updated.										
b. Develop local procedures implementing the provisions of the Missouri Drought Plan.	2010	Deferred	Again, all predicated on the water model being calibrated to the Missouri Drought Plan criteria.										
c. Working with MARC, develop drought plans and water conservation programs.	2010	Deferred	Development to be done after the water model is updated.										

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<b>Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.</b>													
a. Develop and conduct public education and awareness programs on drought mitigation, drought response and water conservation.	2010	Deferred	We need to determine the plan before we can educate the public.										
b. Collect and disseminate public education materials that address water conservation techniques and strategies, particularly those addressing agricultural drought mitigation and management.	2010	Deferred	Same as above										
<b>Encourage water conservation efforts by commercial, industrial and private water users.</b>													
a. Develop and implement a program to encourage voluntary water conservation.	2010	Deferred	After the plan is developed.										
b. Offer economic incentives to encourage water conservation, e.g., through modification of water rate structures.	2020	Ongoing			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\$	N/A
c. Develop and implement water conservation ordinances.	2020	Ongoing			Medium	Existing	Code of Ordinances - Water Rates	Blue Springs Water Department	On going			\$0	N/A
<b>Encourage improvements to water system infrastructures to reduce vulnerability to drought and meet water use demands.</b>													
a. Budget for infrastructure improvements to municipal water systems.	2020	Ongoing			Medium	Existing	System improvements are continuously included in the Capital Improvement Program.	Blue Spring Public Works Department	On Going			\$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			High	Existing	Capital Improvement Program	Blue Springs Public Works	On Going			\$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.	2010	Complete							January 2015 through Tri County Water Authority				
<b>To ensure an adequate water supply by maintaining contracts for water purchase from three separate entities.</b>													
Monitor water use during times of drought and use voluntary restrictions if warranted	2020			Local Plans and Regulations	High	Yes	Water Modeling	Public Works	Annual	N/A	N/A	N/A	N/A
<b>Heat Waves</b>													
<b>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.</b>													
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.	2010	Completed							June 2014				
b. Retrofit otherwise suitable existing facilities with air conditioning systems and designate them as shelters for use during heat waves.	2010	Completed							June 2014				
<b>Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.</b>													
a. Identify at-risk, low income and elderly residents and develop a database and map (or GIS layers) of their places of residence.	2010	Deferred	Proposed for a future budget year when interns are available.										
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.	2010	Completed							June 2014				

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c. Work with utility providers to develop and implement programs to reduce, eliminate or defer air conditioning costs for elderly, low income and at-risk people in the community.	2010	Deferred	Future project with KCP&L.										
<b>Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.</b>													
a. Develop local heat emergency plans or heat wave annexes to local emergency operations plans.	2010	Completed							June 2014				
b. Consider developing a regional heat emergency plan for the greater Kansas City metropolitan area.	2010	Deferred	Will work wit MARC when the plan is being assembled. Blue Springs has not historically had issues with wide spread heat wave problems.										
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	Deferred	May be included in CERT Team duties in the future.										
e. Temporarily reduce or eliminate fees for public swimming pools during extended periods of extreme heat and humidity.	2010	Deferred	The issue has not been identified as a need.										
<b>Enhance public awareness of the hazards associated with heat waves, precautionary measures and area heat wave mitigation and preparedness activities.</b>													
a. Collect and disseminate public education materials that address heat wave safety, preparedness and mitigation activities.	2010	Completed							May 2013				
b. Provide vulnerable populations with public education materials that address heat wave safety, preparedness and mitigation activities.	2010	Deferred	The media in Kansas City and MARC do a good job of informing the public.										
c. Work with the media to publish special newspaper sections or conduct periodic broadcasts with emergency information on extreme heat.	2010	Deferred	Will be placed in the City's magazine for the summer.										
d. Develop and conduct a public education and awareness campaign on properly weather stripping homes.	2010	Deferred	KCP&L and MGE already send out fliers in the fall concerning weather stripping.										
<b>To continue to offer air conditioned shelters during heat waves.</b>													
Offer air conditioned facilities to the public during heat waves	2020	Ongoing	Vesper Hall is available during business hours		M		CJCEMA	Blue Springs	N/A0	N/A	As identified, 5 people in one season have used the facility while their A/C was being repaired.	N/A	General Fund
<b>Dam Failures</b>													
<b>Improve hazard assessment information for dams across the Kansas City metropolitan area.</b>													
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.	2010	Completed							2007				
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.	2010	Completed							2010				



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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.	2010	Completed							2010				
d. Include maps and information from inundation studies and dam emergency action plans in local emergency operations and land use plans.	2010	Completed							2010				
<b>Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.</b>													
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.	2010	Deferred	Will develop a brochure for those in the path in the future. The dam in our area is backed up by the base of I-70, which makes a full breach nearly impossible.										
c. Provide property owners in or near the inundation pathways of dams with information on dam safety, preparedness and mitigation activities.	2010	Deferred	See question 6.										
d. 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	Deferred	See question 6.										
<b>Reduce the potential for dam failures by enhancing inspection efforts.</b>													
a. 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.	2010	Deferred	Looking at similar policies.										
b. Adopt codes or ordinances requiring permits, engineering studies and safety certifications prior to the construction of new dams.	2010	Completed							2007				
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.	2010	Completed							2010				
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.	2010	Completed							2010				
<b>Improve the structural integrity of dams to reduce the threat of dam failures.</b>													
a. Identify and pursue grants and/or low interest loans to repair or improve dams.	2010	Deferred	No dams currently fit this description. If it becomes an issue grants will be pursued.										
c. Budget for regular repairs and improvements to dams, particularly those that are publicly owned.	2020	Ongoing			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
d. Develop and implement codes and ordinances requiring minimum site and construction standards for dams.	2010	Completed							2010				
<b>Improve warning and evacuation systems and procedures in the event of dam failure.</b>													

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
b. Work with dam owners, particularly USACE, emergency management and other public safety agencies to develop and conduct emergency response exercises.	2010	Deferred	Exercising more critical hazards at this time. It will be considered for a future training exercise.										
c. Adopt policies, codes or ordinances discouraging development in the vicinity of dam inundation zones.	2010	Completed							2012				
<b>To update the Dam Emergency Action Plan annually.</b>													
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	N/A	N/A
<b>Severe Thunderstorms</b>													
<b>To maintain the level of awareness and public education concerning severe thunderstorms as guided by the NWS.</b>													
To maintain the level of awareness and public education concerning severe thunderstorms as guided by the NWS.	2020	Ongoing						CJCFPD					

<b>Grandview 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Assist housing and business recovery</b>										
Educate and awareness	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	None done to date	emergency management	No cost estimates done to date.	City Funds, Federal and State Aid
<b>Collect and dispose of debris</b>										
Contract debris disposal	2015	Ongoing	We view this as part of a response plan versus mitigation.	Local Plans and Regulations	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
Educate and awareness	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	None done to date	emergency management	No cost estimates done to date.	City Funds, Federal and State Aid
Place directional signage	2015	Ongoing	We view this as part of a response plan versus mitigation.	Education and Awareness Programs	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Local Plans and Regulations	Medium	Unknown		building services	Unknown	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	Adopt 2018 Building Code. Community Development, Building Services.	Education and Awareness Programs	Medium	Unknown		building services	Unknown	Unknown
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
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.	Unspecified	Medium	Unknown		planning & zoning	Unknwon	Unknown
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.	Unspecified	Unspecified			planning & zoning		
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	Community Development, Building Services.	Unspecified	Unspecified			emergency management		
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										

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
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.	Unspecified	Medium	Unknown		planning & zoning	Unknown	Unknown
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing	Report any identified concerns to KCP&L.	Unspecified	Medium	Unknown		local utilities	Unknown	Unknown
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.	Unspecified	Unspecified			city administration		
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
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.	Unspecified	Medium	Unknown		fire department	Unknown	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.	Unspecified	Medium	Unknown		planning & zoning	Unknown	Unknown
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.	Unspecified	Unspecified			public works		
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Previously deferred, need to create materials for distribution. Community Development, Building Services.	Unspecified	Unspecified			emergency management		
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.	Unspecified	Unspecified			emergency management		
<b>Restore transportation network</b>										

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
Clean Streets	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
Dispose of debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
<b>Secure property</b>										
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	None done to date	first responders	No cost estimates done to date.	City Funds, Federal and State Aid
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.	Structure and Infrastructure Projects	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
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	None done to date	city administration	No cost estimates done to date.	City Funds, Federal and State Aid
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
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.	Unspecified	Low	Ongoing		community development	Unknown	Unknown

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 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.	Unspecified	Low	Ongoing		community development	Unknown	Unknown
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.	Unspecified	Low	Ongoing		community development	Unknown	Unknown
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**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.	Unspecified	Medium	Ongoing		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.	Unspecified	Medium	Ongoing		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.	Unspecified	Low	Ongoing		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.	Unspecified	Medium	Ongoing		public works	\$5,000 per year	General Fund
<b>Implement or improve flood warning systems.</b>										
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.	Unspecified	High	Ongoing		emergency management	Unknown	Unknown



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
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.	Unspecified	Low	Ongoing		public works	Not known	Not known
<b>Improve flood hazard assessments and flood mapping.</b>										
**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	Unspecified	Low	2018		public works	10000	Grants, 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.	Unspecified	Low	Ongoing		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.	Unspecified	Medium	Ongoing		community development	Unknown	Unknown
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.	Unspecified	Medium	Ongoing			\$2,500 per year	General Fund
**Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Ongoing	Public Works	Unspecified	Low	Ongoing		public works	\$500 per year	General Fund
<b>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.</b>										
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.	Unspecified	Medium	Ongoing		community development, parks, public works	Unknown	Unknown
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 subdivision regulations to ensure adequate requirements. Individual plan review. Public Works, Community Development.	Unspecified	Medium	Ongoing		community development, parks, public works	Unknown	Developer costs

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
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.	Unspecified	Medium	Ongoing		community development, parks, public works	Unknown	Unknown
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.	Unspecified	Medium	Ongoing		community development, parks, public works	Unknown	Unknown
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.	Unspecified	Medium	Ongoing		community development, parks, public works	\$1,000 per year	General Fund
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**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.	Unspecified	Low	Ongoing		community development, public works	\$500 per year	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.	Unspecified	Low	Ongoing		business services	\$2,500 per year	Permit fees
<b>Severe Thunderstorms</b>										
<b>Restore Street System</b>										
Clean debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Natural Systems Protection	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
Dispose of debris	2015	Ongoing	We view this as part of a response plan versus mitigation.	Structure and Infrastructure Projects	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
<b>Restore utilities</b>										



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
Clear transportation networks	2015	Ongoing	We view this as part of a response plan versus mitigation.	Local Plans and Regulations	High	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
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	None done to date	public works, communications	No cost estimates done to date.	City Funds, Federal and State Aid
Plan infrastructure/Grid protection	2015	Ongoing	Coordinate with KCP&L as needed.	Structure and Infrastructure Projects	Medium	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid
Provide temporary shelter and water	2015	Ongoing	Share shelter plan with Hazard Mitigation team. Public Works.	Local Plans and Regulations	Medium	As needed	None done to date	public works	No cost estimates done to date.	City Funds, Federal and State Aid

<b>Greenwood 2020 Mitigation Strategy (New Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Community education for all types of disasters including tonadoes, winter weather, heat and severe storms among other types of emergencies and disasters.</b>										
Prepare and disseminate information to residents and those working in the city through employers on emergency preparedness tips.	2020	New	will begin work in 2020	Education and Awareness Programs	Medium	2025		emergency management	low cost	city resources
<b>To increase access to safe rooms or shelters for our residents.</b>										
Identify buildings in the city that could be used as storm shelters and determine if additional shelter space is required.	2020	New	will begin work in 2020	planning	Medium	2022		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	New	will seek funds once planning work is completed	Structure and Infrastructure Projects	Medium	2025		emergency management	unknown	grant funds
<b>Floods</b>										
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2020	Ongoing	Current NFIP Participant	Unspecified	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		Unspecified	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
<b>Heat</b>										
<b>Implementing education as well as working on ways to help with the vulnerable populations to provide options for cooling in the summer months.</b>										
Identify vulnerable populations in the city and determine how to assist them during severe heat	2020	New	will begin work in 2021	planning	Medium	2022		emergency management	low cost	
<b>Severe Winter Weather</b>										
<b>To help support vulnerable persons in our community during severe winter weather if power is affected.</b>										
Identify vulnerable populations in the city and determine how to assist them during severe winter weather	2020	New	will begin work in 2021	planning	Medium	2022		emergency management	low cost	

<b>Independence 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>													
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
<b>Tornadoes</b>													
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>													
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing	The Community Development Department adheres to the standards in the 2012 International Building Code.					community development dept					City's General Fund, Grants, or other future sources
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	The Community Development Department adheres to the standards outlined in the 2012 International Building Code.					community development dept					City's General Fund, Grants, or other future sources
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	The Community Development Department adheres to the standards outlined in the 2012 International Building Code.					community development dept					City's General Fund, Grants, or other future sources
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>													
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	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.		High	New	Office of Emergency Preparedness functions within City ordinances 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		High	Private Sector Funding
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	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.					community development dept					City's General Fund, Grants, or other future sources
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	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.		High	New	Office of Emergency Preparedness functions within City ordinances and codes	Emergency Preparedness Office	On-Going	Low/no cost mechanism to increase public safety.	Low	.Low	General Funds and EMPG grants
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>													
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	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.					Independence P&L					City's General Fund, Grants, or other future sources

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
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	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.					Independence P&L					City's General Fund, Grants, or other future sources
<b>Encourage Water Utility to install generators for emergency power should power lines go down.</b>													
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.	2020	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.		High	New		Water Dept					City's General Fund, Grants, or other future sources
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>													
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	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.					community development dept					City's General Fund, Grants, or other future sources
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	The city continues to try and develop storm shelters in existing public facilities as funding and opportunities become available.		High	Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	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	City's General Fund, Grants, or other future sources
Review existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	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		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low/no cost mechanism to increase public safety.		Low	City's general fund
<b>Increase capabilities to provide mass notifications to the public and increase coordination among city departments during times of severe weather.</b>													
Expand, maintain, upgrade, and modernize city wide Tornado Siren network.	2015	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	High	Existing	Office of Emergency Preparedness 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		Medium - High	City's General Fund, Grants, or other future sources

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
Purchase Mass Notification System to better inform residents and city employees during severe weather.	2015	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	Work with other City departments through local ordinances 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.		Medium	City's General Fund, Grants, or other future sources
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>													
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Implemented through the City's preparedness educational and outreach program with emphasis on existing shelter facilities located throughout the City		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low/no cost mechanism to increase public safety.		Low	City's General Fund
Partner w/ trade orgs. to conduct safe room workshops.	2010	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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low/no cost mechanism to increase public safety.		Low	City's General Fund
<b>Floods</b>													
<b>Enhance public awareness and education efforts related to flooding.</b>													
Encourage home owners and businesses to purchase flood insurance.	2020	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 Office of Emergency Preparedness has several outreach programs to encourage home owners and businesses to purchase flood insurance.	Public Education	Medium	New and Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to encourage flood preparedness.		Low	City general funds and EMPG program grant monies



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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 City's Office of Emergency Preparedness, 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. 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	Medium	New and Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to encourage flood preparedness.		Low	City general funds and EMPG program grant funding
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 City's Office of Emergency preparedness, 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 such as Safety City and Echo- Fest put on by the City each year.		Medium	New and Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to encourage flood preparedness.		Low	City general funds and EMPG program grant monies
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>													
**As funding allows, target repetitive flood loss properties and structures for buyout.	2020	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		High	Unknown
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	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		High	City General Funds and Stormwater Sales Tax

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**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	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 Ordinances	Emergency preparedness	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties		Low	City's 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.	2020	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		Low	City General Funds and Stormwater Sales Tax
<b>Implement or improve flood warning systems.</b>													
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	Office of Emergency Preparedness, Water Pollution Control and Public Works Department functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.		Medium	General Funds and EMPG grants
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	Office of Emergency Preparedness, Water Pollution Control and Public Works Department functions within City ordinances and codes	Water Pollution Control and Office of Emergency Preparedness	Unknown	Will ensure that citizens are prepared real time for flood events.		Low	General Funds and EMPG grants
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	Office of Emergency Preparedness, Water Pollution Control and Public Works Department functions within City ordinances and codes	Water Pollution Control and Office of Emergency Preparedness	Ongoing	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.		Low	General Funds and EMPG grants
<b>Improve flood hazard assessments and flood mapping.</b>													
**Comprehensive Watershed Analysis and Flooplain 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 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.		Medium	City's General Funds/USACE/ other federal funds

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**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 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 ordinances 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.		Low	City's General Funds
**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 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 ordinances 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.		Low	City's General Funds
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing	Although flood hazard areas of the City have been mapped since 2004 with current FEMA flood map and the digital data integrated into city geo-data on a regular basis. The City continues to review flood hazard areas and incorporate necessary changes as needed.	Planning strategy to keep new developments or redevelopment out of floodplains	Medium	New and Existing Areas	City departmental functions within City ordinances 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.		Low	City's General Funds
**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 ordinances 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.		Low	City's General Funds
<b>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.</b>													
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	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.	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		High	City general funds and/or grant funding



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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.	2020	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	High	New	Storm water and Community Development Plans	Water Pollution Control	Ongoing	Will prevent flooding for moderate costs		Medium	Unknown
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 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.	Planning Strategies	High	Existing	City departmental functions within City ordinances and codes	Water Pollution Control and Public Works Department and Office of Emergency Preparedness	On-going	Low/no cost mechanism to increase public safety.		Low	Stormwater Sales Tax funds & Regional Detention funds

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Engage both public and private stakeholders in flood control projects to encourage mutually beneficial activities to promote flood control with other stakeholder goals.	2020	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		Water Pollution Control	Ongoing	Low		Low	Stormwater Sales Tax funds & Regional Detention funds
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	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.	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		Low	City general funds and/or grant funding
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 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.	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		High	Unknown

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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 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 volunteer groups. For instance, the Boy Scouts installed butterfly moats within the Elm Street detention basin. This volunteer effort helped establish and improve ecosystem infrastructure to encourage butterfly inhabitation. The City continues to find opportunities with volunteer organizations to promote wildlife habitats.	Planning Strategies	Medium	Existing	Office of Emergency Preparedness function within City ordinances and codes	Water Pollution Control and Public Works Departments	Ongoing	Natural riparian corridors restored and preserved result in improved water quality.		Low	Stormwater Sales Tax funds & Regional Detention funds
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</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. Current flood maps are dated May 2013	Floodplain Management	High	New and Existing	Office of Emergency Preparedness and Public Works Department functions within City ordinances 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 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	Office of Emergency Preparedness and Public Works Department functions within City ordinances and codes	Public Works Department and Office of Emergency Preparedness	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.		Low	City General Funds
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>													
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	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 Ordinances	Public Works	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage		High	City general funds and/or grant funding
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2020	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	Structural and Non-Structural Flood Mitigation	Med	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordinances 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		High	Private Sector and City general funds and/or grant funding

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Elevate public facilities, commercial businesses, and residential structures to reduce flood risk.	2020	Ongoing	The City is a participating community in the National Flood Insurance Program (NFIP). New development 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.	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).		Low	Public/private partnering
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2020	Ongoing	The City's Water Pollution Control Department and Office of Emergency Preparedness works with property owners and other stakeholders to develop and implement flood mitigation strategies which promotes protection of these items	Elevation of Mechanical Systems/Risk Mitigation	High	Existing	City departmental functions within City ordinances and codes	Water Pollution Control and Office of Emergency Preparedness	Ongoing	Low/no cost mechanism to increase public safety and reduce high cost flood damages		Low	City general funds and/or grant funding
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 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 ordinances 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		High	City general funds and/or grant 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 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 ordinances 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		Medium	City general funds and/or grant funding
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2020	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.	Structural and Non-Structural Flood Mitigation	High	Existing	Emergency Preparedness, Public works and Water Pollution Control function within Code of Ordinances and as Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Public works and Office of Emergency preparedness	Ongoing	Initial high cost but prevents future flooding of properties that have had history of high cost flood damage		High	Private Sector and City general funds and/or grant funding

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Identify storm sewer and waste water systems to identify and upgrade areas where infrastructure needs repair, replacement, or upgrade	2020	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.	System Upgrades and Rehabilitation	High	Existing	Emergency Preparedness, Public Works and Water Pollution Control function within Code of Ordinances and as Regulated through the adoption of NFIP CRS programs (October 1991) and IBC 2018 codes (January 2019)	Public Works, Water Pollution Control, Office of Emergency Preparedness	Ongoing	High cost of repair, but can result in extremely high flood losses if there is a system failure or overload		High	Stormwater Sales Tax and sanitary sewer fee/rates
<b>Work with partner agencies to implement flood inundation prediction capability.</b>													
**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	Office of Emergency Preparedness function within City ordinances and codes	Water Pollution Control and Office of Emergency Preparedness	Unknown	Will ensure that citizens are prepared real time for flood events.		Medium	Unknown
<b>Severe Winter Weather</b>													
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of severe winter weather.</b>													
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	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.		High	Existing	Power & Light function within City ordinances and codes	City's Power and Light Department	On-going	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.		High	City's General Funds and HMGP monies
Budget for the incremental replacement of existing above-ground utility lines with underground utility lines.	2010	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.		High	Existing	Power & Light function within City ordinances and codes	City's Power and Light Department	On-going	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.		Medium	City's General Funds and HMGP monies
Offer incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	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.		High	Existing	Power & Light function within City ordinances and codes	City's Power and Light Department	On-going	Would reduce recovery costs, but would have high initial implementation.		High	City's General Funds and HMGP monies
<b>Enhance public awareness of severe winter weather mitigation and preparedness activities.</b>													

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Collect and disseminate public education materials that address winter weather safety, preparedness and mitigation activities.	2010	Ongoing	The City'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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to increase public safety.		Low	City's General Funds
Develop and conduct a public education and awareness campaign on properly winterizing homes.	2010	Ongoing	The City'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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to increase public safety.		Low	City's General Funds and EMPG monies
Partner with emergency services, public health and community groups to conduct special public education events, such as a Severe Winter Weather Awareness Day.	2010	Ongoing	The City'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 City 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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to increase public safety.		Low	City's General Funds
Provide vulnerable populations with winter weather safety, preparedness and mitigation information.	2010	Ongoing	The City'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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	On-going	No/low cost mechanism to increase public safety.		Low	City's General Funds and EMPG monies
<b>Ensure at-risk, low income and elderly residents have adequate heat in their homes.</b>													
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.	2010	Ongoing	Although the City does not have a program in place to assist at-risk groups to winterize their homes. The city does promote its Citizen Corps volunteers to work with other private organizations involved in these type programs.		Med	Existing	Office of Emergency Preparedness within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to support vulnerable populations access to heating to prevent death/injury from exposure to winter storms.		Low	General Funds and EMPG grants



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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.	2010	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.		High	Existing	Power & Light function within City ordinances 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.		High	City's General Funds and grants
<b>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>													
Consider the adoption of policy A77:P77s requiring generators or other emergency power systems in the construction of new public facilities.	2010	Ongoing	The City has policies in place for generators required in "Safe Room" applications. The City is also working with MARC to obtain funding to pre-wire Red Cross identified shelters for generators through UASI Mass Care initiatives. The City's Office of Emergency Preparedness has an on-going program to develop relationships with potential shelters located throughout the City to pre-wire or purchase generators for their facilities		High		Office of Emergency Preparedness, Water Pollution Control and Public Works Department functions within City ordinances and codes	Public Works, Office of Emergency preparedness	Ongoing	Fairly high cost program to implement, but would help ensure continuity of government operations.		Medium	City's General Fund, Grants, or other future sources
Retrofit otherwise suitable existing facilities with generators for emergency power.	2010	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.		High	Existing	Office of Emergency Preparedness functions within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Fairly high cost installation price but will ensure continuity of shelter operations.		Medium	City's General Fund, Grants, or other future sources
<b>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</b>													
Budget for the stockpiling of sand, salt and other materials necessary to reduce or eliminate ice on roadways and improve road conditions.	2010	Ongoing	This expense is outlined in the Public Works budget on a yearly basis and funding amount is reviewed every year.		Low	New	Public Works function within Code of Ordinance	Public Works	Ongoing	Will ensure continued open roadways.		Medium	General Fund

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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	2010	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.		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.).	2010	Ongoing	The City's Public Works Department is part of a regional Public Works Mutual Aid Agreement through the MARC organization		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
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.	2010	Ongoing	The City's Public Works Department works with regional partners regarding salt and sand contracts		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
<b>Drought</b>													
<b>Assess the vulnerability of water systems.</b>													
Conduct an assessment of the vulnerability and water use demand of local water systems by utilizing the procedures in the Missouri Drought Plan.	2010	Ongoing	The City of Independence Water Department continually assess the demands on the water system and has plans in place for drought emergencies		High	Existing	Water Department function within City ordinances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Relatively low cost mechanism to inform mitigation strategies		Low	City's General Funds
<b>Encourage improvements to water system infrastructures to reduce vulnerability to drought and meet water use demands.</b>													
Budget for infrastructure improvements to municipal water systems.	2010	Ongoing	The City has implemented a Leak detection system to determine if underground water pipe infrastructures are leaking water.		High	Existing	Water Department and Water Pollution Control Department function within City ordinances and codes	City's Water Department	On-going	Targeted and phased improvements will improve efficiency and reduce future recovery and replacement costs.		High	City's General Funds
Identify and apply for state and federal grants to improve water treatment plants, transmission systems, water mains and related infrastructure.	2010	Ongoing	The City consistently continues to apply for State and Federal grants for water system infrastructure improvements		High	New	Water Department and Water Pollution Control Department function within City ordinances and codes	City's Water Department	On-going	High cost mechanism to implement but greatly increases water conservation measures.		High	City's General Fund, Grants, or other future sources
<b>Encourage water conservation efforts by commercial, industrial and private water users.</b>													
Develop and implement a program to encourage voluntary water conservation.	2010	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.		Medium	Existing	Water Department and Water Pollution Control Department function within City ordinances and codes	City's Water Department	On-going	Low cost mechanism to increase support water conservation measures.		Low	City's General Funds
<b>Enhance public awareness of drought, drought mitigation, state and local drought response actions and water conservation measures.</b>													



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Develop and conduct public education and awareness programs on drought mitigation, drought response and water conservation.	2010	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.		Medium	New	Water Department function within City ordinances and codes	City's Water Department	On-going	Low cost mechanism to support drought response.		Low	City's General Funds
<b>Ensure plans and procedures addressing local drought response, drought mitigation and long-term water planning are developed.</b>													
Develop local procedures implementing the provisions of the Missouri Drought Plan.	2010	Ongoing	City is constantly utilizing local, state and federal programs and guidance regarding long term planning				Water Department function within City ordinances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.		Low	City's General Funds
Review the Missouri Drought Plan, as well as local drought plans available from MDNR, and develop a local drought plan.	2010	Ongoing	City is constantly utilizing local, state and federal programs and guidance regarding long term planning		High		Water Department function within City ordinances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.		Low	City's General Funds
Working with MARC, develop drought plans and water conservation programs.	2010	Ongoing	City is utilizing local programs and guidance and coordinates with MARC regarding water drought and conservation programs in local plans				Water Department function within City ordinances and codes along with procedures in Missouri Drought Plan	Independence Water Department	Ongoing	Low cost mechanism to support drought response.		Low	City's General Funds
<b>Heat Waves</b>													
<b>Enhance public awareness of the hazards associated with heat waves, precautionary measures and area heat wave mitigation and preparedness activities.</b>													
Collect and disseminate public education materials that address heat wave safety, preparedness and mitigation activities.	2010	Ongoing	The City'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. 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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds

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Develop and conduct a public education and awareness campaign on properly weather stripping homes.	2010	Ongoing	The City'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. 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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness and Power and Light Department	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds
Provide vulnerable populations with public education materials that address heat wave safety, preparedness and mitigation activities.	2010	Ongoing	The City'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. 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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds
Work with the media to publish special newspaper sections or conduct periodic broadcasts with emergency information on extreme heat.	2010	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 Office of Emergency Preparedness 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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Management	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds
<b>Ensure at-risk, low income and elderly residents have adequate air conditioning (or fans) and ventilation in their homes.</b>													

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Identify at-risk, low income and elderly residents and develop a database and map (or GIS layers) of their places of residence.	2010	Ongoing	The office of Emergency Preparedness is currently exploring ways to get at-risk populations into a GIS database. One option is to use a Mass Notification service such as Everbridge or Regroup.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Medium cost method to identify at-risk populations to prevent injury of death		Medium	City's General Fund, Grants, or other future sources
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.	2010	Ongoing	The City's Office of Emergency Preparedness 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"		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to support resiliency for vulnerable populations during heat waves.		Low	City's General Fund
<b>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.</b>													
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.	2010	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 sever heat waves.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to identify mitigation strategies for populations vulnerable to heat waves.		Low	City's General Fund
Retrofit otherwise suitable existing facilities with air conditioning systems and designate them as shelters for use during heat waves.	2010	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.		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	City's General Fund, Grants, or other future sources
<b>Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.</b>													
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.		High	Existing	Office of Emergency Preparedness function within City ordinances and codes	Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	EMPG and City's 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.	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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds

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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.		High	Existing	Office of Emergency Preparedness, City Health Department function within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds
<b>Dam Failures</b>													
<b>Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities.</b>													
Collect and disseminate public education materials that address dam safety, preparedness and mitigation activities.	2010	Ongoing	The City'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.		High	Existing	Office of Emergency Preparedness, within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's 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 City'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. The City has two potential large dams that would affect our population should it fail.		High	Existing	Office of Emergency Preparedness, within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's 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 City'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.		High	Existing	Office of Emergency Preparedness, within City ordinances and codes	Office of Emergency Preparedness	On-going	Low cost mechanism to increase public safety.		Low	City's General Funds
<b>Levee Failures</b>													
<b>Improve response planning for Levee Failure</b>													
Work with the water department to ensure the levees surrounding the water plant are adequate and properly maintained.	2015	Ongoing		Local Plans and Regulations	High	New & Existing	EOP	Office of Emergency Preparedness	Ongoing	Low cost mechanism to increase public safety.		Low	City's General Funds

<b>Lee's Summit 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of approved materials that reduce the damaging effects of tornadoes and high wind events.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2020	Ongoing	2018 International codes were adopted in 2019.	Unspecified	Unspecified	Every three years	A guide for the safe construction of the built environment.	development dept	2500	General Fund
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	TBD	Provide emergency shelter for the occupants of structures without basements.	development dept	Varies	Private/Grants for Public Projects
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		development dept	TBD	TBD
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2015	Ongoing		Structure and Infrastructure Projects	Low	TBD	Provide emergency shelter for the occupants of structures without basements.	public works	TBD	General Fund/Public Grants
<b>Encourage the construction of safe rooms and tornado shelters in public and private buildings.</b>										
Work with chambers of commerce, school districts, corporations, homeowners, developers etc. to promote benefits of safe rooms and community shelters.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	TBD	emergency management	Unknown	Private/Grants for Public Projects
<b>Evaluate warning systems in the City.</b>										
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.	Unspecified	Unspecified	Ongoing	Find cost effective warning systems to enhance mass notification.	emergency management	TBD	General Fund/Public Grants
<b>Increase public awareness of severe weather notification systems available within the City.</b>										



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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.	Unspecified	Unspecified	Ongoing		emergency management	TBD	General Fund
<b>Update the Local Emergency Operating Plan</b>										
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	Unspecified	Unspecified	18 months, process began in 2019	TBD	emergency management	TBD	General Fund
<b>Floods</b>										
<b>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.</b>										
In concert with existing comprehensive and land use plans, acquire flood-prone property for use as open space or park land.	2015	Ongoing		Natural Systems Protection	Medium	Ongoing		development dept	TBD	TBD
Require storm water studies to determine the need for 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.	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Minimizes the impact of flooding downstream from new development	development dept	TBD	Private
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Unspecified	Unspecified	Ongoing		development dept		

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**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		Unspecified	Unspecified	Ongoing		development dept		
**Enforce ordinances and comprehensive development plans that prohibit residential and commercial development in flood plains or flood-prone areas. Maintain updated FEMA Flood Plain maps.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	unknown	development dept		Private
**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		Unspecified	Unspecified	Ongoing		development dept		
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Unspecified	Unspecified			emergency management		
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		Unspecified	Unspecified			emergency management		
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		Unspecified	Unspecified			emergency management		
<b>Examine feasibility of permanent flood barricades for roadways that experience recurring flooding.</b>										
Determine the roadways that are prone to flooding and examine the cost to benefit ratio for installing permanent flood barricades. Consider applying for FEMA's Pre-Disaster Mitigation Grant to aid in costs.	2020	Ongoing		Unspecified	Unspecified	TBD	General Fund	public works		
<b>Examine repetitive flood loss properties and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2015	Ongoing		Structure and Infrastructure Projects	Low	Ongoing		floodplain manager	TBD	General Fund/Bonds/Grants

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**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2015	Ongoing		Unspecified	Unspecified			floodplain manager		
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2015	Ongoing		Unspecified	Unspecified			floodplain manager		
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options.	2015	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Determine when it is in the best interest of the City and property owner to remove structures or provide features to protect the property from flooding.	floodplain manager	TBD	General Fund/Public Grants/Bonds/Capital Improvement Projects
<b>Implement or improve flood warning systems.</b>										
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		Unspecified	Unspecified			public works		
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	Unspecified			emergency management		
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Unspecified	Unspecified			emergency management		
<b>Improve flood hazard assessments and flood mapping.</b>										
**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		Unspecified	Unspecified			development dept		
**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		Unspecified	Unspecified			development dept		
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	Unspecified			development dept		



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**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	Unspecified			development dept		
**Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Ongoing		Unspecified	Unspecified			development dept		
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Unspecified	Unspecified			development dept parks & recreation		
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		Unspecified	Unspecified			development dept parks & recreation		
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		Unspecified	Unspecified			development dept parks & recreation		
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Unspecified	Unspecified			development dept parks & recreation		
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	Unspecified			development dept parks & recreation		
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		Unspecified	Unspecified			development dept parks & recreation		
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2015	Ongoing		Unspecified	Unspecified			floodplain manager		

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**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2015	Ongoing		Unspecified	Unspecified			floodplain manager		
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Unspecified			floodplain manager		
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Unspecified	Unspecified			floodplain manager		
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems(i.e., furnaces, hot water heaters, electrical panels, etc.).	2015	Ongoing		Education and Awareness Programs	Low	Ongoing	Minimize the cost of flooding by removing equipment that may be damaged.	floodplain manager	TBD	Private
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	Unspecified			floodplain manager		
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		Unspecified	Unspecified			floodplain manager		
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Unspecified	Unspecified			development dept		
Water Utilities is assessing their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	unknown	water utilities	TBD	Enterprise Fund/Bonds/Capital Improvement Projects
<b>Severe Winter Weather</b>										
<b>Continue to review, revise, and enhance snow and debris removal plan each year.</b>										
Evaluation of Automated Bridge De-icing systems.	2020	Ongoing	Consider options to mitigate risk on elevated roadways.	Structure and Infrastructure Projects	Medium	TBD		public works	TBD	
Examine possibility of limits on street parking during snow removal operations.	2020	Ongoing	Consideration of strategies to be considered during review process.	Local Plans and Regulations	Medium	Annually		public works	TBD	
<b>Heat</b>										
<b>Ensure Water storage capacity can meet service demands during times of excessive water usage, during drought and high temperature periods.</b>										

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
Maintain agreements with near by water districts that we interconnect with, allowing opportunities to gain access to additional drinking water supplies.	2020	Ongoing		Local Plans and Regulations	Medium	annual agreement review		water utilities	TBD	

**Oak Grove 2020 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
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**Tornadoes and Severe Thunderstorms**

**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	High	Continuous Project		building code official	Undetermined	General Revenue, EMPG
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	Continuous Project	Local Plans and Regulations	High	Continuous Project		building code official	Undetermined	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	High	Continuous Project		building code official	Undetermined	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	Local Plans and Regulations	Medium	Continuous Project		emergency management	Undetermined	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		planning	Undetermined	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		emergency management	Undetermined	General Revenue, FEMA Shelter Grant, EMPG

**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		planning	Undetermined	General Revenue, EMPG
Urge electric utilities to anchor or strengthen above-ground transmission lines, poles and similar structures.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		planning	Undetermined	General Revenue, EMPG
Urge utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		planning	Undetermined	General Revenue, EMPG

**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	Continuous Project		public works	Undetermined	General Revenue, EMPG
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		emergency management	Undetermined	General Revenue, EMPG

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
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	Ongoing	Continuous Project	Education and Awareness Programs	Medium	Continuous Project		public works	Undetermined	General Revenue, FEMA Shelter Grant, HMGP
<b>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.</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
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 management	Unknown	General Revenue, EMPG
<b>Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.</b>										
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.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		emergency management	Unknown	General Revenue and EMPG
<b>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.</b>										
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	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
<b>Increase the capability for local government facilities to provide emergency electric power in case of long-term, weather related power failure.</b>										
Install and maintain whole building backup electric power capability for local government infrastructure.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous project,		planning	Undetermined	General Revenue, EMPG, HMGP
<b>Enhance public awareness and education efforts related to flooding.</b>										

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
Encourage home owners and businesses to purchase flood insurance.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		floodplain manager	Undetermined	General Revenue, EMPG
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		floodplain manager	Undetermined	General Revenue, EMPG
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		floodplain manager	Undetermined	General Revenue, EMPG
**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	Continuous Project	Local Plans and Regulations	High	Continuous Project		floodplain manager	Undetermined	General Revenue, EMPG
<b>Implement or improve flood warning systems.</b>										
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, EMPG, HM, NWS, USACE
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		public works	Undetermined	General Revenue, EMPG, HM, NWS, USACE



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
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.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG, HM, NWS, USACE
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project			Undetermined	General Revenue, EMPG
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2020	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project			Undetermined	General Revenue, EMPG
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		planning	Undetermined	General Revenue, EMPG
**Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		planning	Undetermined	General Revenue, EMPG
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2020	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project			Undetermined	General Revenue, EMPG
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		planning	Undetermined	General Revenue, EMPG, HMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		planning	Undetermined	General Revenue, EMPG, HMPG

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
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.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG, HMPG
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, EMPG, HMPG
In concert with existing comprehensive and land use plans, develop a strategy for acquiring flood-prone property for use as green space or park land.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		planning	Undetermined	General Revenue, EMPG, HMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		planning	Undetermined	General Revenue, EMPG, HMPG
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, EMPG
<b>Plan for flash flooding from upstream dam failure.</b>										
Conduct dam failure inundation studies using Dam Emergency Plans available from Missouri Department of Natural Resources	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		public work	Undetermined	General Revenue, EMPG
<b>Provide reduced flash flooding due to stormwater runoff.</b>										
Conduct a program of inspections for infiltration and inflow of surface water and other stormwater into the sanitary sewer system and consult corrective actions.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	Sewer System Enterprise Fund
Conduct a public education program to educate the public to not discharge water from downspouts and sump pumps into the sanitary sewer system .	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		public works	Unknown	General Revenue and EMPG
Provide greater oversight of new development and construction through development regulations.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		planning	Undetermined	General Revenue, EMPG, HM, NWS, USACE
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, EMPG, HMPG



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
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG, HMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG, HMPG
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG, HMPG
<b>Severe Thunderstorms</b>										
<b>Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.</b>										
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.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		emergency management	Unknown	General Revenue and EMPG
<b>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.</b>										
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	Unspecified	Continuous project		emergency management	Unknown	General revenue, EMPG, HMGP
<b>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.</b>										
Obtain enhanced weather information systems and incorporate them into operational plans	2020	Ongoing	Continuous project.	Structure and Infrastructure Projects	High	Continuous project		emergency management	Unknown	General revenue, EMPG, HMGP
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	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Undetermined	General Revenue, EMPG
<b>Heat</b>										
<b>Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events.</b>										

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
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	Continuous project.	Local Plans and Regulations	High	Continuous project.		public works	Unknown	General Revenue and EMPG
<b>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.</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous project.	Structure and Infrastructure Projects	High	Continuous project.		emergency management	Unknown	General Revenue and EMPG
<b>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.</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous project.	Education and Awareness Programs	High	Continuous project.		emergency management	Unknown	General Revenue and EMPG
<b>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.</b>										
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.		emergency management	Unknown	General Revenue and EMPG
<b>Severe Winter Weather</b>										
<b>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.</b>										
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.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Unknown	General Revenue and EMPG
<b>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.</b>										
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.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		emergency management	Unknown	General Revenue and EMPG
<b>Increase public awareness of the hazards and safety actions for severe winter weather through public education.</b>										

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
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.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		emergency management	Unknown	General Revenue and EMPG
<b>Increase the capability to remove snow and ice from streets and highways and otherwise respond to severe winter weather.</b>										
Through building development regulations, plan for areas that snow can be pushed to without blocking mailboxes, fire hydrants, and driveways.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		public works	Unknown	General Revenue and EMPG
<b>Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure.</b>										
Install and maintain whole building backup electric power capability for local government infrastructure.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
<b>Increase the capability to shelter persons stranded by closing of Interstate Highways due the severe winter weather.</b>										
Install and maintain whole building backup electric power capability for local government buildings, suitable as shelters	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		public works	Undetermined	General Revenue, HMGP

<b>Raytown 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
Mitigation Goals and Action Steps for 2020 Plan	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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
b. Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Deferred	No initiatives at this time							
c. Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Deferred	No initiatives at this time							
d. 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	Deferred	No initiatives at this time							
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
a. Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Deferred	No initiatives at this time							
b. Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Deferred	The City's Office of Emergency Management has an ongoing program to educate the public about "All hazards" preparedness and safety through MARC regional initiatives. This program includes standardized educational materials that address the hazards of tornadoes and safe rooms.		Medium	Ongoing	No/low cost mechanism to increase public safety.		Low	Unknown

c. Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred	No initiatives at this time							
<b>Enhance public awareness of tornado mitigation and preparedness activities.</b>										
Increase public awareness of actions that residents can take to prepare for tornadoes. Use social media to educate residents about tornado preparedness.	2020	Ongoing	Continuous Project	Education and Awareness Program	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
Increase public awareness of imminent threat of tornado. Add Nixle as a means to broadcast tornado watches and warnings.	2020	Ongoing	Continuous Project	Notifications	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Deferred	The City continues to review these shelters on a regular basis assuring their operational readiness		Medium	Ongoing	No/low cost mechanism to increase public safety.		Low	Unknown
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred	City continues to retrofit shelters as funding opportunities and facilities become available		Medium	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	Unknown
<b>Examine alternative methods of notification / awareness for citizens e.g. reverse 911, social media</b>										
Examine alt methods of public warning systems for all hazards	2015	Deferred	Review implementation of alternate warning systems including reverse 911 and social media	Education and Awareness Programs	Medium	ongoing	Medium cost to implement technology but can have large public safety benefits		Medium	Unknown
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										

Develop, distribute informational materials on safe rooms.	2010	Deferred	Emergency Management has an ongoing program to educate the public about "All hazards" preparedness and safety through MARC regional initiatives. This program includes standardized educational materials that address the hazards of tornados and safe rooms.		Low	Ongoing	No/low cost mechanism to increase public safety.		Low	City general funds and EMPG monies
<b>Severe Thunderstorms</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
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	Deferred			Low	Ongoing	Will reduce vulnerabilities to flood.		Low	Unknown
<b>Enhance public awareness of severe thunderstorm mitigation and preparedness activities.</b>										
Increase public awareness of actions that residents can take to prepare for severe thunderstorms. Use social media to educate residents about severe thunderstorm preparedness.	2020	Ongoing	Continuous Project	Education and Awareness Program	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
Increase public awareness of imminent threat of severe thunderstorms. Add Nixle as a means to broadcast severe thunderstorm watches and warnings.	2020	Ongoing	Continuous Project	Notifications	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
Increase public awareness of the danger of flash floods. Use social media to educate residents about the danger of flash floods.	2020	Ongoing	Continuous Project	Education and Awareness Program	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
Increase public awareness of imminent threat of flash floods. Add Nixle as a means to broadcast flash flood watches and warnings.	2020	Ongoing	Continuous Project	Notifications	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue

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	Deferred	The City's Office of Emergency Management has ongoing programs to educate the public and businesses about "All hazards" preparedness and safety through MARC regional initiatives. This program includes standardized educational materials that address the hazards of flooding.		Medium	Ongoing	No/low cost mechanism to increase public safety.		Low	Unknown
<b>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.</b>										
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	Deferred	City continues to review construction of storm water protection systems on a regular basis		Low	Ongoing	Will prevent flooding for moderate costs		Medium	Unknown
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing	Continuous Project	Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing	Continuous Project	Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</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.	2010	Deferred	City continues to review vulnerabilities to these type of systems		Low	Ongoing	While may increase building, maintenance and development costs, will reduce significant flood impacts		High	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.	2010	Deferred	City continues to review vulnerabilities to these type of systems and look for opportunities to retrofit		Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs from flooding events		High	Unknown
<b>Severe Winter Weather</b>										
<b>Enhance public awareness of severe winter weather mitigation and preparedness activities.</b>										



b. Collect and disseminate public education materials that address winter weather safety, preparedness and mitigation activities.	2010	Deferred	The City's Office of Emergency Management has ongoing programs to educate the public and businesses about "All hazards" preparedness and safety through MARC regional initiatives. This program includes		Low	ongoing	No/low cost mechanism to increase public safety.		Low	Unknown
Increase public awareness of the danger of severe winter weather. Use social media to educate residents about the danger of severe winter weather	2020	Ongoing	Continuous Project	Education and Awareness Program	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
Increase public awareness of imminent threat of severe winter weather. Add Nixle as a means to broadcast severe winter weather-related watches and warnings.	2020	Ongoing	Continuous Project	Notifications	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
<b>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>										
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.	2010	Deferred	City works with regional partners regarding shelter operations and associated resources		Medium	ongoing	No/low cost mechanism to increase public safety.		Low	Unknown
<b>Heat</b>										
<b>Enhance public awareness of excessive heat conditions mitigation and preparedness activities.</b>										
Increase public awareness of the danger of excessive heat conditions. Use social media to educate residents about the danger of excessive heat conditions.	2020	Ongoing	Continuous Project	Education and Awareness Program	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
Increase public awareness of imminent threat of excessive heat conditions. Add Nixle as a means to broadcast excessive heat-related watches and warnings.	2020	Ongoing	Continuous Project	Notifications	High	Continuous Project	low cost mechanism to increase public safety	emergency management	Unknown	General Revenue
<b>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.</b>										



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.	2010	Deferred	The City works with several local and regional stakeholders to ensure the City residents have access to "Cooling Centers" available to the public during times of severe heat waves.		Low	ongoing	Low cost mechanism to reduce injuries and death from heat related hazards		Low	Unknown
<b>3. Ensure programs and procedures to mitigate, prepare for and respond to heat waves are developed and implemented.</b>										
Consider developing a regional heat emergency plan for the greater Kansas City metropolitan area.	2010	Deferred	City works with regional partners regarding the regional heat emergency plan		Medium	12-31-10	Low cost mechanism to reduce injuries and death from heat related hazards		Low	Unknown
Develop local heat emergency plans or heat wave annexes to local emergency operations plans.	2010	Deferred	City in the process of informational review for development of this annex to the EOP							
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	Deferred	The City coordinates with regional public and private agencies to check on at-risk populations. This is an on-going program continually identifying additional partners such as CERT, VIPS and faith based organizations.		Medium	12-31-10	Low cost mechanism to reduce injuries and death from heat related hazards		Low	Unknown

<b>Central Jackson County Fire Protection District 2020 Mitigation Strategy (New Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2020	Ongoing		Structure and Infrastructure Projects	medium	ongoing		fire district		
Construct safe rooms or shelters in public facilities	2020	Ongoing		Structure and Infrastructure Projects	medium	ongoing		city and fire district		FEMA grant and EM budget
<b>Ensure Alert, Warning and Mass Notification systems are in place and operational.</b>										
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		fire district		FEMA grant and EM budget

<b>Sni Valley Fire Protection District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes &amp; Severe Thunderstorms</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	High	Continuous Project	Undetermined	city	General Revenue, EMPG	General Revenue, EMPG
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	Continuous Project	Local Plans and Regulations	High	Continuous Project		city	Undetermined	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	High	Continuous Project		city	Undetermined	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	Local Plans and Regulations	Medium	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Encourage construction of community tornado shelters in office complexes, factories, apartment complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
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		city	Undetermined	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		fire district	Undetermined	General Revenue, FEMA Shelter Grant, EMPG
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Require that utility lines in new construction be underground.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		city	Undetermined	General Revenue, EMPG
Urge electric utilities to anchor or strengthen above-ground transmission lines, poles and similar structures.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
Urge utility providers to replace existing above-ground utility lines with underground utility lines.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Ensure public facilities have shelters and emergency plans to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2020	Ongoing	Continuous Project	Local Plans and Regulations	Medium	Continuous Project		city	Undetermined	General Revenue, EMPG

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		fire district	Undetermined	General Revenue, EMPG
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2020	Ongoing	Continuous Project	Education and Awareness Programs	Medium	Continuous Project		city	Undetermined	General Revenue, FEMA Shelter Grant, HMGP
<b>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.</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
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		fire district	Unknown	General Revenue and EMPG
<b>Increase public awareness of family and individual preparedness actions they can take to prepare for tornadoes and severe storms through public education activities.</b>										
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.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		fire district	Unknown	General Revenue and EMPG
<b>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.</b>										
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	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure.</b>										
Install and maintain whole building backup electric power capability for local government infrastructure.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		city	Undetermined	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		city	Undetermined	General Revenue, EMPG

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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project			Undetermined	General Revenue, EMPG
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2020	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project			Undetermined	General Revenue, EMPG
Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Undetermined	city	General Revenue, EMPG	General Revenue, EMPG
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project	Undetermined	city	General Revenue, EMPG	General Revenue, EMPG
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2020	Deferred	HAZUS requires latest version of ArcGIS Software at \$1500 per copy and investment of significant skilled staff time.	Local Plans and Regulations	High	Continuous Project	Undetermined		General Revenue, EMPG	General Revenue, EMPG, HMPG
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		city	Undetermined	General Revenue, EMPG

<b>Implement or improve flood warning systems.</b>										
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	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG, HM, NWS, USACE
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG, HM, NWS, USACE
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.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG, HM, NWS, USACE
<b>Plan for flash flooding from upstream dam failure.</b>										
Conduct dam failure inundation studies using Dam Emergency Plans available from Missouri Department of Natural Resources	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Undetermined	General Revenue, EMPG
<b>Severe Winter Weather</b>										
<b>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</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		fire district	Unknown	General Revenue and EMPG
<b>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.</b>										
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.	2020	Ongoing	Continuous Project	Local Plans and Regulations	High	Continuous Project		fire district	Unknown	General Revenue and EMPG
<b>Increase public awareness of the hazards and safety actions for severe winter weather through public education.</b>										
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.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		fire district	Unknown	General Revenue and EMPG
<b>Increase the capability to for local government facilities to provide emergency electric power in case of long-term, weather related power failure</b>										

Install and maintain whole building backup electric power capability for local government infrastructure.	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		city	Undetermined	General Revenue, Water Enterprise Fund, Sewer Enterprise Fund, HMGP
<b>Increase the capability to shelter persons stranded by closing of Interstate Highways due the severe winter weather</b>										
Install and maintain whole building backup electric power capability for local government buildings, suitable as shelters	2020	Ongoing	Continuous Project	Structure and Infrastructure Projects	High	Continuous Project		city	Undetermined	General Revenue, HMGP
<b>Heat</b>										
<b>Incorporate Wet Bulb Global Temperature Heat Index into plans for excessive heat events.</b>										
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	Continuous Project	Local Plans and Regulations	High	Continuous Project		city	Unknown	General Revenue and EMPG
<b>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.</b>										
Conduct public information campaigns for NOAA All-Hazards Radio, IPAWS, Indoor Pager Systems, Social Media, Mobile Phone apps, text-email alerting, reverse 911 and other emergency information technologies.	2020	Ongoing	Continuous Project	Education and Awareness Programs	High	Continuous Project		fire district	Unknown	General Revenue and EMPG
<b>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.</b>										
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	Education and Awareness Programs	High	Continuous Project		fire district	Unknown	General Revenue and EMPG



<b>Platte County 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.		0	NA
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	Deferred	Currently the county is considering the adoption of safe rooms to the Planning and Zoning ordinance	Unspecified	Unspecified					
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	Unspecified	Medium	Ongoing	While may increase building costs, will lead to greater occupant safety		0	NA
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.	Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.		0	NA
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
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	Unspecified	Unspecified					
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.	Unspecified	Unspecified					



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
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.	Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.		Unknown	FEMA Grants
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
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.	Unspecified	Unspecified					
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing	Currently being done by all.	Unspecified	Unspecified					
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred	Not at this time.	Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
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.	Unspecified	Unspecified					
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred	Not a High priority at this time.	Unspecified	Unspecified					
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.	Unspecified	Unspecified					
<b>Evaluate the county to continue to add more warning sirens in locations of the greatest need</b>										
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.		21000	budget
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	Materials are made available for the public and contractors to gather information.	Unspecified	High	Open	Low/no cost mechanism to increase public safety.		NA	NA
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred	Currently nothing in place.	Unspecified	Unspecified					
<b>Increase public safety alert and warning.</b>										

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
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.		30	PCA
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
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	Unspecified	High	Unknown	Will provide legal mechanism to enforce floodplain management.		Low	Unknown at this 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	Unspecified	High	Unknown	Will reduce future vulnerability to flood.		Low	Unknown at this 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	Deferred	Nothing in place at this time.	Unspecified	High	Unknown	Will provide legal mechanism to enforce floodplain management.		Unknown	Unknown at this time
<b>Enhance public awareness and education efforts related to flooding.</b>										
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.	Unspecified	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.		0	0
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.	Unspecified	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.		0	Unknown at this time

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
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.	Unspecified	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.		0	Unknown at this time
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
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.	Unspecified	High	Unknown	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.		High	CDBG 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.	Unspecified	High	Unknown	Preventing future flooding of properties that have had history of flood damage		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.	Unspecified	High	Unknown	Prevent future flooding of properties that have experienced past damage from floods		Low	Unknown at this 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.	Unspecified	High	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties		Low	CDBG or some other grant that might be available

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
<b>Implement or improve flood warning systems.</b>										
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.	Unspecified	Medium	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.		50000	Parks and Recreation
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.	Unspecified	Medium	Ongoing	Will ensure that citizens are prepared real time for flood events.		50000	Department of Public Works
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.	Unspecified	Medium	Ongoing	Sharing of data will improve county floodplain management.		50000	Department of Public Works
<b>Improve flood hazard assessments and flood mapping.</b>										
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.	Unspecified	High	Unknown	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.		Low	Unknown at this time

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
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.	Unspecified	High	Ongoing	Free program that can increase floodplain management.		Low	Unknown at this time
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred	We are currently using the FEMA Substantial Improvement/Substantial Damage Estimator (SDE) program.	Unspecified	Unspecified					
<b>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.</b>										
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	Unspecified	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.		Medium	Parks Task
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	Unspecified	High	Unknown	Will prevent flooding for moderate costs		High	Unknown at this time
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	Unspecified	High	Unknown	Low cost mechanism to improve floodplain management on local and regional levels.		Low	Unknown at this time

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
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	Unspecified	High	Unknown	No/ or low cost to implement and require little staff support.		Low	Unknown at this 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	Unspecified	High	Unknown	Will reduce floodplain vulnerability and increase city greenspace.		Low	Unknown at this 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	Unspecified	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.		Low	Unknown at this time
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
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.	Unspecified	Unspecified	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.			Unknown at this time
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										

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
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	Unspecified	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.		Unknown	Unknown at this time
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	Unspecified	High	Unknown	While initial cost is high, will reduce recovery and replacement costs.		High	Unknown at this time
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	Unspecified	High	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.		Medium	Unknown at this 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	Deferred	This will be based on utilities plans.	Unspecified	Unspecified					
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	Unspecified	Unspecified					

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
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	Unspecified	High	Unknown	Will greatly reduce and offset construction costs and limit recovery costs.		Medium	Unknown at this time



<b>Dearborn 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>													
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
<b>Tornadoes</b>													
<b>Improve and maintain warning system.</b>													
Add additional siren to the south side of town	2020	Ongoing		Structure and Infrastructure Projects	High	New	city council	city		lives saved		Medium	Unknown
Establish designated command and meeting locations (city hall or community Center)	2020	Ongoing		Structure and Infrastructure Projects	High	Existing	city council	city	2020	lives saved		Low	
Maintain existing siren near high school	2020	Ongoing		Structure and Infrastructure Projects	High	Existing	city council	city	2020	lives saved		Low	Unknown
<b>Upgrade assets to support use as temporary housing (community center and four schools).</b>													
Evaluate facilities and supplies to determine improvements and stockpile of supplies	2020	Ongoing		Structure and Infrastructure Projects	High	New	city council and school district	city	2021	lives saved	500	Low	City
<b>Floods</b>													
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>													
**d. With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2020	Ongoing		Education and Awareness	Medium	Existing			Ongoing	reduced losses			City's General fund and CIP Budget
<b>Severe Storms (Winter, Heat, Thunderstorms)</b>													
<b>Protect vulnerable populations during severe storm events, particularly those impacting the availability of electric power.</b>													
Assign neighbors to check on identified residents	2020	Ongoing		Education and Awareness	High	New	city council	city	2020			Low	
Conduct survey to identify residents that require electricity and maintain list	2020	Ongoing		Education and Awareness	High	New	city council	city	2020			Low	

<b>Farley 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase tornado preparedness.</b>										
Install tornado warning sirens.	2015	Deferred	Lack of resources	Structure and Infrastructure Projects	High	TBD as funding allows	Will provide storm alerting		Medium	Unknown
<b>To work with Platte County as much as possible as we have no paid employees only volunteers</b>										
Working with Platte County.	2020	Ongoing		Education and Awareness Programs	High	Whenever needed	No money available	Platte Co EM	No money available	No money available
<b>Floods</b>										
<b>Implement or improve flood warning systems.</b>										
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.	No money available
<b>Improve flood hazard assessments and flood mapping.</b>										
**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.	No money available
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing	Lack of resources		Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	city	TBD as available.	No money available

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 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 accurate review of floodplain management.	city	TBD as available.	No money available
<b>To work with Platte County and the Corps of Engineers as much as possible as we have no paid employees only volunteers</b>										
Working with Platte County.	2020	Ongoing	Lack of resources	Education and Awareness Programs	High	Whenever needed	No money available	Platte Co EM	No money available	No money available
<b>Severe Thunderstorms</b>										
<b>To work with Platte County as much as possible as we have no paid employees only volunteers</b>										
Working with Platte County.	2020	Ongoing		Education and Awareness Programs	Low	Whenever needed	No money available	Platte Co EM	No money available	No money available

<b>Ferrelview 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards</b>										
Retrofit or add shelters to existing public/critical facilities with inadequate protection from tornadoes and high wind, including installation of backup power.	2010	Ongoing		Unspecified	Medium	TBD as funds are available	Will better ensure safety of residents	city	High	TBD
<b>Improve tornado warning capabilities.</b>										
Install outdoor warning sirens	2015	Ongoing		Unspecified	Medium	TBD as funds are available	Will better ensure safety of residents	city	Medium	TBD
<b>Floods</b>										
<b>Improve drainage for areas prone to standing water</b>										
Re-grade ditch lines along Heady Road.	2015	Ongoing		Unspecified	High	Ongoing, as funding available	Would reduce standing water and reduce mosquito breeding areas.	city	Medium	TBD
<b>Improve flood hazard assessments and flood mapping.</b>										
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas	2010	Ongoing		Unspecified	High	ongoing	Low cost mechanism to inform flood risk.	city	Low	Operating Budget
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Unspecified	High	ongoing	Low cost mechanism to inform flood risk.	city	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	High	ongoing	Low cost mechanism to inform flood risk.	city	Low	Operating Budget

<b>Houston Lake 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	Medium	Ongoing	Initial high costs offset by potential savings in recovery costs.	local utilities	None required	None required
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	city	0	None required
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	High		Low/no cost mechanism to increase public safety.	city	None required	None required
<b>Increase public safety alert and warning.</b>										
Develop stronger local community tornado warning systems	2015	Ongoing		Education and Awareness Programs	High	2017	Low/no cost mechanism to increase public safety.	city	Low, None required	budget, None required
Increase communication with NWS for timely reporting	2015	Ongoing		Local Plans and Regulations	High	2015	Low/no cost mechanism to increase public safety.	city	None required	None required
Increase community education of weather conditions favorable for developing tornadoes.	2015	Ongoing		Education and Awareness Programs	Medium	2016	Low/no cost mechanism to increase public safety.	city	None required	FEMA
<b>Floods</b>										
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**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		Unspecified	Low	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	city	Not known	Not known
<b>Implement or improve flood warning systems.</b>										

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
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	Medium	Ongoing	Will ensure that citizens are prepared real time for flood events.	city	None required	None required
Develop stronger local community flood warning systems	2015	Ongoing		Education and Awareness Programs	Medium	2016	Low/no cost mechanism to increase public safety.	city	Minimal	city
Increase communication with NWS for timely reporting	2015	Ongoing		Local Plans and Regulations	High	2015	Low/no cost mechanism to increase public safety.	city	None required	None required
<b>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</b>										
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		Unspecified	Medium	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	city	None required	None required
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		Unspecified	Medium	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	city	None required	None required
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**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 management.	city	None required	None required
<b>Severe Thunderstorms</b>										
<b>Develop stronger local community severe thunderstorm warning system</b>										

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
Community awareness	2015	Ongoing		Education and Awareness Programs	Medium	2016	No/low cost mechanism to increase public safety.	city	Minimal	City
<b>Increase communication with NWS for timely reporting</b>										
Increased communication	2015	Ongoing		Local Plans and Regulations	High	2015	No/low cost mechanism to increase public safety.	city	None required	None required
<b>Increase community after storm damage reporting to EMD</b>										
Community awareness	2015	Ongoing		Education and Awareness Programs	High	2015	No/low cost mechanism to increase public safety.	city	Minimal	city

<b>Lake Waukomis 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Severe Thunderstorms</b>										
<b>To obtain back up power for community facilities including City Hall and sewer system.</b>										
Obtain Generator for Community Center	2015	Ongoing	funding not secured	Structure and Infrastructure Projects	Medium	by 2025	Will better ensure continuity of government operations.	city	100,000	Grants
Obtain back up power for sewer system pur	2020	Ongoing	funding not secured	Structure and Infrastructure Projects	Medium	by 2025	Will better ensure continuity of government operations.	city	100,000	Grants
<b>Floods</b>										
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	city	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	city	Low	Operating Budget



<b>Northmoor 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
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	Medium	Ongoing	While may increase building costs, will lead to greater occupant safety	city	1000	None
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	Medium	Ongoing	While may increase building costs, will lead to greater occupant safety	city	1000	None
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	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Medium	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	city	1000	None
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										

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
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Unspecified	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	city	1000	None
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	local utilities	1000	None
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.	city	1000	None
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Unspecified	Medium	ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	1000	None
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										

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
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Unspecified	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	city	1000	None
**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		Unspecified	Low	Ongoing	Will reduce future vulnerability to flood.	city	1000	None
**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		Unspecified	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	city	1000	None
<b>Enhance public awareness and education efforts related to flooding.</b>										
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		Unspecified	Low	Ongoing	No/low cost mechanism to encourage flood preparedness.	city	1000	None
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	city	1000	None
**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	city	1000	None
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing		Unspecified	Low	Ongoing	Preventing future flooding of properties that have had history of flood damage	city	1000	None

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
**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		Unspecified	Medium	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	city	1000	None
<b>Implement or improve flood warning systems.</b>										
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		Unspecified	Low	Ongoing	Stream gauges are relatively cost effective measures to warn of flooding events and implement mitigation measures.	city	1000	None
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	Low	Ongoing	Will ensure that citizens are prepared real time for flood events.	city	1000	None
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Unspecified	Low	Ongoing	Sharing of data will improve county floodplain management.	city	1000	None
<b>Improve flood hazard assessments and flood mapping.</b>										
**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		Unspecified	Low	Ongoing	Will allow for better assumptions to support mitigation activities.	city	1000	None
**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		Unspecified	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	city	1000	None

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 parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	city	1000	None
**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	Low	Ongoing	Free program that can increase floodplain management.	city	1000	None
**Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Ongoing		Unspecified	Low	Ongoing	Free program that can increase floodplain management.	city	1000	None
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Unspecified	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	city	1000	None
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		Unspecified	Low	Ongoing	Will prevent flooding for moderate costs	city	1000	None
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		Unspecified	Low	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	city	1000	None
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Unspecified	Low	Ongoing	No/ or low cost to implement and require little staff support.	city	1000	None

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
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	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	city	1000	None
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		Unspecified	Low	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	city	1000	None
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**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.	city	1000	None
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	city	1000	None
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Unspecified	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	city	1000	None
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2010	Ongoing		Unspecified	Low	Ongoing	Requires cooperation of landowners to implement, but ultimately beneficial as will greatly reduce recovery costs and insurance rates.	city	1000	None
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	Low	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	city	1000	None

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
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		Unspecified	Low	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	city	0	None
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Unspecified	Low	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	city	1000	None

<b>Parkville 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	Medium	Adopt 2009 code in 2011		building code official	NA	NA
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	Medium	2010		planning & zoning	NA	NA
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Deferred		Unspecified	Unspecified					
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deferred		Unspecified	Unspecified					
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Deferred		Unspecified	Unspecified					
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred		Unspecified	Unspecified					



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
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Unspecified	Unspecified					
<b>Improve existing and future storm sirens</b>										
Purchase new/update existing storm sirens.	2015	Ongoing		Structure and Infrastructure Projects	Low	Unknown	Continued functionality of outdoor warning systems.	emergency management	Medium	Unknown
<b>Increase citizen disaster preparedness.</b>										
Provide public education materials.	2015	Ongoing		Education and Awareness Programs	High	2015	Citizens better prepared for disasters.	emergency management	Low	Unknown
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	High	Ongoing	Public awareness, through drills and events.	emergency management		
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred		Unspecified	Unspecified					
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Unspecified	High	Ongoing		planning & zoning	NA	Unknown
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	Deferred		Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Unspecified	Medium	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	emergency management	Low	Unknown

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 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		Unspecified	Unspecified			emergency management		
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		Unspecified	Unspecified			emergency management		
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	High	As grants become available	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	Unknown
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing		Unspecified	High	As grants are available	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	Unknown
**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	floodplain manager	Low	Unknown
**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		Unspecified	High	Ongoing	Low cost mechanism to identify r ways to prevent damages to residential properties	floodplain manager	Low	Unknown
<b>Implement or improve flood warning systems.</b>										
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	Deferred		Unspecified	Unspecified					

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
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	Unknown
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions.	2010	Ongoing		Unspecified	High	Ongoing	Sharing of data will improve county floodplain management.	emergency management	Low	Unknown
<b>Improve flood awareness education and preparedness training</b>										
Distribute and promote flood preparedness information.	2015	Ongoing		Education and Awareness Programs	High	2015	Low cost mechanism to increase flood safety.	emergency management	Low	Unknown
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deferred		Unspecified	Unspecified					
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	Unspecified			planning & zoning		
**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.	planning & zoning	Low	Unknown
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred		Unspecified	Unspecified					
<b>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</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing		Unspecified	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Medium	Unknown

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
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		Unspecified	High	Ongoing	Will prevent flooding for moderate costs	planning & zoning	Medium	Unknown
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		Unspecified	High	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	planning & zoning	Low	Unknown
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing		Unspecified	High	as available	No/ or low cost to implement and require little staff support.	planning & zoning	Low	Unknown
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	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Low	Unknown
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		Unspecified	High	Ongoing	Will reduce floodplain vulnerability and increase city greenspace.		Low	Unknown
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
**Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing		Unspecified	Unspecified			public works		

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
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 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.	2010	Ongoing		Unspecified	Medium	Ongoing	While initial cost may be high, will reduce recovery and replacement costs.	emergency management	Low	Unknown
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		Unspecified	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	emergency management	Medium	Unknown
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					
<b>Severe Thunderstorms</b>										
<b>Increase citizen severe thunderstorm preparedness.</b>										
Provide public education materials.	2015	Ongoing		Education and Awareness Programs	High	2015	Citizens better prepared for disasters.	emergency management	Low	Unknown
<b>Increase mass notification alert and warning capabilities.</b>										
Utilize Textcaster system for City	2015	Ongoing		Local Plans and Regulations	High	2015	Low cost mechanisms to increase public alert and warning.	emergency management	donated	donated

<b>Platte City 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	city admin	Medium	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
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	city admin	Medium	General Fund
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	planning & zoning	Low	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
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	public works	Medium	General Fund
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	emergency management	Low	City general funds
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing	NULL	Unspecified	Low	NA	Low/no cost mechanism to increase public safety.	emergency management	Low	General Fund
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Will provide legal mechanism to enforce floodplain management.	city admin	Medium	General Fund
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing	NULL	Unspecified	Low	NA	Will reduce recovery costs and ensure compliance with NFIP.	floodplain manager	Low	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
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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	General Fund
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	NULL	Unspecified	Low	NA	Preventing future flooding of properties that have had history of flood damage	floodplain manager	High	General Fund
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing	NULL	Unspecified	Medium	NA	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	General Fund
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Ongoing	NULL	Unspecified	Low	NA	Preventing future flooding of properties that have had history of flood damage	floodplain manager	Low	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	NULL	Unspecified	Low	NA	Low cost mechanism to identify ways to prevent damages to residential properties	floodplain manager	Low	General Fund
<b>Implement or improve flood warning systems.</b>										

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
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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Sharing of data will improve county floodplain management.	emergency management	Low	General Fund
<b>Improve flood hazard assessments and flood mapping.</b>										
**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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	planning & zoning	Low	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
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Free program that can increase floodplain management.	public works	Low	General Funds
**Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Ongoing	NULL	Unspecified	Low	NA	Free program that can increase floodplain management.	public works	Low	General Fund
<b>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</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Medium	NA	Low cost mechanism to improve floodplain management on local and regional levels.	planning & zoning	Low	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
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Will reduce floodplain vulnerability and increase city greenspace.	planning & zoning	Low	General Fund
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing	NULL	Unspecified	Low	NA	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 Community Rating System (CRS).	2010	Ongoing	NULL	Unspecified	Low	NA	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	General Fund
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing	NULL	Unspecified	Low	NA	While initial cost is high, will reduce recovery and replacement costs.	floodplain manager	High	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
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Ongoing	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	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	NULL	Unspecified	Low	NA	Will greatly reduce and offset construction costs and limit recovery costs.	city admin	Low	General Fund
<b>Severe Thunderstorms</b>										
<b>Increase citizen preparedness for severe thunderstorms.</b>										
Provide education and awareness	2015	Ongoing		Education and Awareness Programs	Low	Ongoing	Low cost mechanism to increase public safety.	emergency management	Low	City budget

<b>Platte Woods 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
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	Unspecified	Ongoing		city		Local
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	Unspecified	Ongoing		city		Local
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	Unspecified	Ongoing		city	Low	Local
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
Offer residential/commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city		
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	Unspecified	Ongoing		local utilities	Low	Local

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
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city		
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city		Local
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
<b>Install generator at city hall and other critical facilities.</b>										
Mutual Aid Agreements	2015	Ongoing		Unspecified	Unspecified	Ongoing		city	Low	Local
<b>Floods</b>										
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget

<b>Riverside 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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	Ongoing	Low/no cost mechanism to increase public safety.	building code official	Unknown	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	Deferred		Unspecified	Unspecified					
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	Ongoing	While may increase building costs, will lead to greater occupant safety	building code official	Unknown	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	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	None	None
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred		Unspecified	Unspecified					
Offer residential/ commercial builders/developers tax incentives to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Medium	Ongoing	Tax incentives could defray otherwise high costs for developing safe rooms and will likely lead to greater acceptance.	city admin	None	None
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	None	None
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										



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
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Deferred		Unspecified	Unspecified					
Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Deferred		Unspecified	Unspecified					
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
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	None	None
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city admin	None	None
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	public works	None	None
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Minimal	public relations budget
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	None	None
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

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
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>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.	2010	Ongoing		Unspecified	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Unknown	Unknown
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		Unspecified	Medium	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Unknown	Unknown
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Deferred		Unspecified	Unspecified					
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					

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
<b>Improve citizen preparedness.</b>										
Continue public education programs	2015	Undetermined		Education and Awareness Programs	High	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Low	budget
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deferred		Unspecified	Unspecified					
**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 mitigation efforts.	planning & public works	Unknown	Unknown
**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.	planning & public works	Unknown	Unknown
<b>Improve outdoor warning capability</b>										
Add additional outdoor siren as city develops.	2015	Undetermined		Structure and Infrastructure Projects	Low	2017-2020	Will ensure continued ability to alert citizens.	emergency management	Medium	budget
<b>Improve public alert and warning systems.</b>										
Continue to develop mass notification systems to the community-Upgrade capabilities	2015	Undetermined		Structure and Infrastructure Projects	Medium	2017-2020	Low/no cost mechanism to increase public safety.	emergency management	Low	budget
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Deferred		Unspecified	Unspecified					

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
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		Unspecified	Medium	Ongoing	Will prevent flooding for moderate costs	public works	Medium	Unknown
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	Deferred		Unspecified	Unspecified					
Identify funding sources for the acquisition of flood-prone land for environmental, recreational and flood mitigation uses.	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	Unspecified			floodplain manager		
Elevate public facilities in flood-prone areas. Encourage home owners and businesses to elevate their structures.	2010	Deferred		Unspecified	Unspecified					
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 reduce recovery costs and insurance rates.	floodplain manager	Unknown	Unknown

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
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

<b>Tracy 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Improve tornado preparedness</b>										
Construct tornado shelter	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	Will provide safe refuge for residents.	city	High	TBD as grants available
Install torando outdoor warning siren.	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	Will provide warning capability to residents	city	Med	TBD as grants available
Organize a plan with our community to set up triage in the event of a tornado disaster	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	Will ensure faster response and treatment for casualties.	city	Low	TBD as grants available
<b>Floods</b>										
<b>Improve flooding preparedness</b>										
Create a plan for funding a levee along Platte River in Tracy	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	Low cost mechanism to fund projects.	city	Low	TBD as grants available
Design and install a functional levee system	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	High cost will offset recovery and cleanup costs from flooding.	city	High	TBD as grants available
Design and install improvements to city storm sewers.	2015	Ongoing	NULL	Unspecified	High	TBD as funding allows	High cost will offset recovery and cleanup costs from flooding.	city	High	TBD as grants available
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain map	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to inform flood risk.	floodplain manager	Low	Operating Budget

<b>Weatherby Lake 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Deferred		Unspecified	Unspecified					
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	Medium	Ongoing	While may increase building costs, will lead to greater occupant safety	city	Medium	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	Low	Ongoing	Low/no cost mechanism to increase public safety.	city	Low	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	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	Unknown	Unknown
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Deferred		Unspecified	Unspecified					
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Low	Ongoing	Low/no cost mechanism to increase public safety.	city	Low	Unknown
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing		Unspecified	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	city	Low	Unknown

Anchor or strengthen above-ground transmission lines, poles and similar structures.	2010	Ongoing		Unspecified	Medium	Ongoing	Would reduce recovery costs and better limit damage/interruption to electrical and communications services.	local utility	High	Unknown
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	city	Low	Unknown
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Unspecified	High	Ongoing	Low/no cost mechanism to increase public safety.	city	Low	Unknown
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	Unknown	Unknown
Partner w/ trade orgs. to conduct safe room workshops.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	city	Unknown	Unknown
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
Adopt ordinances prohibiting residential and commercial development in flood plains or flood-prone areas.	2010	Ongoing		Unspecified	Low	Ongoing	Will provide legal mechanism to enforce floodplain management.	city	Unknown	Unknown
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		Unspecified	Low	Ongoing	Will reduce future vulnerability to flood.	city	Unknown	Unknown
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	Deferred		Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										



Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Unspecified	Low	Ongoing	Will reduce recovery costs and ensure compliance with NFIP.	city	Unknown	Unknown
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Deferred		Unspecified	Unspecified					
With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2010	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Implement or improve flood warning systems.</b>										
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	Deferred		Unspecified	Unspecified					
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public.	2010	Ongoing		Unspecified	Medium	Ongoing	Will ensure that citizens are prepared real time for flood events.	city	Unknown	Unknown

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.	city	Unknown	Unknown
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deferred		Unspecified	Unspecified					
**Obtain parcel data (assessed valuation and other information) for flood boundary areas and enhance vulnerability assessments for these areas.	2010	Ongoing		Unspecified	Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	city	Unknown	Unknown
Partner with FEMA in the Cooperating Technical Partners (CTP) Program to increase local involvement in, and ownership of, the flood mapping process.	2010	Deferred		Unspecified	Unspecified					
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred		Unspecified	Unspecified					
<b>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.</b>										
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		Unspecified	Medium	Ongoing	Will prevent flooding for moderate costs	city	Medium	Unknown
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		Unspecified	Medium	Ongoing	Low cost mechanism to improve floodplain management on local and regional levels.	city	Low	Unknown

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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing		Unspecified	Medium	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	city	Low	Unknown
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing	Not a current participant in eh NFIP; in progress	Unspecified	Medium	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	city	Low	Unknown
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
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	Deferred		Unspecified	Unspecified					
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	Deferred		Unspecified	Unspecified					
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing		Unspecified	Low	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	city	Medium	Unknown
<b>Severe Thunderstorms</b>										
<b>Increase resilience of government buildings to power outages.</b>										

Obtain a generator for the city hall, maintenance barn and the community center for power failures in the future	2015	Ongoing		Structure and Infrastructure Projects	Medium	2017	Ensure continuity of government operations.	city	100000	Grants
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<b>Weston 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
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
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
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 greater acceptance.	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
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										

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
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 services.	local utility	High	utility companies
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Deferred		Unspecified	Unspecified					
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
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
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Deferred		Unspecified	Unspecified					
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Deferred		Unspecified	Unspecified					
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
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
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred		Unspecified	Unspecified					
<b>Update emergency sirens within five years.</b>										
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
<b>Floods</b>										
<b>Discourage new development in floodplains and flood-prone areas.</b>										
**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 vulnerability to flooding.	2010	Ongoing		Unspecified	High	Ongoing	Will reduce future vulnerability to flood.	planning & zoning	Low	City of Weston

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
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	Deferred		Unspecified	Unspecified					
<b>Enhance public awareness and education efforts related to flooding.</b>										
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 home owners and businesses in flood-prone areas.	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, such as a Flood Mitigation and Preparedness Workshop.	2010	Ongoing		Unspecified	High	Ongoing	No/low cost mechanism to encourage flood preparedness.	emergency management	Low	City of Weston
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
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 options.	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low cost mechanism to identify ways to prevent damages to residential properties	floodplain manager	Low	City of Weston
<b>Implement or improve flood warning systems.</b>										

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
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	Deferred		Unspecified	Unspecified					
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
<b>Improve flood hazard assessments and flood mapping.</b>										
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	Deferred		Unspecified	Unspecified					
Coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS-Flood software program and/or GIS systems.	2010	Deferred		Unspecified	Unspecified					
**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 mitigation efforts.	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
Purchase HAZUS-Flood software from FEMA, possibly in conjunction with other local or regional stakeholders.	2010	Deferred		Unspecified	Unspecified					
<b>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.</b>										
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



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
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		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 collaboration and identify specific programs and activities that can be developed and i	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
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	Deferred		Unspecified	Unspecified					
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**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 management.	floodplain manager	Low	City of Weston
**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing		Unspecified	High	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	City of Weston
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										

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
As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Deferred		Unspecified	Unspecified					
**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 reduce recovery costs and insurance rates.	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 and pumping stations.	2010	Ongoing		Unspecified	High	Ongoing	While initial cost is high, will reduce recovery and replacement costs.	emergency management	Medium	City of Weston
Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Deferred		Unspecified	Unspecified					

<b>Northland Regional Ambulance District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase the number of tornadoe shelters within our jurisdiction.</b>										
Add number of shelters in area	2015	Ongoing		Structure and Infrastructure Projects	Medium	>2 year	Shelters would help decrease loss of life during event, and reduce exposure and medical need after event	work with co emergency management	Low	Unknown
<b>Floods</b>										
<b>Improve several county roads where high water is present when the Platte River floods.</b>										
Improve county roads, bridges, levees as needed to reduce impact of flooding	2015	Ongoing		Structure and Infrastructure Projects	Medium	3 year	Improvements to infrastructure of roads could reduce impact of flooding in area to help improve response times to emergencies and access to several areas in district	work with co public works	High	Unknown
<b>Severe Thunderstorms</b>										
<b>Improve our current alerting system to notify patrons of incoming severe weather.</b>										
Improve education on how to respond to severe weather.	2015	Ongoing		Education and Awareness Programs	Low	>1 year	Improving education of individuals in community could assist in loss of life, property. As well as use for mitigation of post-severe weather	EMS district, co emergency management	Low	Unknown

<b>West Platte Fire Protection District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Increase tornado preparedness.</b>										
Provide education and awareness materials.	2015	Ongoing		Education and Awareness Programs	High	2025	Low cost mechanism to increase public safety.	fire district	1000	budget
<b>Severe Thunderstorms</b>										
<b>Increase severe thunderstorm preparedness.</b>										
Provide education and awareness materials.	2015	Ongoing		Education and Awareness Programs	High	2025	Low cost mechanism to increase public safety.	fire district	1000	budget

<b>Ray County 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Ongoing		Unspecified	Low	Ongoing	Low/no cost mechanism to increase public safety.	county commission	Unknown	County Revenue
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	Medium	Ongoing	Buildings build to code.	emergency management	Unknown	County Revenue
<b>Encourage community partners to update/maintain policies regarding outdoor activities.</b>										
Encourage schools and sports leagues to review their policies regarding outdoor activities when hazardous conditions are present.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	low cost way of addressing the safety of those people that are engaged in outdoor activities	emergency management	Low	Not applicable
<b>Encourage construction of community tornado shelters in office complexes, factories, apt complexes, schools mobile home parks, stadiums, and other large population congregation centers.</b>										
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Businesses will develop safe rooms.	emergency management	Unknown	County Revenue
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
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	Unknown	County Revenue
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2010	Ongoing		Unspecified	Medium	Ongoing	Public building occupants protected from tornadoes/high winds.	co commission	TBD by project	County Revenue
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2010	Ongoing		Unspecified	Medium	Ongoing	Low/no cost mechanism to increase public safety.	emergency management	Unknown	County Revenue
Partner w/ trade orgs. to conduct safe room workshops.	2010	Deferred		Unspecified	Unspecified					
<b>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.</b>										

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
Explore options for the distribution of weather radios.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Low/no cost way to communicate information about hazardous conditions to residents so that they can take action to protect themselves.	emergency management	Low	Unknown
<b>Floods</b>										
<b>Enhance public awareness and education efforts related to flooding.</b>										
Encourage home owners and businesses to purchase flood insurance.	2010	Ongoing		Unspecified	High	Ongoing	Homeowners are projected against potential losses.	emergency management	0	N/A
<b>Examine repetitive flood loss properties in each county and determine feasible and practical mitigation options.</b>										
**As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2010	Ongoing		Unspecified	High	Ongoing	Repetitive loss properties eliminated and payouts minimized.	floodplain manager	0	0
**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties.	2010	Ongoing		Unspecified	High	Ongoing	Repetitive loss properties are able to be mitigated with minimal financial impact to landowner.	floodplain manager	Defined by project	As available
**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		Unspecified	High	ongoing	Bridge project reduced cost of damage to properties.	floodplain manager	Project dependent	As available
<b>Explore ways of maximizing the effectiveness of levee districts to monitor and maintain the levees.</b>										
Educate residents living in floodplain areas near levees on the importance of forming a viable levee district and the importance of maintenance fees.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Low cost mechanism to increase public safety.	floodplain manager	Low	Unknown
Work to strengthen and broaden existing levee districts to ensure that they have tools available to maintain the levees.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Low cost mechanism to increase public safety.	floodplain manager	Low	Unknown
<b>Implement or improve flood warning systems.</b>										

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
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		Unspecified	High	On going	Flood warning allows for mitigation measures to be implemented as available.	floodplain manager	0	0
<b>Improve flood hazard assessments and flood mapping.</b>										
Provide the public with information about keeping safe during a thunderstorm and ways to protect property from damage during severe thunderstorms.	2010	Ongoing	Provide pamphlets for high winds. FEMA P-320	Unspecified	High	Ongoing	Low cost way of increasing safety for public and protecting property from hazards associated with Severe Thunderstorms	emergency management	Unknown	Unknown

<b>Richmond 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Educate and raise awareness about the variety of roles and responsibilities needed before and after a tornado.</b>										
Provide opportunities like workshops and exercises to inform city staff and volunteers about the different roles and responsibilities needed after a tornado.	2015	Ongoing		Unspecified	Low	Ongoing	Low/no cost mechanism to increase public safety.		Low	Richmond City Budget
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2010	Completed	Adopted 2015 IBC in November, 2018.	Unspecified	Unspecified	2018				
Inform builders/developers of construction techniques and materials that may minimize tornado/ high wind damage to residential/commercial structures.	2010	Ongoing		Unspecified	Unspecified	Ongoing		planning		
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		Unspecified	Unspecified	Ongoing		building codes		
Review and enhance (if necessary) regulations related to design and installation of architectural features on buildings to minimize the creation of windborne debris.	2010	Completed	Adopted 2015 IBC in November 2018.	Unspecified	Unspecified	Ongoing				
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Consider adopting ordinances or regs requiring the construction of tornado shelters in new buildings where people live, work or congregate.	2010	Ongoing		Unspecified	Unspecified	Ongoing	Low/no cost mechanism to increase public safety.	building codes		
Encourage residential/ commercial builders/developers to construct safe rooms/community shelters in new public facilities.	2010	Ongoing		Unspecified	Unspecified	Ongoing		planning		
Work with chambers of commerce, school districts, corporations, etc. to promote benefits of safe rooms.	2010	Ongoing		Unspecified	Unspecified	Ongoing		emergency management		
<b>Encourage electric and telecommunications utilities to protect their existing infrastructure from the effects of tornadoes and high winds.</b>										
Adopt ordinances or regulations requiring the underground placement of new electric and telecommunications transmission lines.	2010	Ongoing	Ordinance requires underground electric for new development.	Unspecified	Unspecified	Ongoing		planning		



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
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		Unspecified	Unspecified	Ongoing		emergency management		
Offer financial or other incentives to utility providers to replace existing above-ground utility lines with underground utility lines.	2010	Ongoing		Unspecified	Unspecified	Ongoing		city		
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Assess existing facilities for shelter suitability. Mark clearly and inform visitors/employees of locations.	2010	Ongoing	New businesses are encouraged to develop emergency tornado plan for safe room locations and post in visible location for visitors and employees.	Unspecified	Unspecified	Ongoing		public works		
Consider adopting policies requiring incorporation of safe rooms/shelters in new public facility construction.	2010	Ongoing		Unspecified	Unspecified	Ongoing		planning		
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 for public tornado shelters.	Unspecified	Unspecified			public works		Unidentified
<b>Update plans to ensure that current resources and information is included for quick and effective response to a tornado.</b>										
Update the Local Emergency Operations Plan to include current shelter and city staff contact information .	2015	Ongoing	Update in progress.	Unspecified	Unspecified	Ongoing	Being able to access resources (shelters, staff, etc) in a timely manner may help prevent further injury from a tornado and possibly save lives.	emergency management	Low	Richmond City Budget
<b>Floods</b>										
<b>Improve flood hazard assessments and flood mapping.</b>										

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
**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			Low	Ongoing	Will allow for better assumptions to support mitigation activities.	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			Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	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			Low	Ongoing	Most data readily available and can be easily imported to identify potential areas for increased mitigation efforts.	public works	Low	Richmond City Budget
<b>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.</b>										
Consider alternative uses for floodplains and flood-prone areas, such as sports fields, parks, wildlife habitats, etc.	2010	Ongoing			Low	Ongoing	Will prevent flooding for moderate costs	planning	Medium	Richmond City Budget
<b>Participate in, and ensure compliance with, flood mitigation and floodplain management programs.</b>										
**Obtain the latest copies of flood insurance rate maps (FIRMs), floodplain maps and similar documents.	2010	Ongoing			Low	Ongoing	Having and maintaining most current FIRM map editions will allow for most accurate review of floodplain management.	floodplain manager	Low	Richmond City Budget

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**Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).	2010	Ongoing			Low	Ongoing	Will ensure reduced insurance rates for homeowners and businesses while controlling recovery costs.	floodplain manager	Low	Richmond City Budget
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing			Low	Ongoing	Will greatly reduce and offset construction costs and limit recovery costs.	floodplain manager	Medium	Richmond City Budget
<b>Severe Thunderstorms</b>										
<b>Increase public awareness and understanding about the hazards associated with thunderstorms such as lightning and high winds.</b>										
Provide the public with information about keeping safe during a thunderstorm and ways to protect property from damage during severe thunderstorms.	2015	Ongoing	Provide pamphlets for high winds. FEMA P-320	Unspecified	Unspecified	Ongoing	Low cost way of increasing safety for public and protecting property from hazards associated with Severe Thunderstorms	emergency management	Low	Richmond City Budget

<b>Kansas City 2020 Mitigation Strategy (Continuing Plan Participant, NFIP Participant)</b>										
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
<b>Tornadoes</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.</b>										
Adopt current edition of a model building code to address structural and architectural issues related to tornadoes and high wind events.	2015	Ongoing	Current building codes address this issue. However, KCMO will adapt as new codes are adopted.	Local Plans and Regulations	Medium	Ongoing		Building Code Dept	Unknown	Unknown
<b>Enhance Aviation Department's capability to protect from and respond to damage resulting from tornadic activity</b>										
Ensure personnel and tenants are adequately informed regarding potential weather conditions	2015	Ongoing	A notification system is in place. However, the system will be improved with new technology and best practices.	Education and Awareness Programs	High	Ongoing	unknown	Aviation	Unknown	Unknown
Expand the high wind refuge areas to accommodate all staff, tenants, and visitors to the airports as funding or need allows.	2020	New	This action is based upon available funding and will be completed as able.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
Implement improved weather monitoring systems in accordance with enhanced technology.	2020	New	This action is based upon available funding and technological advancements. This action will be completed as able.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
Maintain and enhance (as needed or available) internal notification systems to warn of impending tornadic activity and related hazards.	2020	New	This action is based upon available funding and technological advancements. This action will be completed as able.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
Research and implement improvements to the Aviation Department's capabilities to respond to damage caused by tornados through improved equipment and procedures	2015	Ongoing	The airports will continue to enhance and improve its capabilities as technology and resources allow.	Education and Awareness Programs	High	Ongoing	unknown	Aviation	Unknown	Unknown
<b>Enhance personnel awareness to the personal dangers inherent with tornados and mitigate any damage from the related hazards</b>										
Conduct training and provide information for personnel regarding the inherent dangers of and maintaining safety during a tornado	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Identify funding sources for training and information for personnel regarding the inherent dangers of and maintaining safety during a tornado	2015	Ongoing	Funding sources have not been identified, but we will continue to research/discover funding sources.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/natural hazards.</b>										
Retrofit or add shelters to existing public facilities with inadequate protection from tornadoes and high wind.	2015	Deferred	This action has been replaced by educating the facilities on how to shelter from a tornado.	Education and Awareness Programs	Low	2015	Human life		Unknown	Unknown
<b>Improve and enhance personnel resiliency to damage from tornados</b>										

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 personnel and tenants are adequately informed regarding potential weather conditions	2015	Ongoing	Technology and procedures are continually improving. Although the latest technology and procedures have been implemented over the last five years, new methods will be implemented as they evolve.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Identify and implement enhanced procedures and improve facilities to provide adequate protection of personnel and tenants from the damage of tornados	2015	Ongoing	Technology and procedures are continually improving. Although the latest technology and procedures have been implemented over the last five years, new methods will be implemented as they evolve.	Structure and Infrastructure Projects	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Improve and upgrade Public Works Department's capability to respond to damage caused by tornadoes</b>										
Enhance and upgrade the capability to remove debris resulting from tornado damage	2015	Deferred	This action is no longer under the scope of Public Works and has been deferred to other departments	Structure and Infrastructure Projects	Low	Deferred	unknown		Unknown	Unknown
<b>Improve KCMO's ability to mitigate damage from hazardous materials released due to tornadic activity</b>										
Ensure personnel have proper training (SDS, Hazcom, HAZWOPER, etc.) to respond and mitigate the damage from hazardous material release due to facility damage from tornados	2020	Ongoing	This training is provided on a regular basis, but funding sources to provide the training is researched.	Education and Awareness Programs	Medium	Ongoing		Emergency Management	Unknown	Unknown
Increase resiliency of storage mechanism for hazardous materials against a release due to tornadic activity	2020	New	Further research and funding is needed to make a determination on means to increase resiliency.	Structure and Infrastructure Projects	Medium	Undetermined		Fire Dept	Unknown	Unknown
Provide KCFD personnel training on the latest lessons learned and best practices in containing hazardous materials released due to tornadic activity.	2020	New	Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Provide training on methods to secure hazardous materials against release due to facility damage from tornados	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Research and implement equipment and procedures to efficiently contain hazardous material incidents resulting from tornadic activity.	2020	Ongoing	KCFD continues to research best practises for hazardous material containment, but funding for expanded research and equipment would be accepted.	Structure and Infrastructure Projects	Medium	Undetermined		Fire Dept	Unknown	Unknown

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Research training and funding for training for methods and best practices to respond and mitigate the damage from hazardous materials released due to facility damage from tornadoes	2020	New	Different departments within KCMO follow white sheets and other information regarding best practices. Funding for expanded mitigation measures would be accepted.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to secure hazardous materials from release due to facility damage from tornadoes	2020	New	Different departments within KCMO follow white sheets and other information regarding best practices. Funding for expanded mitigation measures would be accepted.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
<b>Improve Police Department's ability to conduct operations to mitigate loss of life and damage to property.</b>										
Identify funding source to provide best protection and highest visibility in order to ensure operation ability.	2015	Ongoing	PPE is continually provided; no funding exists at this time, but KCPD will continue to pursue.	Unspecified	Unspecified	Ongoing	unknown	Police Dept	Unknown	Unknown
Work with Regional National Weather Service to provide Storm Spotter training to officers.	2015	Ongoing	NWS continues to work with the police academy to train cadets in storm spotting and reporting techniques.	Unspecified	Unspecified	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Improve systems to monitor and track tornadoes</b>										
Improve the method of surveillance (currently cameras) in spotting and tracking tornadoes	2020	New	The KCMO OEM, with its partners, will continue to research improved systems and funding to implement those systems.	Structure and Infrastructure Projects	High	Undetermined		Emergency Management	Unknown	Unknown
<b>Improve the capabilities of urban search and rescue teams in collapsed building techniques</b>										
Identify and conduct training courses and exercises in collapsed building search and rescue techniques	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	Medium	Ongoing	unknown	Fire Dept	Unknown	Unknown
Identify funding sources to enhance the operational capabilities of urban search and rescue teams in conducting collapsed building search and rescues	2015	Ongoing	Capability improvement diminished due to defunding of USAR teams. FD will continue to pursue possible funding sources.	Structure and Infrastructure Projects	High	Ongoing	unknown	Fire Dept	Unknown	Unknown
Improve the capabilities of search and rescue teams through providing equipment and other means to conduct collapsed building search and rescues	2015	Ongoing	Capability improvement diminished due to defunding of USAR teams. FD will continue to pursue possible funding sources.	Structure and Infrastructure Projects	High	Ongoing	unknown	Fire Dept	Unknown	Unknown
<b>Improve the Health Department's ability to mitigate diseases resulting from tornadic activity</b>										
Enhance Health Department's ability to distribute mass medication after tornadic resulting diseases through improved methods, training, and funding.	2020	Ongoing	KCHD seeks enhancements to its ability to mass distribution of medication after a disaster. Additional funding for resources would be beneficial.	Education and Awareness Programs	Medium	Undetermined		health dept	Unknown	Unknown
Research methods and funding to enhance Health Department's inspection of food potentially contaminated resulting from tornadic activity.	2020	New	KCHD continues to research food inspection and contamination protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Medium	Undetermined		health dept	Unknown	Unknown



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Research methods, training, and funding to enhance Health Department's ability to track diseases resulting from tornadic activity.	2020	New	KCHD continues to research disease tracking protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Medium	Undetermined		health dept	Unknown	Unknown
Research methods, training, and funding to improve Health Department's processes for controlling disease vectors resulting from tornadic activity.	2020	New	KCHD continues to research disease vector control protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Medium	Undetermined		health dept	Unknown	Unknown
<b>Incorporate strategies into KCMO development plans to mitigate damage from tornadic activity</b>										
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	New	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		Planning Dept	Unknown	Unknown
<b>Increase personnel awareness of safety measures and mitigation actions to take in response to tornados</b>										
Develop and maintain mitigation programs the reduce the volume of debris that can cause damage during high winds resulting from tornados	2015	Deferred	This action belongs under a different goal.	Structure and Infrastructure Projects	Low	n/a	unknown		Unknown	Unknown
Ensure personnel are adequately informed regarding potential weather conditions.	2015	Ongoing	Personnel receive briefings and training to prevent or reduce the effects of weather related injuries.	Education and Awareness Programs	Unspecified	Ongoing		Emergency Management		
<b>Increase public awareness on mitigating the damage from tornados</b>										
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
Include tornado information in preparedness outreach and campaigns	2015	Ongoing	OEM provides information and conducts presentations regarding all types of severe weather.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	General Fund
Upgrade, enhance, and expand capabilities to warn public and private individuals, agencies, and business of imminent tornado threats	2015	Ongoing	Capabilities have been expanded from just the outdoor tornado warning sirens to include mass notification and social media.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	General Fund
Utilize social media to share weather forecasts and tornado safety information	2015	Ongoing	OEM added mass notification system in 2015 and accounts on Twitter and Facebook. It will continue to research the best method for mass notification and social media usage.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	General Fund
<b>Maintain and improve relationships with meteorologists and media</b>										
Participate in the Integrated Warning Team coordinated by NWS	2015	Ongoing	Participation is 2x per year.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	General Fund
<b>Mitigate damage and loss of life as a result of tornados to public and recreational areas and facilities</b>										
Build in or designate high wind refuge areas within recreational facilities	2015	Completed	Garrison Community Center has built a designated "safe room." Others will be evaluated on a case basis.	Structure and Infrastructure Projects	Low	2016	unknown		Unknown	Unknown

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Ensure tornado warning systems and protocols are available for recreational personnel at facilities	2015	Ongoing	This action needs additional implementation.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Identify and conduct training for personnel on tornado procedures	2015	Ongoing	Parks and Recreation currently provides training, but the program could be improved.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Mitigate or prevent the disruption of cyber networks, structures, and conduits as a result of damage from tornados</b>										
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
<b>Floods</b>										
<b>Decrease the number of fatalities and injuries from flooding</b>										
Explore and implement systems to protect drivers from flash flooding on roadways	2020	New	KCMO OEM, with other barricade departments, is exploring resources to improve roadway flashflooding protection.	Structure and Infrastructure Projects	Medium	Undetermined		public works	Unknown	Unknown
Explore systems to improve and enhance flood warnings and flood warning systems	2020	Ongoing	WSD continues to explore improved methods and systems with regard to flood warning.	Structure and Infrastructure Projects	Medium	Undetermined		public works	Unknown	Unknown
<b>Discourage new development in floodplain and flood prone areas</b>										
**Levy fees on new residential, commercial, and infrastructure development in floodplains or flood prone areas to finance flood mitigation, preparedness, response, and recovery actions	2015	Ongoing	No fees currently exist; WSD has no interest in pursuing at this time. CPD, however, may considered over the next 5 years.	Local Plans and Regulations	Medium	Ongoing	unknown	Planning Dept	Unknown	Unknown
<b>Enhance Health Department's ability to mitigate disease related issues caused by floods</b>										
Enhance Health Department's ability to distribute mass medication before or after the onset of flood caused diseases through improved methods, training, and funding.	2020	New	KCHD seeks enhancements to its ability to mass distribution of medication after a disaster. Additional funding for resources would be beneficial.	Education and Awareness Programs	High	Undetermined		health dept	Unknown	Unknown
Research methods and funding to enhance Health Department's ability to track diseases from flooding.	2020	Ongoing	KCHD continues to research disease tracking protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Medium	Ongoing		health dept		
Research methods and funding to enhance Health Department's inspection of food potentially contaminated by flood waters.	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		health dept	Unknown	Unknown
Research methods and funding to improve Health Department's processes for controlling disease vectors after a flood.	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		health dept		
<b>Enhance public awareness and education efforts related to flooding.</b>										



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Encourage home owners and businesses to purchase flood insurance.	2015	Ongoing	KCMO has sent out 414 of the 590 properties in need of flood insurance and owns the other 176 properties. KCMO has applied, also, for 2 NSF grants for education.	Education and Awareness Programs	High	Ongoing	Reduces the burden of repair costs to home and business owners through the use of flood insurance funds.	Planning Dept	Unknown	Water Services Dept., Office of Emergency Management
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from federal, state, and other organizations and provide them to home owners and businesses in flood-prone areas.	2015	Ongoing	Stormwater Utility has obtained information and distributed in-house and with the public. Improvement on this action will include mass education programs.	Education and Awareness Programs	High	Ongoing	Reduces risk to home owners and business owners in flood-prone areas through flood mitigation education.	Emergency Management	Unknown	Office of Emergency Management, Water Service Dept.
Research and utilize social media to share weather forecasts and flood safety information	2015	Ongoing	KCMO OEM partners with other agencies to provide the information via social media and messaging systems	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
<b>Enhance public awareness of the hazards associated with dam failures, as well as mitigation and preparedness activities</b>										
Collect and disseminate public education materials to property owners near on in inundation pathways of dams that address dam safety, preparedness, and mitigation activities	2015	Deferred	lacked funding; will carry over to the 2020 plan	Education and Awareness Programs	Low	Deferred				
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	2015	Deferred	lacked funding; will carry over to the 2020 plan	Education and Awareness Programs	Low	Deferred				
Work with partners to conduct public education campaigns to inform citizens living near the inundation pathways of dams of the need to be familiar with the emergency action plans for these dams	2015	Deferred	lacked funding; will carry over to the 2020 plan	Education and Awareness Programs	Low	Deferred				
<b>Enhance public awareness, outreach and education efforts related to flooding</b>										
During flood events, use public information officers and their tools along with the media to message risks from flooding.	2020	Ongoing	KCMO Departments continue to examine improved methods to disseminate information regarding flood risks even before the event.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Encourage owners of structures to purchase flood insurance	2020	Ongoing	This is accomplished by WSD on a continual basis as circumstances align.	Education and Awareness Programs	High	Undetermined		floodplain manager	Unknown	Unknown

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Identify funding resources for mechanisms to disseminate information to the public on all forms of flood risks for public awareness, outreach and education including health and disease associated with flood waters	2020	New	KCMO Departments continue to examine improved methods to disseminate information regarding flood risks even before the event. Discovering funding would be beneficial.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Obtain brochures and related publications on flood mitigation, preparedness, response and recovery from FEMA, SEMA, and other organizations and provide them to home owners and businesses in flood-prone areas.	2020	New	Due to limitations and federal fiscal issues, material is not a readily available. KCMO will continue to use these products as available in addition to producing its own.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Provide a web link homepage that serves as a flood identification, response and mitigation resources center of all the products available.	2020	Ongoing	This action is expanded during actual events, although general information is available.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Use other public meetings on storm water to educate and provide these tools with information handed out to serve as links that help the public learn and act.	2020	New	This will be pursued as personnel and resources are made available.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Work with Floodplain Management, Emergency Management, SEMA & FEMA to develop a public education program on identifying, planning and mitigating flood risk that provides the public tools to see their options.	2020	Ongoing	This is done on a regular basis.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
<b>Enhance the ability to protect the public during flooding incidents to mitigate loss of life and property</b>										
Improve KCPD's ability to assist with roadway flash flooding warnings to prevent loss of life and property.	2020	New	More specific actions will be researched (such as co-training) and implemented as resources become available.	Structure and Infrastructure Projects	High	Undetermined		Police Dept	Unknown	Unknown
Provide training for officers to improve response capability during flooding incidents.	2020	New	More specific actions will be researched (such as co-training) and implemented as resources become available.	Education and Awareness Programs	Medium	Undetermined		Police Dept	Unknown	Unknown
<b>Enhance the capabilities of city departments with flood response duties to mitigate damage from floods</b>										
Better leverage flood warning data that identifies flood risks likely to occur and the time left until they occur in order to help mobilize to mitigate or prevent threats to public safety where known and where time and resources.	2020	New	When methods and resources improve, WSD will research and utilize based on funding availability.	Education and Awareness Programs	High	Undetermined		public works	Unknown	Unknown
Coordinate the city-wide flood barricade task force and update the SOP annually	2015	Ongoing	Flood Barricade Task Force meets at the beginning of every storm season.	Education and Awareness Programs	High	Ongoing	unknown	public works	Unknown	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
Develop an automated barricade tracking system for known community flood risks and where possible add warnings for these locations to aid in gaining time to respond before flooding and flood damages occur.	2020	New	KCMO OEM, with other barricade departments, is exploring resources to improve roadway flashflooding protection.	Structure and Infrastructure Projects	Unspecified	Undetermined		public works	Unknown	Unknown
Identify funding sources and replace damaged barriers to prevent traffic through high water areas thus mitigating the loss of life.	2020	New	Additional funding will be researched and utilized if possible.	Structure and Infrastructure Projects	Unspecified	Undetermined		public works	Unknown	Unknown
<b>Enhance the EOC capability to monitor and mitigate flood conditions</b>										
Coordinate with Water Dept., dam stakeholders, and other groups associated with dam operations	2015	Ongoing	WSD regularly meet with USACE and KCMO Levee Committee	Structure and Infrastructure Projects	High	Ongoing		water dept		
Develop a contact list for agencies/individuals involved with dam operations	2015	Deferred	Deferred to other goal as that department works more closely with USACE	Structure and Infrastructure Projects	Medium	Deferred				
Explore and implement systems to improve flood warnings	2015	Ongoing	With WSD, ensure most current product and practices are being used to monitor and warn of flooding	Education and Awareness Programs	Medium	Ongoing		water dept		
Upgrade and enhance the surveillance capability of the EOC to monitor flood conditions	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
<b>Ensure continued operability of dam to prevent failure and resulting damage to the MCI facilities.</b>										
Enhance environmental control and erosion prevention to maintain the integrity of the KCI dam.	2015	Ongoing	Regular maintenance checks are made of the KCI owned dam	Structure and Infrastructure Projects	High	Ongoing		Aviation		
<b>Ensure levee requirements and integrity are maintained to prevent damage from flooding due to levee failure</b>										
Coordinate with US Army Corps of Engineers to ensure best practices and operations are utilized to maintain levees against failure and flooding	2015	Ongoing	WSD maintains a continual partnership with the US Army Corps. on all facility needs and improvement efforts.	Local Plans and Regulations	High	Ongoing		public works		
Identify and conduct training for levee inspectors to ensure levee integrity to prevent flooding	2015	Ongoing	This is done annually or semi-annually with US Army Corps. Inspections.	Structure and Infrastructure Projects	High	Ongoing		public works		
Perform inspections and assessments of levees and levee systems to track deficiencies and prevent levee failure and flooding	2015	Ongoing	This is Annually done with the US Army Corps and with a score from the US Army Corps. that drives operations, maintenance and improvement items.	Structure and Infrastructure Projects	High	Ongoing		public works		
<b>Examine repetitive flood loss properties and determine feasible and practical mitigation options</b>										
As funding allows, repetitive flood loss properties and structures will be targeted for buyout	2015	Deferred	Lack of adequate funds to implement on more than an extremely limited program.	Local Plans and Regulations	High	Deferred	unknown		Unknown	PIAC, other

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**Identify potential funding opportunities to implement mitigation options for repetitive flood loss properties	2015	Ongoing	The properties have been identified; this will carry over to the 2020 plan for further work	Local Plans and Regulations	Low	Ongoing	unknown	floodplain manager	Unknown	Unknown
**With stakeholders, explore incentive options to encourage property owners to take action to prevent or reduce future flood losses	2015	Ongoing	New development is subject to floodplain development review process. In partnering with OEM; this action is progressing through just education. More methods will need to be explored before this action can reach closer to completion.	Local Plans and Regulations	Medium	Ongoing	unknown	floodplain manager	Unknown	Unknown
**Work with owners of repetitive flood loss properties to identify feasible mitigation strategies and potential opportunities; determine property owners' interest in specific mitigation options	2015	Ongoing	The number of repetitive loss properties is 45/164; in 2017 KCMO vote \$150M in bond funds for mitigation; more work is to be done	Local Plans and Regulations	Medium	Ongoing	unknown	floodplain manager	Unknown	Unknown
<b>Expand KCPD's ability to assist with life safety operations during flooding</b>										
Acquire additional equipment necessary to participate in and conduct swift water rescues	2020	New	This is pursued as funding becomes available.	Other	Low	Undetermined		Police Dept	Unknown	Unknown
KCPD to enhance partnership with KCFD to participate in swift water training and rescues	2020	New	This action will be examined and implemented as applicable and available.	Education and Awareness Programs	Low	Undetermined		Police Dept	Unknown	Unknown
<b>Implement or improve flood warning systems</b>										
Determine the need for stream gauges in waterways currently lacking flood warning systems or additional stream gauges in waterways with flood warning systems already in place	2015	Completed	KCMO currently has 74 stream gauges with the intention of obtaining more as funding allows. This action will continue in a new form for 2020 plan.	Structure and Infrastructure Projects	High	2019	unknown		Unknown	Unknown
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public	2015	Ongoing	KCMO has access to multiple flood warning systems but is always pursuing to increase its ability to monitor and acquire flooding data.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Develop and implement procedures to quickly analyze and disseminate information from flood warning systems to the public .	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Develop information from the flood, stage, and risk data into KCMO's flood warning system software.	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Develop stage and gauge data to correlate from events with downstream risks and as modeling improved develop stage/flood elevation triggers that lead to downstream flooding of roads, structures, and parking lots.	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown

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
Use improved flood hazard and flood risk data, develop flow path data, time to crest data, and flood risk data to determine best locations for additional stream gauges and develop better warnings for all gauges to improve response time.	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Work with local governments and other stakeholders to share data from flood warning systems in multiple jurisdictions	2015	Ongoing	KCMO currently partners with Overland Park, KS, Johnson County, KS, and the Unified Government of Kansas City, KS. KCMO will pursue data sharing with other agencies.	Education and Awareness Programs	High	Ongoing	unknown	Emergency Management	Unknown	Unknown
Work with local governments and other stakeholders to share data from the flood warning systems and tools in multiple jurisdictions	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
<b>Implement projects and procedures to enhance resiliency of KCMO infrastructure against flood damage</b>										
Complete a Repetitive Loss Area Analysis to determine Risk and Benefits.	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	High	Undetermined		public works	Unknown	Unknown
Improve roadway structure to mitigate damage from flooding	2020	New	This action will be pursued as funding availability allows.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Provide enhancement to existing and new structures to improve flooding resiliency	2020	New	This action will be pursued as funding availability allows.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Reroute channels to alleviate overflow and mitigate against flooding	2020	New	This action will be pursued as funding availability allows.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Research funding to implement flood mitigation procedures and projects	2020	New	This action will be pursued, but there is no schedule at this time.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Research funding to support and educate that flood insurance coverage should be mandatory on all primary structures.	2020	New	This action will be pursued, but there is no schedule at this time.	Unspecified	Unspecified	Undetermined		Planning Dept	Unknown	Unknown
Support and push for more funding in FEMA Flood Insurance Policies for Increased Cost of Compliance to assist structures substantially damaged by flooding in rebuilding in a manner that will meet NFIP regulatory and/or Local requirements.	2020	New	This action is pursued, but the completion date is based on external agency schedules.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
<b>Improve and enhance the capability to respond to and mitigate damage from flooding incidents</b>										
Identify funding sources and replace damaged barriers to prevent traffic through high water areas thus mitigating the loss of life.	2015	Completed	Water Department paid out of own budget to obtain new barricades; will carry over into the 2020 plan	Structure and Infrastructure Projects	Medium	2016	unknown		Unknown	Unknown
<b>Improve community resiliency to flooding</b>										



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 critical services facilities (e.g. nursing homes) with oversight on flood plain management (evacuation plans, discourage building in flood plains, etc.)	2020	New	This action will be pursued, but there is no schedule at this time.	Education and Awareness Programs	Medium	Undetermined		Planning Dept	Unknown	Unknown
<b>Improve flood hazard assessments and flood mapping</b>										
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	2015	Deferred	Action unable to be completed due to limited staffing and funding.	Education and Awareness Programs	High	Deferred	unknown		Unknown	Unknown
**Coordinate the collection of demographics, economic, watershed, land use, and other data required by the HAZUS-Flood software program and/or GIS systems	2015	Ongoing	Many sources for HAZUS exist, but KCMO continues to progress toward completion. The data, however, does change over time, so this project will carry forward to the 2020 plan.	Education and Awareness Programs	High	Ongoing	unknown	Planning Dept	Unknown	Unknown
Develop and regularly update a mitigation list for structures, land/parcels, and roads/RoWs with a ranking for these based on depth, severity, and frequency of flooding.	2015	Ongoing	This list is 95% complete for 1) Regulatory FEMA flood Risks, however FEMA's Mitigation Tracker continues to be a one entry system, vs. a database upload by geospatial fields. Due to this KCMO has been unable to move our 11,819 identified community flood risks in 1) into FEMA/SMEA systems to improve identification efforts and support for mitigation post disasters. Ultimately KCMO still desires to make this data into an ongoing Notice of Intent in Mass to SEMA/FEMA for risks in order to have more ability to mitigate flood risks post disaster or through other supporting grant methods.	Education and Awareness Programs	High	Ongoing	unknown	public works	Unknown	Unknown
**Obtain parcel data for flood boundary areas and enhance vulnerability assessments for these areas	2015	Ongoing	Parcel data, particularly ownership, is constantly changing. Therefore, this is an ongoing action as the data fluctuates.	Structure and Infrastructure Projects	High	Ongoing	unknown	public works	Unknown	Unknown
Update City Stream Buffers based on new regulatory and non-regulatory products' 1% severity or better	2015	Ongoing	Discussions have been occurring between CPD and WSD on these efforts. This remains a funding issue for both groups and while it can be listed as ongoing given discussion on how to update and improve, it is unfunded.	Local Plans and Regulations	High	Ongoing	unknown	public works	Unknown	Unknown

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Use products that classify, identify, and weigh community flood risks and the technological tools developed for them to improve regulation and information sharing to get enhanced mitigation, improvements, and future developments.	2015	Ongoing	Geospatial analysis tools and communication tools have been key here. Efforts continue in 23 square miles of KCMO to test new methods of combining all of these needs. These methods are ArcGIS Online based.	Local Plans and Regulations	High	Ongoing	unknown	public works	Unknown	Unknown
Using city, state, and federal products complete the modernization of city regulatory and non-regulatory floodplains and adopt by the three phases outlined in Action #4 over time	2015	Ongoing	As noted above this is ongoing. Efforts have been completed in 1) Regulatory Floodplains, 2) Non-Regulatory Floodplains and 3) Hydrologic flow accumulation pathways.	Education and Awareness Programs	High	Ongoing	unknown	public works	Unknown	Unknown
Using city, state, and federal products develop, analyze, and prioritize flood risk, severity, and frequency for structures, land/parcels, and roads/RoWs. Continuously improve with 3 key phases of development by: 1) Regulatory Floodplain Areas, 2) Non-Reg	2015	Ongoing	Floodplain Areas has been completed for 95% of FEMA Regulatory Zones in KCMO for 10%, 4%, 2%, 1% and 0.2% annual chance storms. 1,786 Roads, 865 Structures, and 881 Parking Lots are flooded by the 10% annual chance storm in KCMO. 3,821 Roads, 4,715 Structures and 3,283 Parking Lots flood in the 0.2% annual chance storm in KCMO. This covers less than 33% of the City's territory though, as Regulatory floodplain stops on tributaries smaller than 1 square mile. 2) Non-Regulatory has tested new 2D methods in 33 square miles of KCMO including Second Cr., First Cr. and the North East Industrial District. These Research Efforts have confirmed that flood depth, velocity and risk products can be developed on old 1D modeling products down to 10 acres while modern 2D methods can identify these risks down to 10 square feet. Modern modeling methods have incredibly more capability in identifying flood risk, but accurate geospatial data on underground	Education and Awareness Programs	High	Ongoing	unknown	public works	Unknown	Unknown
Work to develop these map, data, and list products for GIS tools for direct use by public and private needs to fulfill multiple needs for information to aid flood mitigation	2015	Ongoing	This has not been begun due to ongoing development of the tools and products as discussed above. Products will remain internal for some time. Disclaimer requirements will exist when these flood risks are made available. Since the data is being developed this is an ongoing effort.	Education and Awareness Programs	High	ongoing	unknown	public works	Unknown	Unknown

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<b>Improve flood hazard assessments and flood mapping to assist in mitigating damage from flooding</b>										
Classify, identify, analyze and weigh community flood risks to improve regulation, analysis, identification, prevention, mitigation, improvements, and future development in ways that avoid flood risk.	2020	New	This action involves a extensive project; no completion date is foreseeable at this time.	Education and Awareness Programs	High	Undetermined		public works	Unknown	Unknown
Develop 1D/2D flood risk products for: 1.) Regulatory floodplain areas, 2.)Non-regulatory flood risk Areas 3.) Upstream Hydrologic Areas without hydraulics using flow accumulation pathways to 0.5 acre drainage.	2020	New	This action involves a extensive project; no completion date is foreseeable at this time.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Develop 1D/2D modeling paradigms and procedures to fully identify all community flood risk for all of the community.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Research and implement improvements to the language of Chapter 61 and adopt these new 1D/2D models, studies, and identified flood risks in there complete geospatial and modeling forms.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Update the City Stream Buffers using the above products with appropriate scientifically grounded methods to protect the community and public.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Use 1D/2D modeling methods and further geospatial analysis to identify flood depth, velocity, storage, shear stress risks for all flood risk areas.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Use the modeling products developed to improve FEMA based HAZUS and BCA Analysis of flood risks and costs vs. benefits of mitigation/prevention within the community.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Using the 1D/2D modeling methods and further geospatial analysis identify areas of erosive, slope or meander based risk to add to flood risk knowledge to support development risk identification.	2020	New	This action is based on the previous action.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Work to develop list products as GIS tools for direct use by public and private parties to fulfill multiple needs for information to aid flood mitigation.	2020	New	This action is based on the previous action.	Education and Awareness Programs	High	Undetermined		public works	Unknown	Unknown
<b>Improve hazard assessment information for dams within Kansas City, MO</b>										



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Analyze all dams, their capacity, and failure triggers in or affecting Kansas City, MO to estimate downstream risk to life and property.	2020	New	This action involves a extensive project; no completion date is foreseeable at this time.	Education and Awareness Programs	Medium	Undetermined		public works	Unknown	Unknown
Collaborate with MDNR and US Army Corps methods to develop and determine inundation mapping for dams failure to reduce loss of life from flooding.	2020	New	This action involves a extensive project and external agencies' schedules; no completion date is foreseeable at this time.	Education and Awareness Programs	Medium	Undetermined		public works	Unknown	Unknown
Identify and estimate the height of all dams within the Kansas City metropolitan area	2015	Ongoing	additional components and resources needed to obtain the data; will continue during the 2020 cycle	Structure and Infrastructure Projects	Medium	Ongoing		public works		
Include maps and information from inundation studies and dam emergency action plans in local emergency operations and land use plans	2015	Completed	current released maps are used in LEOP; will continue during the 2020 Hazard Mitigation Plan's cycle (if new information released)	Local Plans and Regulations	High	2018				
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	2015	Ongoing	additional components and resources needed to obtain the data; will continue during the 2020 cycle	Local Plans and Regulations	Medium	Ongoing		public works		
Prioritize by GIS the size and volume of the dams within the Kansas City metropolitan area under normal and full volume conditions	2015	Ongoing	additional components and resources needed to obtain the data; will continue during the 2020 cycle	Structure and Infrastructure Projects	Medium	Ongoing		public works		
Using the latest information from many resources, develop GIS layers and maps indicating the locations, inundation pathways, and hazard potential of known dams within the Kansas City metropolitan area.	2020	New	This action is dependent upon previous actions, which makes a completion date difficult to determine at this time.	Local Plans and Regulations	High			public works		
Using the latest information from the NID, MDNR's inventory of dams, and other resources, develop GIS layers and maps indicating the locations, inundation pathways, and hazard potential of known dams within the Kansas City metropolitan area.	2015	Completed	2017 - GIS was developed; this will be revisited during the 2020 Hazard Mitigation Plan's Goals and Actions	Local Plans and Regulations	High	2017				
Work with MDNR's Water Resources program and USACE to determine which dams in the Kansas City regional area have had inundation studies, inundation pathway maps, and emergency action plans developed	2015	Deferred	USACE is reluctant to provide necessary information to conduct this action	Structure and Infrastructure Projects	High	Deferred				
<b>Improve KCMO's ability to mitigate damage from hazardous materials released due to flooding</b>										

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Ensure personnel have proper training (SDS, Hazcom, HAZWOPER, etc.) to respond and mitigate the damage from hazardous material release due to flooding.	2020	New	This training is provided on a regular basis, but funding sources to provide the training is researched.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
Increase resiliency of storage mechanism for hazardous materials against a release due to flooding damage	2020	New	Further research and funding is needed to make a determination on means to increase resiliency.	Structure and Infrastructure Projects	High	Undetermined		Fire Dept	Unknown	Unknown
Provide KCFD personnel training best on the latest lessons learned and best practices in containing hazardous materials released due to flooding.	2020	New	Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Structure and Infrastructure Projects	High	Undetermined		Fire Dept	Unknown	Unknown
Provide KCFD personnel training on methods to secure hazardous materials against release due to flooding.	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
Research and implement equipment and procedures for KCFD to efficiently contain hazardous material incidents resulting from flooding.	2020	New	Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Structure and Infrastructure Projects	High	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to respond and mitigate the damage from hazardous materials released due to flooding.	2020	New	Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to secure hazardous materials from release due to flooding.	2020	New	Different departments within KCMO follow white sheets and other information regarding best practices. Funding for expanded mitigation measures would be accepted.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
<b>Improve reliability and capability of telecommunications network to resist the effects of flooding</b>										
Add redundancy and multiple pathways for fiber network to ensure continued operation during flooding	2020	New	This is an extensive project, and innovations change regularly. KCMO will continue to research and implement the best practises.	Structure and Infrastructure Projects	High	Undetermined		Police Dept	Unknown	Unknown
<b>Improve the capabilities of water rescue teams</b>										
Identify and conduct training courses and exercises for water rescues in flood waters	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing	unknown	Fire Dept	Unknown	Unknown
Identify funding sources to enhance the operational capabilities of water rescue teams in conducting rescues in flood waters	2015	Ongoing	Capability improvement dimished due to defunding of USAR teams. FD will continue to pursue possible funding sources.	Structure and Infrastructure Projects	High	Ongoing	unknown	Fire Dept	Unknown	Unknown

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Improve the capabilities of water rescue teams through providing equipment and other means to conduct flood water rescues	2015	Ongoing	Capability improvement diminished due to defunding of USAR teams. FD will continue to pursue possible funding sources.	Structure and Infrastructure Projects	High	Ongoing	unknown	Fire Dept	Unknown	Unknown
<b>Improve the capability of the Aviation Department to mitigate the damage from flooding</b>										
As funding becomes available, research elements for development of a Stormwater Master Plan at the MKC.	2020	New	This action is dependent upon funding; no anticipated completion date at this time.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
As needed, improve relief well systems at MKC to counter damage from flooding.	2020	Ongoing	Wells are improved/repared as funding and resources become available.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
Continue to research barricade techniques and products to protect against flooding at the Downtown Airport and purchase and/or implement as appropriate.	2020	Ongoing	This action is ongoing as funds and resources become available.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
Enhance and upgrade equipment and protocols to respond to and mitigate the damage from flooding	2015	Ongoing	2019 purchased new sand barrier equipment; added new wells. Will carry this action over to 2020 plan.	Structure and Infrastructure Projects	High	Ongoing	unknown	Aviation	Unknown	Unknown
Identify alternate staging and evacuation areas for personnel and equipment in the event of flooding	2015	Completed	Additional areas were located. Due to changing ownership and other factors, we will continue to pursue new areas as needed.	Structure and Infrastructure Projects	High	2019	unknown		Unknown	Unknown
<b>Improve the capability of the Aviation Department to mitigate the damage from flooding due to levee failure</b>										
Enhance and upgrade equipment and protocols to respond to and mitigate the damage from flooding from levee failure	2015	Ongoing	Wheeler Airport will continue to enhance and improve its capabilities as technology and resources allow.	Structure and Infrastructure Projects	High	Ongoing		public works		
Identify alternate staging and evacuation areas for personnel and equipment in the event of flooding from levee failure	2015	Completed	Additional areas were located. Due to changing ownership and other factors, we will continue to pursue new areas as needed.	Local Plans and Regulations	Medium	2018		public works		
<b>Improve the structural integrity of dams to reduce the threat of dam failures, which cause flooding</b>										
Develop and implement codes and ordinances requiring minimum site and construction standards for dams	2015	Deferred	funding for research not available; will carry over to 2020 plan	Local Plans and Regulations	Low	Deferred				
Encourage dam owners to repair or upgrade their dams, particularly those that are more 50 years old, by offering them a reduction in local taxes or similar financial incentive	2015	Deferred	no resources to provide incentives or assistance	Structure and Infrastructure Projects	Medium	Deferred				
Identify and pursue grants to repair or improve dams	2015	Deferred	no grants available	Structure and Infrastructure Projects	Low	Deferred				
Mandate for regular repairs and improvements to dams within the Kansas City metropolitan area owned by the city and privately	2015	Ongoing	will carry over to the 2020 plan	Structure and Infrastructure Projects	High	Ongoing		public works		
<b>Improve warning and evacuation systems and procedures in the event of flooding due to dam failure</b>										

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Adopt policies, codes, or ordinances to discourage development in the vicinity of dam inundation zones	2015	Deferred	need dam failure analysis and current USACE inundation maps	Local Plans and Regulations	Medium	Deferred				
Where feasible, add and maintain outdoor warning systems to campgrounds and other recreational areas downstream from dams	2015	Deferred	no funding available; will carry over to 2020 plan with broader, more accurate action	Structure and Infrastructure Projects	Medium	Deferred				
<b>Incorporate strategies into KCMO development plans to mitigate damage from flooding</b>										
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	New		Local Plans and Regulations	Medium	Undetermined		Planning Dept	Unknown	Unknown
<b>Increase public awareness of health and disease related issues associated with flood waters</b>										
Collect and disseminate public education materials that address health and disease issues associated with flood waters	2015	Ongoing	Information is provided by the Health Dept. during flooding incidents.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	PHP/ CRI/ Levee Funds/ Core PH Funds/ Water Services/ City Communications
Identify funding resources for mechanisms to disseminate information to the public regarding protection against health and disease issues associated with flood waters	2015	Ongoing	The Health Department is continuously researching funding sources.	Education and Awareness Programs	Low	Ongoing	unknown	health dept	Unknown	PHP/ CRI/ Levee Funds/ Core PH Funds/ Water Services/ City Communications
Utilize various methods of social media to inform and educate the public regarding health and disease issues associated with flood waters	2015	Ongoing	Information is provided by the Health Dept. during flooding incidents.	Education and Awareness Programs	Low	Ongoing	unknown	health dept	Unknown	PHP/ CRI/ Levee Funds/ Core PH Funds/ Water Services/ City Communications
<b>Integrate flood mitigation strategies with projects and activities designed to protect, restore, or enhance ecosystems and the environment and/or create recreational opportunities for the community.</b>										
Consider alternative uses for floodplains and flood prone areas that have less impact from flooding	2015	Ongoing	Although KCMO has considered many alternate uses, future possibilities may arise. This will be carried over to the 2020 plan. CPD reviews private projects.	Natural Systems Protection	Medium	Ongoing	unknown	Planning Dept	Unknown	PIAC, other
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	2015	Deferred	Study has demonstrated that these actions may not be most efficacious to achieving flood mitigation. KCMO is exploring a more holistic approach to this goal.	Natural Systems Protection	High	Deferred	unknown		Unknown	PIAC, other
Develop partnerships between emergency management, floodplain management, and environmental groups to provide education regarding the benefits of collaboration	2015	Ongoing	This action covers multiple actions, and will thus be reflected in the 2020 plan. Much progress has been made.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
Identify funding sources for the acquisition of flood prone land of environmental, recreational, and flood mitigation uses	2015	Ongoing	KCMO has identified may funding sources. However, the City will explore additional sources as they become available; will carry this over to the 2020 plan	Natural Systems Protection	High	Ongoing	unknown	Emergency Management	Unknown	PIAC, other

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Identify specific programs and activities that can be developed and implement with stakeholders	2015	Ongoing	WSD continues to provide grants for environmental programs and efforts through a number of non-profit organizations. Efforts with floodplain management to improve their IB 120 and improve floodplain administration continue. WSD and CPD continue to discuss and work on efforts regarding the Stream Buffer Ordinance.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
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	2015	Ongoing	Much land has been acquired; means of less costly acquisition have been explored. This will carry over to the 2020 plan.	Natural Systems Protection	Medium	Ongoing	unknown	Planning Dept	Unknown	PIAC, other
Research controlling runoff to original native conditions with respect to peak flow and velocity.	2020	New	Completion date is dependent upon findings.	Unspecified	Unspecified	Undetermined		public works	Unknown	Unknown
Seek better methods to reduce runoff volume increases caused by development to be more like native conditions through finding a lower flow rate and velocity that can reduce erosive impacts due to larger total volume of runoff.	2020	New	Completion date is dependent upon findings.	Natural Systems Protection	Medium	Undetermined		public works	Unknown	Unknown
Seek storage, infiltration, roughness and soil amendment methods of slowing, reducing, infiltrating and storing runoff including reduction of impervious parking.	2020	New	Completion date is dependent upon findings.	Natural Systems Protection	Medium	Undetermined		public works	Unknown	Unknown
Seek to reduce collection by inlets and conveyance by pipes where development or redevelopment creates runoff volumes greater than native or existing runoff totals.	2020	New	Completion date is dependent upon findings.	Natural Systems Protection	Medium	Undetermined		public works	Unknown	Unknown
Work with area environmental groups and other stakeholders to develop and implement flood mitigation strategies that also promote the restoration and/or sustainability of fish and wildlife habitats	2015	Deferred	This action is covered by the following action "Develop partnerships between emergency management, floodplain management, and environmental groups to provide education regarding the benefits of collaboration"	Natural Systems Protection	Medium	Deferred	unknown		Unknown	PIAC, other
<b>Mitigate flooding damage to public facilities</b>										
Identify funding sources to implement flood damage mitigation mechanisms such as water pumping equipment	2015	Ongoing	This is done for known existing ground water for new facilities; retrofitting is sporadic due to funding.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	public works	Unknown	Unknown



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Implement flood damage mitigation mechanisms such as water pumping equipment	2015	Ongoing	This is done for known existing ground water for new facilities; retrofitting is sporadic due to funding.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	public works	Unknown	Unknown
Research the feasibility of installing water pumping equipment in public facilities to reduce the damage from minor flooding	2015	Ongoing	This is done for known existing ground water for new facilities; retrofitting is sporadic due to funding.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	water services	Unknown	Unknown
<b>Participate in and ensure compliance with flood mitigation and floodplain management programs.</b>										
Obtain the latest copies of the flood insurance rate maps (FIRMs), floodplain maps, and similar documents	2015	Completed	KCMO has obtained the most recent maps. However, the data changes over time and, therefore, new maps will be obtained as they become available. Continued through 2020 plan.	Local Plans and Regulations	High	2016	unknown		Unknown	Unknown
Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS)	2015	Completed	KCMO participates in the NFIP and will continue to do so. This will be carried over to the 2020 plan.	Local Plans and Regulations	High	2019	unknown		Unknown	Unknown
**Continue efforts to train staff and specialize in order to become a Certified Technical Partner with FEMA.	2020	Ongoing	WSD continues to improve its staff such as through Certified Technical Partner training.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
**Coordinate and fund with private partners to obtain the latest copies of the flood insurance rate maps (FIRMs), and other GIS products. Add other supporting information within a Flood Risk component of City's Parcel Viewer Mapper.	2020	New	This is an extensive project with multiple external agencies, and a completion date cannot be determined at this time.	Education and Awareness Programs	High	Undetermined		public works	Unknown	Unknown
**Improve Floodplain Administration through providing more tools for the administrators, public, and development that easily, technically inform them of flood risk and requirements.	2020	Ongoing	Innovations are constantly developed; a completion date cannot be determined at this time.	Education and Awareness Programs	High	Undetermined		floodplain manager	Unknown	Unknown
**Improve Information Bulletin information relating to Floodplain Regulatory compliance and processes.	2020	Ongoing	The Information Bulletin is improved as new requirements are adopted.	Local Plans and Regulations	High	Undetermined		floodplain manager	Unknown	Unknown
**Participate in the Community Rating System (CRS) and plan its stages of improvement and needs in order to seek support and funding.	2020	Ongoing	This is an ongoing action as circumstances and requirements change.	Local Plans and Regulations	High	Undetermined		floodplain manager	Unknown	Unknown
**Participate in the National Flood Insurance Program (NFIP)	2020	Ongoing	This is an action performed on an annual basis.	Local Plans and Regulations	High	Undetermined		floodplain manager	Unknown	Unknown
<b>Reduce flood related damage to public and private property in flood prone areas through structural and nonstructural retrofits, prevention of development within, or removal of property</b>										
**Adopt ordinances prohibiting private development in flood plains or flood-prone areas.	2020	New	Unknown timeframe for this action.	Local Plans and Regulations	High	Undetermined		Planning Dept	Unknown	Unknown

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**As funding allows, repetitive flood loss properties or structures will, in flood prone areas, be targeted for buyout or other mitigations that meet FEMA and local Minimums of protection for base flood elevations and freeboard.	2020	New	Buyouts occur as funding becomes available and varies by property.	Unspecified	Unspecified	Undetermined		floodplain manager	Unknown	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.	2020	New	Completion date is based on external agency timelines.	Structure and Infrastructure Projects	Medium	Undetermined		Emergency Management	Unknown	Unknown
For public facilities, seek to modernize to FEMA regulatory compliance, even when not required, if cost benefit justifies.	2020	Ongoing	This action is accomplished as funds and resources become available.	Unspecified	Unspecified	Undetermined		public works	Unknown	Unknown
Identify funding sources to implement flood damage mitigation mechanisms.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Levy fees on non-public use development in floodplains or flood-prone areas to finance flood mitigation, preparedness, response and recovery actions.	2020	Ongoing	This action is based on the frequency of land development.	Local Plans and Regulations	High	Undetermined		Planning Dept	Unknown	Unknown
Provide funding for water and wastewater districts to elevate vulnerable equipment, or implement other modifications, at water and wastewater facilities to FEMA and other standards.	2020	New	This action to be accomplished as time and resources allow.	Unspecified	Unspecified	Undetermined		public works	Unknown	Unknown
Reduce/mitigate the risk of flooding on public facilities in flood-prone areas.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
Require development identify its frequency and severity of risk and base flood elevations per NFIP and City adopted APWA standards and require appropriate local community freeboard.	2020	Ongoing	This action is taken as needed when new development arises.	Local Plans and Regulations	High	Undetermined		public works	Unknown	Unknown
Research and implement methods to continually improve Chapters and standards to better identify flood risks to better inform and prevent harm to or from development or redevelopment.	2020	New	This action to be accomplished as time and resources allow.	Unspecified	Unspecified	Undetermined		public works	Unknown	Unknown
**Use methods to encourage home owners and businesses to reduce/mitigate the risk of flooding for their structures.	2020	New	This action to be accomplished as time and resources allow.	Unspecified	Unspecified	Undetermined		public works	Unknown	Unknown
<b>Reduce flood-related damage to public, residential and commercial property in flood-prone areas through structural and nonstructural retrofits or removal of property.</b>										

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As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	2015	Deferred	Studies have shown that, due to population density, buyout may not always be the most efficacious means in all cases. This action will be expanded in the 2020 plan.	Structure and Infrastructure Projects	Low	Deferred	Reduces the cost of repetitive damages through the structural and nonstructural retrofits and removal of structures on flood-prone property.		Unknown	PIAC, Water Service Dept., Other
**Elevate public facilities in flood prone areas and encourage private sector facilities to do likewise.	2015	Ongoing	KCMO continues to locate and elevate public facilities as funding is available.	Structure and Infrastructure Projects	High	Ongoing	Reduce flood-related damage to property by elevating structures above flood planes.	public works	Unknown	All departments
Encourage homeowners and businesses in flood-prone areas to elevate mechanical systems (i.e., furnaces, hot water heaters, electrical panels, etc.).	2015	Completed	Educational programs have resulted in substantial improvement	Education and Awareness Programs	High	2017	Reduces the cost of property damage to public, residential and commercial property in flood-prone areas.			
Encourage utility providers to assess their facilities, distribution systems, etc. for vulnerability to flooding and, if necessary, retrofit or modify them to decrease vulnerability.	2015	Deferred	FEMA has taken on the responsibility	Structure and Infrastructure Projects	High	Deferred	Reduces the risk to general public by ensuring reliable utility services			
**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.	2015	Ongoing	Retrofitting falls under WSD; CPD ensures new construction complies with building codes	Structure and Infrastructure Projects	High	Ongoing	City Planning Development	city planning		
**Identify incentives to offer home owners and businesses to remove or retrofit their structures in flood-prone areas.	2010	Ongoing	This action to be accomplished as time and resources allow.	Unspecified	High	Ongoing	Reduce flood damage to property by encouraging home and business owners to employ flood mitigation strategies to their structures.	city planning	Unknown	Water Service Dept.
<b>Reduce the potential for flooding due to dam failures by enhancing inspection efforts</b>										



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Adopt codes or ordinances requiring permits, engineering studies, and safety certifications prior to the construction of new dams	2015	Ongoing	all earthen structures must comply with earthen building codes	Local Plans and Regulations	Medium	Ongoing		city planning		
Adopt local ordinances and/or state laws requiring all dam owners to develop emergency action plans for their dams and provide local public safety agencies with copies of these plans	2015	Deferred	lack funding; will carry over to 2020 plan	Local Plans and Regulations	Low	Deferred				
For dams not regulated by the state, encourage dam owners to inspect their dams at least annually and submit the results to MDNR	2015	Ongoing	only 1 person is available to continue this action	Education and Awareness Programs	Low	Ongoing		water services		
Use storm water storage facilities covenants, to compile GIS locations and inspect on repeating schedule as funding allows. Where O&M is needed, use the covenants and KCMO chapters to preserve function and maintain dam safety.	2020	New	This is an extensive project with multiple external agencies, and a completion date cannot be determined at this time.	Structure and Infrastructure Projects	High	Undetermined		water services	Unknown	Unknown
<b>To decrease the threat of flooding, reduce the potential for dam failures by adding to the number of dams regulated by the state.</b>										
Contact representatives in the state legislature to propose changes in state law lowering the height limit for regulated dams to 25 feet on those holding back 50 acre-feet or more of water.	2020	New	This action requires cooperation of state legislature and is difficult to determine a schedule.	Local Plans and Regulations	Medium	Undetermined		city council	Unknown	Unknown
Revise existing dam safety laws and/or regulations to add all high hazard dams to the list of regulated dams, regardless of dam height and reservoir storage capacity, until the hazard potential of these dams can be downgraded.	2020	New	This is an extensive project with multiple external agencies, and a completion date cannot be determined at this time.	Local Plans and Regulations	Medium	Undetermined		water services	Unknown	Unknown
<b>Heat</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of fire as a result of excessive heat and prolonged drought.</b>										
Adopt building code modifications prohibiting the use of highly flammable materials in the construction of roofs on new homes or replacing roofs on existing homes.	2015	Ongoing	Building code modifies as needed.	Structure and Infrastructure Projects	Medium	Ongoing		Planning Dept		
<b>Enhance Aviation Department's ability to protect its staff, tenants, and visitors from the effects of prolonged heat</b>										
Improve and enhance Aviation Department's fleet of buses to serve as alternate sources of power for its facilities during excessive heat	2020	New	This action will be performed as funding and resources are identified.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown

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Improve and enhance Aviation Department's fleet of buses to serve as cooling stations during excessive heat	2020	New	This action will be performed as funding and resources are identified.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
<b>Enhance Health Department's capability to ensure food safety resulting from excessive heat</b>										
Research and implement methods, training, and funding to improve Health Department's inspection of food potentially tainted from exposure to excessive heat.	2020	New	KCHD continues to research food inspection and contamination protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	High	Undetermined		health dept	Unknown	Unknown
<b>Ensure at-risk, low income, and elderly residents have adequate capability to maintain climate temperatures in their homes during heat waves.</b>										
Identify funding sources to provide materials and labor to assist at-risk, low income, and elderly residents with improving their residence's capability to maintain climate control during heat waves	2015	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		Emergency Management		
Obtain funding to continue the KCPD's program of providing and distributing fans to citizens in need	2020	New	This action is dependent upon a funding source, so a completion time and status cannot be determined at this time.	Other	High	Undetermined		Police Dept	Unknown	Unknown
Partner with community service organizations to provide materials and volunteer labor to assist at-risk, low income, and elderly residents with improving their residence's capability to maintain climate control during heat waves.	2015	Ongoing	The City partners with many organizations.	Other	Medium	Ongoing		Emergency Management		
<b>Improve Aviation Department's capacity to mitigate damage from fires during periods of excessive heat and drought</b>										
Increase the number apparatuses and improve firefighting equipment at MCI to suppress both aviation, structural, and wildland fires exacerbated by drought and excessive heat.	2020	New	Status to be determined once funding sources are identified.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
<b>Improve Aviation facilities' resistance to excessive heat to reduce energy consumption for climate control within the facilities</b>										
Research and implement best practices for building methods to prevent heat absorption and mitigate heat damage.	2015	Ongoing	In 2017, Wheeler built a new facility with improved climate resistance. Wheeler will continue, however, to improve its facilities as technology and resources allow.	Structure and Infrastructure Projects	Medium	Ongoing		Emergency Management		
<b>Improve community resiliency to and mitigate health related issues from excessive and prolonged heat incidents.</b>										
Identify funding resources for mechanisms to improve methods that enhance communities' resistance to excessive heat through various mechanisms, procedures, and planning.	2015	Deferred	Lack of funding and resources	Local Plans and Regulations	Medium	2020				

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Participate in urban planning to improve communities' resistance to excessive heat through various mechanisms such as increased foliage coverage, reflective building roofs, etc.	2015	Deferred	Lack of funding and resources to implement.	Structure and Infrastructure Projects	Medium	2020				
Research and identify improved methods that enhance communities' resistance to excessive heat through various mechanisms, procedures, and planning.	2015	Deferred	Lack of funding and resources	Local Plans and Regulations	Medium	2020				
<b>Improve Health Department's ability to track adverse effects of excessive heat.</b>										
Improve Health Department's methods through research, training, and funding to track deaths related to excessive heat and drought in order to implement measures to reduce further deaths.	2020	Ongoing	KCHD continually seeks improved best practices but could use additional funding.	Education and Awareness Programs	High	Undetermined		health dept	Unknown	Unknown
<b>Improve local and regional capabilities to reduce the number of deaths related to excessive and prolonged heat incidents.</b>										
Identify and provide training to emergency medical services, hospitals, medical examiners, and other personnel to accurately report heat related deaths and illnesses.	2015	Ongoing	The Health Department strives to partner with many agencies to track and treat heat related illnesses.	Education and Awareness Programs	Medium	Ongoing		health		
Identify and provide training to health department, emergency medical service, and other city personnel to prevent, recognize, identify, and provide treatment for heat related health issues.	2015	Ongoing	The Health Department continually provides materials for employees and the public on health related issues.	Education and Awareness Programs	Medium	Ongoing		health		
Identify and provide training to school personnel, athletic clubs, and other private entities operating in non-climate controlled conditions to prevent, recognize, identify, and provide treatment for heat related health issues.	2015	Ongoing	The Health Department continually provides materials for employees and the public on health related issues.	Education and Awareness Programs	Medium	Ongoing		health		
Identify funding resources for mechanisms to provide training to emergency medical services, hospitals, medical examiners, and other personnel to accurately report heat related deaths and illnesses.	2015	Deferred	Health Dept. unable to locate funding; the programs will continue regardless.	Education and Awareness Programs	Medium	Deferred				
Identify funding resources to provide training to City personnel, and emergency medical service personnel to prevent, recognize, identify, and provide treatment for heat related health issues.	2015	Deferred	Health Dept. unable to locate funding; the programs will continue regardless.	Education and Awareness Programs	Medium	Ongoing				

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Identify funding resources to provide training to health department, emergency medical service, and City personnel to prevent, recognize, identify, and provide treatment for heat related health issues.	2015	Ongoing	The Health Department continually provides materials and training for employees and the public on health related issues.	Education and Awareness Programs	Medium	Ongoing		health		
Identify funding resources to provide training to school personnel, athletic clubs, and other private entities operating in non-climate controlled conditions to prevent, recognize, identify, and provide treatment for heat related health issues.	2015	Ongoing	The Health Department strives to partner with many agencies to track and treat heat related illnesses.	Education and Awareness Programs	Medium	Ongoing		health		
Identify funding resources to research, identify, and procure mechanisms and equipment to provide climate controlled on-site medical facilities to provide rapid treatment for heat related complications to mitigate potential deaths from excessive heat.	2015	Ongoing	The Health Department will continue to research funding sources.	Education and Awareness Programs	Medium	Ongoing		health		
Obtain funding to increase the fleet of apparatuses that can be used to transport citizens in need to cooling centers	2020	New		Other	High	Undetermined		emergency management	Unknown	Unknown
Partner with local health agencies, local medical examiners, hospitals, and emergency medical services to track heat related deaths and injuries.	2015	Ongoing	The Health Department strives to partner with many agencies to track and treat heat related illnesses.	Local Plans and Regulations	Medium	Ongoing		health		
Research and identify mechanisms and equipment to provide climate controlled on-site medical facilities to provide rapid treatment for heat related complications to mitigate potential deaths from excessive heat incidents.	2015	Ongoing	Procedures and mechanisms are updated as best practices improve.	Structure and Infrastructure Projects	Medium	Ongoing		health		
Research and identify mechanisms to improve the efficiency of tracking and relating to partners information regarding heat related deaths and injuries.	2015	Ongoing	The Health Department strives to partner with many agencies to improve its ability to track and treat heat related illnesses.	Local Plans and Regulations	Medium	Ongoing		Emergency Management		
<b>Improve public facilities' resistance to excessive heat to reduce energy consumption for climate control within the facilities</b>										
Encourage the use of best practices and architectural procedures as outlined in the LEED certification process.	2015	Deferred	Although KCMO currently encourages as described under the International Code, LEED is unofficially being phased out. LEED is not expected to remain over the next 5 years.	Education and Awareness Programs	Medium	2020				

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Identify funding sources to implement best practices for building methods to prevent heat absorption and mitigate heat damage	2015	Ongoing	Funding has not been found for this action but will continue to pursue.	Structure and Infrastructure Projects	Medium	Ongoing		emergency management		
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		Emergency Management		
<b>Improve reliability and capability of telecommunications network to resist the effects of excessive heat</b>										
Add heat resistant switches to the fiber network	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	High	Undetermined		Police Dept	Unknown	Unknown
<b>Improve resiliency to and mitigate damage from prolonged periods of drought.</b>										
Develop and implement a plan to mitigate and respond to drought.	2015	Deferred	This action is deferred due to lack of funding and resources. It will be reestablished once funding and resources are available.	Local Plans and Regulations	Low	Deferred				
<b>Improve the Police Department's ability to mitigate the effects of heat on officers in order to maintain operational ability during heat waves.</b>										
Identify and conduct training courses to mitigate adverse effects of excessive heat on officers.	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing		Police Dept		
Identify funding source to ensure facility climate control capabilities.	2015	Ongoing	Funding not discovered but will continue to pursue.	Structure and Infrastructure Projects	Medium	Ongoing		Police Dept		
Identify funding source to ensure officers' are able to continue operating during excessive heat waves.	2020	Ongoing	PPE for the officers is continually provided; no funding at this time but will continue to pursue.	Local Plans and Regulations	Medium	Ongoing		Police Dept		
Identify funding source to ensure sustainability vehicle operational abilities during excessive heat waves.	2015	Ongoing	PPE for the officers is continually provided and vehicles can operate with a/c; no funding at this time but will continue to pursue.	Structure and Infrastructure Projects	Medium	Ongoing		Police Dept		
<b>Improve the wildland firefighting capabilities of the fire department to mitigate loss of life and property damage caused by excessive heat and prolonged drought.</b>										
Identify and inventory alternative water resources for the fire departments, map their locations, and determine appropriate methods for utilizing these water resources.	2015	Deferred	KCMO is the major water provider for the area. There are no alternate sources. However, there is some capacity through mutual aid to obtain water.	Structure and Infrastructure Projects	High	Deferred				
Identify funding sources to enhance the operational capabilities and fire prevention programs of fire departments.	2015	Ongoing	FD will continue to pursue possible funding sources.	Local Plans and Regulations	High	Ongoing		fire		
Identify training opportunities and conduct training courses and exercises focusing on wildland firefighting.	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	Medium	Ongoing		fire		
<b>Incorporate strategies into KCMO development plans to mitigate damage from excessive heat and prolonged drought</b>										



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Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan with respect to heat.	2020	New	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		Planning Dept	Unknown	Unknown
<b>Increase personnel and tenant awareness on health issues related to excessive and prolonged heat incidents.</b>										
Conduct training and disseminate information on identifying symptoms of heat injuries.	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	Medium	Ongoing		health		
Conduct training and disseminate information to personnel and tenants on mitigating the effects of prolonged heat	2015	Ongoing	Training for personnel and tenants is continual and refreshed constantly.	Education and Awareness Programs	Medium	Ongoing		health		
Ensure outdoor crews have adequate personal protection to mitigate the effects of prolonged heat.	2015	Ongoing	Equipment and briefing for personnel is provided.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
Ensure personnel and tenants are adequately informed regarding potential weather conditions.	2015	Ongoing	Information is regularly disseminated via briefings.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
<b>Increase public awareness on procedures to mitigate the effects of drought.</b>										
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		Emergency Management		
Provide drought preparedness information to public and private individuals and organizations	2015	Ongoing	OEM partners with Health Department and Water Services to disseminate information.	Education and Awareness Programs	Low	Ongoing		Emergency Management		
Research and utilize social media to share drought and safety information	2015	Ongoing	OEM partners with Health Department and Water Services to disseminate information	Education and Awareness Programs	Low	Ongoing		Emergency Management		
<b>Increase resiliency and mitigate any effects of a drought on public and recreational areas and facilities.</b>										
Implement procedures to increase the use of native species for landscaping purposes.	2015	Ongoing	This program was implemented by Parks and Recreation in their 2018 Sustainability Plan but will continue in the 2020 plan.	Natural Systems Protection	Medium	Ongoing		parks and recreation; public works		
Research and implement capabilities of KCMO's fountains to pump and recirculate water.	2015	Ongoing	This has been accomplished for a handful of fountains and will continue for the 2020 plan.	Structure and Infrastructure Projects	Medium	Ongoing		parks and recreation		
<b>Increase the city's resiliency to heat waves in outdoor locations</b>										
Identify funding sources to Research and implement landscaping techniques to provide resistance from sunlight during critical hours.	2015	Deferred	The Parks and Recreation Dept. has taken ownership of this goal and action. It will be added to their part of the 2020 plan.	Structure and Infrastructure Projects	Medium	2020				
Parks and Recreation will identify funding sources to Research and implement landscaping techniques to provide resistance from sunlight during critical hours.	2020	New	The Parks and Recreation Dept. has taken ownership of this goal and action.	Structure and Infrastructure Projects	Medium	Ongoing		parks and recreation		
Parks and Recreation will research and implement landscaping techniques to provide resistance from sunlight during critical hours.	2020	New	The Parks and Recreation Dept. has taken ownership of this goal and action.	Structure and Infrastructure Projects	Medium	Undetermined		parks and recreation		

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Research and implement landscaping techniques to provide resistance from sunlight during critical hours.	2015	Deferred	The Parks and Recreation Dept. has taken ownership of this goal and action. It will be added to their part of the 2020 plan.	Structure and Infrastructure Projects	Medium	2020				
<b>Increase whole community resiliency through public awareness on health issues related to excessive and prolonged heat incidents.</b>										
Identify funding resources for mechanisms to disseminate information to the public regarding health issues related to heat waves.	2015	Ongoing	This action to be accomplished as time and resources allow.	Education and Awareness Programs	Medium	Ongoing		emergency management		
Partner with other agencies and stakeholders to disseminate information to the public regarding heat related health issues.	2015	Ongoing	Partnering with other agencies and stakeholders is an ongoing action.	Education and Awareness Programs	Medium	Ongoing		emergency management		
Research and identify mechanisms to improve and increase the efficiency of disseminating information to the public regarding health issues related to heat waves.	2015	Ongoing	This action is based on previous actions. Researching and utilizing better mechanisms is an ongoing action.	Education and Awareness Programs	Medium	Ongoing		emergency management		
<b>Mitigate and prevent additional harmful effects of heat waves.</b>										
Update and implement best practices outlined in ozone policies to mitigate any additional harmful effects from ozone producing activities.	2015	Ongoing	Updated plan with OEQ in 2018; included using propane mowers, natural gas trucks, and battery operated leaf blowers. This action will continue through the 2020 plan.	Local Plans and Regulations	Medium	Ongoing		emergency management		
<b>Mitigate or prevent damage due to wildland fires resulting from excessive heat and prolonged drought.</b>										
Identify and conduct training for personnel on improved procedures, technology, and methods for enhancing the capability of preventing wildland fires.	2015	Ongoing	Parks and Recreation personnel take burn training through the Missouri Dept. of Conservation.	Education and Awareness Programs	High	Ongoing		emergency management		
Identify funding to enhance the capability of preventing wildland fires through improved procedures, technology, and methods.	2015	Ongoing	Parks and Recreation is looking at ways to improve its procedures and funding sources.	Structure and Infrastructure Projects	Medium	Ongoing		emergency management		
Research and implement improvements to the Aviation Department's capabilities to respond to wildland fires through improved equipment and procedures	2015	Ongoing	Purchased a "brush buggy," enhanced ARFF fire suppression capabilities, and participate in ongoing brush clearance	Other	High	Ongoing		Aviation		
<b>Reduce water consumption and increase water conservation efforts to mitigate the effects of a drought.</b>										
Identify funding sources to implement methods to track water usage within public and private buildings.	2020	New	Water Services will locate funding to implement water usage tracking methods.	Structure and Infrastructure Projects	Medium			water services		

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Identify funding sources to implement methods to track water usage within public buildings.	2015	Completed	KCMO has funding for new software to provide real-time usage data; this action will carry over to the 2020 plan as new technology becomes available to track both public and private usage.	Structure and Infrastructure Projects	Medium	2020				
Identify funding sources to research best management practices in watering techniques and management for landscaping to reduce water need and consumption.	2015	Deferred	Parks and Recreation has taken over all landscaping. It is a duplicate action.	Structure and Infrastructure Projects	Low	2020				
Research and identify methods to track water usage within public buildings.	2015	Completed	Improvements have been made to tracking water usage; will carry this action over to the 2020 plan with broadening of action to include all city facilities and residential	Structure and Infrastructure Projects	Medium	2020				
Research and identify methods to track water usage within public and private buildings.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium			water services		
Research and implement water conservation technologies for new and existing public facilities.	2015	Deferred	Currently KCMO has some capability. This action will be combined and renamed for the 2020 plan.	Structure and Infrastructure Projects	Medium	2020				
Research, identify, and locate funding sources to implement water conservation technologies for new and existing public facilities.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium			water services		
<b>Severe Thunderstorms</b>										
<b>Encourage building practices and the use of materials that reduce the damaging effects of severe thunderstorms</b>										
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	Unknown
<b>Enhance Aviation Department's ability to notify and warn staff and tenants of approaching storms, lightning, and other hazards to mitigate loss of life and property.</b>										
Implement improved weather monitoring systems as needed in accordance with enhanced technology changes.	2020	New	This action to be accomplished as time and resources allow.	Education and Awareness Programs	Medium	Undetermined		Aviation	Unknown	Unknown
Maintain and enhance internal notification systems as applicable to warn of impending severe thunderstorms and related hazards.	2020	Ongoing	This action to be accomplished as time and resources allow.	Education and Awareness Programs	Medium	Undetermined		Aviation	Unknown	Unknown
<b>Enhance personnel awareness to the personal dangers inherent with severe thunderstorms and mitigate any damage from the related hazards</b>										
Conduct training and provide information for personnel regarding the inherent dangers of and maintaining safety during a tornado	2015	Ongoing	Personnel receive briefings and training to prevent or reduce the effects of weather related injuries.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown



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Identify funding sources for training and information for personnel regarding the inherent dangers of and maintaining safety during a tornado	2015	Ongoing	Mitigation funding is always sought.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Ensure adequate measures are taken to mitigate any damage from severe thunderstorms</b>										
Develop and maintain mitigation programs to the reduce the volume of debris that can cause damage during high winds resulting from severe thunderstorms	2015	Deferred	Solid Waste division is no longer under Public Works - now Neighborhood and Housing Services.	Structure and Infrastructure Projects	Medium	Deferred	unknown		Unknown	Unknown
<b>Implement procedures to mitigate the damage caused by severe thunderstorms</b>										
Ensure personnel and tenants are adequately informed regarding potential weather conditions	2015	Ongoing	A notification system is in place. However, the system will be improved with new technology and best practices.	Education and Awareness Programs	Medium	Ongoing	unknown	Emergency Management	Unknown	Unknown
<b>Improve and upgrade Public Works Department's capability to respond to damage caused by severe thunderstorms</b>										
Enhance and upgrade the capability to remove debris resulting from severe thunderstorm damage	2015	Deferred	Solid Waste division is no longer under Public Works - now Neighborhood and Housing Services	Structure and Infrastructure Projects	Medium	Deferred	unknown		Unknown	Unknown
<b>Improve Aviation Department's capacity to mitigate damage from fires caused by lightning or other severe thunderstorm hazards</b>										
Increase the number apparatuses and improve firefighting equipment at KCI to suppress both structural and wildland fires from lightning strikes.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium	Undetermined		Aviation	Unknown	Unknown
<b>Improve Police Department's ability to maintain operational ability during severe weather.</b>										
Identify funding source to provide best protection and highest visibility in order to ensure operation ability.	2015	Ongoing	PPE is continually provided; no funding at this time but will continue to pursue.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	Police Dept	Unknown	Unknown
Work with Regional National Weather Service to provide Storm Spotter training to officers.	2015	Ongoing	NWS still provides training at the academy.	Education and Awareness Programs	Medium	Ongoing	unknown	Police Dept	Unknown	Unknown
<b>Improve systems to monitor and track thunderstorms</b>										
Implement mechanisms to provide warning against lightning to protect life.	2020	New	This action to be accomplished as time and resources allow.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
Improve the method of surveillance (currently cameras) in spotting and tracking severe thunderstorms	2020	New	This action to be accomplished as time and resources allow.	Education and Awareness Programs	High	Undetermined		Emergency Management	Unknown	Unknown
<b>Improve the capability of Water Services to operate and be protected from the effects of severe thunderstorms</b>										
Implement and improve the capability of Water Service facilities to be protected from lightning strikes and damage	2015	Ongoing	WSD is upgrading our facilities electrical and electronic communications systems, including SCADA continually. Building Facilities are also a focus point for lightning protection. All of these methods continue to better protect systems from static electricity and lightning threats. Our CIP has ongoing funding that supports these goals.	Structure and Infrastructure Projects	Low	Ongoing	unknown	water services	Unknown	Unknown

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
Implement and upgrade back-up and redundant power sources to maintain Water Services operability during severe thunderstorms	2015	Ongoing	The majority of major facilities have generator based backup and backup power sources. Funding for upgrade and expansion into remaining and smaller facilities is ongoing as Utility funding allows.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	water services	Unknown	Unknown
<b>Incorporate strategies into KCMO development plans to mitigate damage from severe thunderstorms</b>										
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	New	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		Planning Dept	Unknown	Unknown
<b>Increase personnel awareness of safety measures and mitigation actions to take in response to severe thunderstorms</b>										
Ensure personnel are adequately informed regarding potential weather conditions	2015	Ongoing	Personnel receive briefings and trainings to prevent or reduce the effects of weather related injuries.	Education and Awareness Programs	Medium	Ongoing	unknown	emergency management	Unknown	Unknown
<b>Increase public awareness on mitigating the damage from thunderstorms</b>										
Conduct high wind refuge inspections for businesses	2015	Ongoing	Trained personnel conduct inspections upon request.	Education and Awareness Programs	Medium	Ongoing	unknown	Fire Dept	Unknown	General Fund
Include weather information in preparedness outreach and campaigns	2015	Ongoing	OEM continues to provide information and presentations for KCMO.	Education and Awareness Programs	Medium	Ongoing	unknown	emergency management	Unknown	General Fund
Utilize social media to share forecasts and thunderstorm safety information	2015	Ongoing	KCMO OEM uses Nixle for mass notification (iPAWS as warranted).	Education and Awareness Programs	Medium	Ongoing	unknown	emergency management	Unknown	General Fund
<b>Increase the resiliency of public facilities from damage incurred from severe thunderstorms</b>										
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	emergency management	Unknown	Unknown
Provide protection to public facilities from high winds, lightning and hail to mitigate any damage that might be caused.	2015	Ongoing	Some measures have been adopted, mostly for new construction. City Hall's roof was hardened against hail and falling ice.	Structure and Infrastructure Projects	Medium	Ongoing	unknown	public works	Unknown	Unknown
Research best practices and building code requirements in providing protection to public facilities from high winds, lightning and hail to mitigate any damage that might be caused.	2015	Ongoing	General Services researches best practices in protection.	Education and Awareness Programs	Medium	Ongoing	unknown	Planning Dept	Unknown	Unknown
<b>Maintain and improve relationships with meteorologists and media</b>										
Maintain Storm Ready Community designation and Weather Ready Nation Ambassador status	2015	Completed	Storm Ready designation is up for renewal in 2020.	Education and Awareness Programs	Medium	2016	unknown		Unknown	
Participate in the Integrated Warning Team coordinated by NWS	2015	Ongoing	Participation is 2x per year.	Education and Awareness Programs	Medium	Ongoing	unknown	emergency management	Unknown	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
Renew Storm Ready Community designation and Weather Ready Nation Ambassador status in 2020.	2020	New	Renew Storm Ready Community designation in 2020.	Education and Awareness Programs	High	Undetermined		Emergency Management		
<b>Mitigate facility damage from severe thunderstorms and their effects</b>										
Research mechanisms and funding to increase KCMO building resiliency to damage from high winds and hail.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium	Undetermined		public works	Unknown	Unknown
<b>Mitigate or prevent damage and loss of life as a result of severe thunderstorms to public and recreational areas and facilities</b>										
Ensure compliance with best practices and building codes related to mitigating damage from severe thunderstorms	2015	Deferred	Inadequate resources to enforce. However, new construction must comply with codes as part of permitting process.	Local Plans and Regulations	Medium	Deferred	unknown		Unknown	Unknown
<b>Mitigate or prevent the disruption of cyber networks, structures, and conduits as a result of damage from severe thunderstorms</b>										
Research and implement enhanced operational methods, hardware, systems, and technology to mitigate cyber disruption from the effects of severe thunderstorms.	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
<b>Reduce the damage due to the release of hazardous materials resulting from facilities damaged by severe thunderstorms</b>										
Ensure fire personnel have proper training (SDS, Hazcom, HAZWOPER, etc.) to respond and mitigate the damage from hazardous material release due to facility damage from severe thunderstorms	2020	New	This training is provided on a regular basis, but funding sources to provide the training is researched.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Provide training on methods to secure hazardous materials against release due to facility damage from severe thunderstorms	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to respond and mitigate the damage from hazardous materials released due to facility damage from severe thunderstorms	2020	New	Different departments within KCMO follow white sheets and other information regarding best practices. Funding for expanded mitigation measures would b accepted.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to secure hazardous materials from release due to facility damage from severe thunderstorms	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
<b>Severe Winter Weather</b>										
<b>Enhance Health Department's capability to ensure food safety resulting from severe winter weather</b>										
Research and implement methods, training, and funding to improve Health Department's inspection of food potentially tainted from loss of power due to ice.	2020	New	KCHD continues to research food inspection and contamination protocols but could use additional funding to expand its efforts.	Education and Awareness Programs	Low	Undetermined		health	Unknown	Unknown
<b>Ensure at-risk, low income, and elderly residents have adequate capability to heat their homes in the winter.</b>										

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
Identify funding sources to provide materials and labor to assist at-risk, low income, and elderly residents with improving their residence's capability to maintain climate control during cold weather.	2015	Ongoing	CDBG funding annually provides for water heaters, A/C units, and furnaces. More funding would increase the success of the program.	Education and Awareness Programs	Medium	Ongoing		health		
Partner with community service organizations to provide materials and volunteer labor to assist at-risk, low income, and elderly residents with improving their residence's capability to maintain climate control during cold weather.	2015	Ongoing	The City partners with many organizations.	Education and Awareness Programs	Medium	Ongoing		health		
<b>Ensure city departments and human services agencies are aware of facilities with generators or emergency power that can be used as shelters in the event of severe winter weather.</b>										
Consider the adoption of policies requiring emergency power systems in the construction of new public facilities.	2015	Completed	Larger structures must have emergency power systems for the safety of staff/clients.	Structure and Infrastructure Projects	Medium	2020				
Disseminate information on which facilities are open as shelters or warming stations during severe winter weather.	2020	Ongoing	This action is performed as needed during the event.	Education and Awareness Programs	High	Undetermined		Emergency Management		
<b>Ensure that KCFD is able to continue life saving operations during severe cold and other winter weather elements</b>										
Identify procedures and funding to improve the resiliency of equipment and apparatuses from extreme cold and ice.	2020	New	This action is performed as funding and resources allow.	Local Plans and Regulations	Medium	Undetermined		Fire Dept	Unknown	Unknown
Provide training for KCFD personnel on operating under winter weather conditions.	2020	Ongoing	KCFD trains its personnel in best practices as needed but would seek additional funding to improve its training.	Education and Awareness Programs	Medium	Undetermined		Fire Dept	Unknown	Unknown
<b>Ensure the Parks and Recreation Department has the capacity to respond to winter related issues</b>										
Enhance the capability to respond to winter related issues such as snow accumulation and ice	2015	Ongoing	Sidewalk snow plows have been purchased; more will be done toward this action	Structure and Infrastructure Projects	High	Ongoing		Parks and Recreation		
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		Parks and Recreations		
<b>Implement and upgrade back-up and redundant power sources to maintain Water Services operability during severe winter weather</b>										
Implement and upgrade back-up and redundant power sources to maintain Water Services operability during severe winter weather	2015	Ongoing	The majority of major facilities have generator based backup and backup power sources. Funding for upgrade and expansion into remaining and smaller facilities is ongoing as Utility funding allows.	Structure and Infrastructure Projects	Low	Ongoing		water services		
<b>Improve Aviation Department's capability to mitigate the damage from severe winter storms</b>										

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
As available or needed, enhance and/or expand the recently upgraded system of sensors to monitor surface conditions such as temperature, ice accumulation, or other complications from winter weather	2020	New	This action is performed as funding and resources allow.	Education and Awareness Programs	High	Undetermined		Aviation	Unknown	Unknown
As funding is available or as needed, increase and enhance ice melting apparatuses for planes and surfaces	2020	New	This action is performed as funding and resources allow.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
As funding or technology improves, increase Aviation Department's ability to mitigate damage from power loss caused by ice storms and other winter weather hazards	2020	New	This action is performed as funding and resources allow.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
Improve and enhance Aviation Department's fleet of buses to serve as alternate sources of power for its facilities	2020	New	This action is performed as funding and resources allow.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
Improve and enhance Aviation Department's fleet of buses to serve as warming stations	2020	New	This action is performed as funding and resources allow.	Structure and Infrastructure Projects	High	Undetermined		Aviation	Unknown	Unknown
Provide and upgrade redundant systems to ensure continued operation during severe winter weather.	2015	Ongoing	2017 a new facility was built. Wheeler Airport will continue to enhance and improve its capabilities as technology and resources allow. KCI purchased CNG buses that can be used as generators.	Structure and Infrastructure Projects	High	Ongoing		Aviation		
Research and upgrade operations and technology to improve capability to mitigate the damage from ice and snow	2015	Ongoing	2018 new de-icing chemicals implemented; 2019 runway sensors installed. Wheeler Airport will continue to enhance and improve its capabilities as technology and resources allow.	Structure and Infrastructure Projects	Medium	Ongoing		Aviation		
<b>Improve Health Department's ability to track adverse effects of severe winter weather.</b>										
Improve Health Department's methods through research, training, and funding to track deaths related to severe winter weather.	2020	New	KCHD continually seeks improved best practices but could use additional funding.	Education and Awareness Programs	High	Undetermined		health	Unknown	Unknown
<b>Improve infrastructure resiliency to the effects of ice and snow</b>										
Research and improve, as needed, road treatments and techniques to alleviate ice and snow from roadways	2020	New	This action is performed as funding and resources allow.	Structure and Infrastructure Projects	Medium	Undetermined		public works	Unknown	Unknown
<b>Improve Police Department's ability to maintain operational ability during severe winter weather to assist with mitigating loss of life .</b>										
Identify and conduct training courses to mitigate adverse effects of severe winter weather on officers.	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	Medium	Ongoing		Police Dept		
Identify funding in order to conduct training in emergency vehicle operation during ice and snow.	2015	Ongoing	Funding not discovered but will continue to pursue both funding and the related activity.	Structure and Infrastructure Projects	High	Ongoing		Police Dept		



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
Identify funding in order to provide winter weather related protective equipment for officers	2015	Ongoing	PPE is continually provided; no funding at this time but will continue to pursue.	Other	High	Ongoing		Police Dept		
<b>Improve public facilities' resistance to heat loss to reduce energy consumption for climate control within the facilities</b>										
Identify funding sources to implement best practices for building methods to prevent heat loss and mitigate damage to excessive cold temperatures	2015	Ongoing	Funding for programs is continuously sought.	Structure and Infrastructure Projects	Medium	Ongoing		public works		
Research and implement best practices for building methods to prevent heat loss and mitigate damage to excessive cold temperatures	2015	Ongoing	Much of the activity is based on retrofitting older buildings.	Structure and Infrastructure Projects	Medium	Ongoing		public works		
<b>Improve reliability and capability of telecommunications network to resist the effects of excessive heat</b>										
Add cold resistant switches to the fiber network to increase resilience and ensure operability during excessive cold.	2020	New	This action is performed as funding and resources allow	Structure and Infrastructure Projects	High	Undetermined		Police Dept	Unknown	Unknown
<b>Improve resiliency of public facilities against the effects of winter weather</b>										
Research and provide funding to install generators or other alternate power source for all new public building construction.	2020	New	This action is performed as funding and resources allow	Structure and Infrastructure Projects	High	Undetermined		public works	Unknown	Unknown
<b>Improve the capability to respond to the effects and mitigate the damage from severe winter storms.</b>										
Implement and enhance locating equipment upon snow/ice removal equipment to maximize efficient utilization and enhance operational capability.	2015	New	The City is continually looking for ways to improve its snow/ice removal capabilities. KCMO IT recently upgraded the system by which plows are tracked. KCMO IT will continue to enhance the capabilities as technology progresses.	Unspecified	Unspecified	Ongoing		public works		
<b>Incorporate strategies into KCMO development plans to mitigate damage from severe winter weather</b>										
Incorporate mitigation strategies into the development of KCMO's Comprehensive Plan	2020	New	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		Planning Dept	Unknown	Unknown
<b>Increase personnel and tenant awareness on health issues related to severe winter weather</b>										
Conduct training and disseminate information on identifying symptoms of prolonged exposure to cold	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing		Emergency Management		
Conduct training and disseminate information to personnel and tenants on mitigating the effects of severe winter weather	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing		Emergency Management		
Ensure outdoor crews have adequate personal protection to mitigate the effects of prolonged cold	2015	Ongoing	Equipment and briefing for personnel is provided by many departments and divisions having outdoor work crews.	Education and Awareness Programs	High	Ongoing		Emergency Management		

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 personnel and tenants at the airports are adequately informed regarding potential weather conditions.	2015	Ongoing	A notification system is in place. However, the system will be improved with new technology and best practices.	Education and Awareness Programs	High	Ongoing		Emergency Management		
<b>Increase personnel awareness on health issues related to excessive and extreme cold</b>										
Conduct training and disseminate information on identifying and treating cold related injuries	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing		Emergency Management		
Conduct training and disseminate information to personnel on mitigating the effects of extreme cold	2015	Ongoing	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	High	Ongoing		Emergency Management		
Ensure outdoor crews have adequate personal protection to mitigate the effects of prolonged or severe cold	2015	Ongoing	PPE is provided and upgraded as needed.	Other	High	Ongoing		Emergency Management		
<b>Increase public awareness on health issues related to severe winter weather and cold temperatures</b>										
Collect and disseminate public education materials that address winter weather safety, preparedness, and mitigation activities.	2015	Ongoing	The Health Department continually provides materials for the public on health related issues.	Education and Awareness Programs	High	Ongoing		Emergency Management		
Identify funding resources for mechanisms to disseminate information to the public regarding winter weather safety, preparedness, and mitigation activities.	2015	Ongoing	The Health Dept. is continually looking for ways to fund its programs.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
Utilize various methods of mass and social media to inform and educate the public regarding winter weather safety, preparedness, and mitigation activities.	2015	Ongoing	The Health Department continually provides materials for the public on health related issues.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
<b>Increase public awareness on mitigating the effects and damage from severe weather</b>										
Include winter weather information in preparedness outreach and campaigns	2015	Ongoing	OEM provides information and conducts presentations regarding all types of severe weather.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
Research and utilize social media to share weather forecasts & winter safety information	2015	Ongoing	Capabilities have been expanded to include mass notification and social media. New means will be researched and utilized as they are developed.	Education and Awareness Programs	Medium	Ongoing		Emergency Management		
<b>Increase resiliency of and reduce the damage due to the release of hazardous materials resulting from facilities damaged by the effects of winter weather</b>										
Ensure personnel have proper training (SDS, Hazcom, HAZWOPER, etc.) to respond and mitigate the damage from hazardous material release due to facility damage by the effects of winter weather	2020	New	This training is provided on a regular basis, but funding sources to provide the training is researched.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
Provide training on methods to secure hazardous materials against release due to facility damage by the effects of winter weather	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown

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
Research training and funding for training for methods and best practices to respond and mitigate the damage from hazardous materials released due to facility damage by the effects of winter weather	2020	New	Different departments within KCMO follow white sheets and other information regarding best practices. Funding for expanded mitigation measures would be accepted.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
Research training and funding for training for methods and best practices to secure hazardous materials from release due to facility damage by the effects of winter weather	2020	New	Such training is provided on a continuous basis. Further research is needed on best practices and lessons learned. This information could then be incorporated into KCFD training.	Education and Awareness Programs	High	Undetermined		Fire Dept	Unknown	Unknown
<b>Mitigate KCMO facility damage from winter weather and its effects.</b>										
Research mechanisms and funding to increase building resiliency to damage from winter weather elements such as extreme cold, snow, and ice.	2020	New	This action to be accomplished as time and resources allow.	Structure and Infrastructure Projects	Medium	Undetermined		public works	Unknown	Unknown
<b>Mitigate possible public injury resulting from winter ice sports</b>										
Disseminate information to the public on the danger of bodies of water unsuitable for conducting ice sports	2015	Deferred	Activity on the ice has been prohibited due to liability issues.	Education and Awareness Programs	Low	Deferred				
Identify and conduct training for personnel to enhance the capabilities of detecting ice thickness/safety of various lakes and ponds for ice sports	2015	Deferred	Training for personnel is continual and refreshed constantly.	Education and Awareness Programs	Low	Ongoing				
Identify and implement enhanced methods of conducting testing of ice thickness on various lakes and ponds	2015	Deferred	Activity on the ice has been prohibited due to liability issues.	Education and Awareness Programs	Low	Deferred				



<b>Archie R-V School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Disseminate information to Board of Education, district staff, parents, patrons and students regarding the threat of severe weather and preventative measures that can be taken to mitigate the hazards associated with severe weather.</b>										
Educate parents, patrons regarding severe storm safety	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Cost is negligible, benefit is saving of life	Board of Education	Low	District
<b>Educate Board of Education, district staff, parents, patrons and students about the necessity of severe weather planning at school and at home.</b>										
Educate Parents and patrons regarding severe storm safety.	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Cost is negligible, benefit is saving of life	Board of Education	Low	District

<b>Blue Springs School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Improve student safety from natural and man-made hazards.</b>										
Improve Tornado Preparedness with the construction of storm shelters	2015	Ongoing		Structure and Infrastructure Projects	High	2025	Protect students and patrons in case of tornadic weather.	Blue Springs School District	\$6.6m	Local/Federal 75/25%

<b>Excelsior Springs School District 2020 Mitigation Strategy (New Plan Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Improve student safety from natural and man-made hazards.</b>										
Construct safe rooms in elementary and high school buildings	2020	New	HMPG application submitted	Structure and Infrastructure Projects	High	2 years	Costs of constructing storm shelters would be high but the benefits outweigh the cost when increased student and community safety is considered.	Excelsior Springs School District	High	Local/Federal
Establish, maintain and communicate an effective crisis management plan.	2020	Ongoing	Adopted plan November 2019	Local Plans and Regulations	High	Ongoing	High payback, low cost	Excelsior Springs School District	Low	District funds

<b>Fort Osage R-1 School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Continuity of Services</b>										
Develop and institute a disaster recovery plan for continuity of student and business services	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Expect benefit by saving lives and enable district to maintain operations	District Administration	500000	Operational funds or bond sale
Increase the capacity for communicating the potential of tornadic activity in a timelier manner.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Save lives	District Administration	0	N/A
The district will insure staff and students conduct tornado drills during the school year.	2020	Ongoing					Knowledge should result in lives saved	District and building level teams	Low	Existing
<b>Protect students and staff during severe weather with safe rooms or storm shelter spaces.</b>										
Analyze space in existing school buildings and determine if retrofit of existing structures are possible or to design new space in existing or future new schools. Construct safe rooms or shelters as appropriate.	2020	New		Structure and Infrastructure Projects	High		Will result in lives saved	District Administration	Low	FEMA grant and school district funding
<b>Severe Thunderstorms</b>										
<b>Continuity of Services</b>										
Continuity of services	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Expect benefit by saving lives and enable district to maintain operations	District and building level teams	500000	Sale of bonds or use of designated operating funds
<b>The district will insure staff and students conduct severe weather drills during the school year.</b>										
Increase capacity for communication	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Knowledge should result in lives saved	District and building level teams	200000	Sale of bonds or use of designated operating funds
<b>Severe Winter Weather</b>										
<b>Continuity of Services</b>										
Develop and institute a disaster recovery plan for continuity of student and business services	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Knowledge should result in lives saved	District and building level teams	500000	Operational funds or bond sale
Increase the capacity for communicating the potential of severe winter weather in a timelier manner.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Knowledge should result in lives saved	District and building level teams	0	N/A
The district will develop strategies for insuring the safety of staff and students during severe winter weather	2020	Ongoing		Local Plans and Regulations	High	Ongoing	Knowledge should result in lives saved	District and building level teams	Low	Existing

<b>Grain Valley School District 2020 Mitigation Strategy (New Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase the safety of students, employees and visitors at the high school with additional shelter space.</b>										
Prepare an application for FEMA Mitigation or Pre-Disaster Mitigation grant funds to construct a shelter at the high school.	2020	New	The high school has limited shelter space during severe weather.	Structure and Infrastructure Projects	High	2024	Lives saved	Grain Valley School District	High	FEMA and school district matching resources
<b>Severe Thunderstorms</b>										
<b>Increase shelter capacity at the high school location that would be open to the community during severe weather/tornado.</b>										
Prepare an application for FEMA Mitigation or Pre-Disaster Mitigation grant funds to construct a shelter at the high school.	2020	New	The high school has limited shelter space during severe weather.	Structure and Infrastructure Projects	High	2024	Lives saved	Grain Valley School District	High	FEMA and school district matching resources

<b>Harrisonville School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Severe Thunderstorms</b>										
<b>Educate district staff, parents and students about the necessity of severe weather planning at school and at home.</b>										
Obtain and distribute educational brochures to help staff, students and families become more aware of the dangers of severe thunderstorms and ways they can protect themselves.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low cost approach to increase awareness of actions people can take to prevent injury, death and property damage from severe thunderstorms.	Emergency Preparedness Training and Communications	Very low cost	District Budget
Initiate ongoing training and awareness of district staff and students.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low cost approach to increase awareness of actions people can take to prevent injury, death and property damage from severe thunderstorms.	Emergency Preparedness Training and Communications	Very low cost	District Budget
<b>Tornadoes</b>										
<b>Educate district staff, parents and students about the necessity of severe weather planning at school and at home.</b>										
Obtain and distribute educational brochures to help staff, students and families become more aware of the dangers of severe thunderstorms and ways they can protect themselves.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low cost approach to increase awareness of actions people can take to prevent injury, death and property damage from tornadoes.	Emergency Preparedness Training and Communications	Very low cost	District Budget
Initiate ongoing training and awareness of district staff and students.	2010	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low cost approach to increase awareness of actions people can take to prevent injury, death and property damage from tornadoes.	Emergency Preparedness Training and Communications	Very low cost	District Budget
<b>Continue to train students and staff for various disaster situations.</b>										
Develop protocols for visitors to district buildings.	2015	Ongoing	Tornado procedures updated; lockdown procedures	Local Plans and Regulations	High	Ongoing	This action will provided us with consistent practices for the arrival and departure of district visitors during school hours/business hours.	District and Building Administration	0	N/A
Design and build secure entries to district buildings.	2015	Ongoing	Two buildings have secure entrance vestibules; assess/update video surveillance annually	Structure and Infrastructure Projects	High	Ongoing	This action will provided us with building entrances that allow for safe arrival and departure of visitors, and it will assist with the maintainence of secure facilities.	District and Building Administration	50,000-100,000	Local District Funds

Independence School District 2020 Mitigation Strategy (Continuing Plan 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
<b>Tornadoes</b>										
<b>Improve student safety from natural and man-made hazards.</b>										
Construct a storm shelter	2015	Ongoing	Due to costs and budgetary constraints, we have not constructed any new storm shelters through our district that are available for use.	Structure and Infrastructure Projects	High	Ongoing	Add to new facilities as we can	ISD 30	High	District/Levy/Bond
Implement use of interoperable radio on City emergency system	2015	Completed	We have replaced all building level radios in the district to enhance communication with our director of public safety. He has direct communication with the City of Independence Emergency Management Staff.	Structure and Infrastructure Projects	High	2 years	Implement district wide	ISD 30	50000	District Capital

<b>Kansas City School District #33 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Safety procedures have been updated for SY15 to increase safety using new recommendations. Increase Safety Drill participation and evaluate for effectiveness.</b>										
Review and implement safety drills and evaluate them for effectiveness	2015	Ongoing		Education and Awareness Programs	High	Annually	Safety drills are placed on a monthly calendar for execution. Reported drills are reviewed regularly with Principals and School Leadership. The only cost is the salaried manpower to evaluate the execution of the drill. The benefit is unmeasurable for the protection of life.	KCPS Safety and Security in conjunction with Risk Management	Low	Funding is maintained as an operational budgeted item
<b>Severe Winter Weather</b>										
<b>Refine procedures to respond to severe winter weather to ensure the continuation of regular activities while providing a safe and comfortable environment.</b>										
Snow removal, surface treatment, vehicle and equipment maintenance, facility maintenance to ensure safe environments	2015	Ongoing		Unspecified	High	Annually	Cost benefit result is in the reduction of liability claims against the District and increase the safety of all	KCPS Operations Department	5,271,000	Operating budget



<b>Lawson School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Improved Safety for students, staff, and community from Tornado hazard.</b>										
Construction of FEMA 361 Compliant Safe Room for the High School/Middle School Campus	2015	Ongoing	Construction is currently in progress. Expected Completion is June 2020. Funded entirely with local funds.	Structure and Infrastructure Projects	High	30-Jun-20	Lives saved	District Board and Administration	\$3.8 Million	Local only
Construction of FEMA 361 Safe Room for the Southwest Elementary School Campus	2015	Ongoing	Currently in Grant Application stage; Grant completed and submitted to SEMA on February 3, 2020. Expected application approval in 3rd quarter of 2020.	Structure and Infrastructure Projects	High	Jan-22	Lives saved	District Board and Administration	\$3.1 Million	Local plus HMGP Grant

Lee's Summit School District 2020 Mitigation Strategy (Continuing Plan 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
<b>Tornadoes</b>										
<b>Evaluation and Enhancement of Sheltering Areas.</b>										
Enhancement/Redefinement of Sheltering areas. Add shelters in new buildings as appropriate.	2015	Ongoing	The district continues to monitor its existing shelter areas to determine needs for changes in existing sheltering space	Structure and Infrastructure Projects	Low	Unknown	The cost of such a structural modification or add on will most greatly outweigh the estimated use. Such a project would need to be a needed functional space that can be used as a sheltering area.	Safety/Facility Services	High	FEMA grants and school district funds
Evaluate current sheltering needs	2015	Ongoing	The district continues to monitor its existing shelter areas to determine needs for additional space	Local Plans and Regulations	Medium	Within the next 5 years.	Evaluation of current sheltering needs to determine if our areas can adequately shelter our school populations should be done every couple of years. There is no cost associated and it is always beneficial to review asset capabilities.	Facility Services	Low	District

<b>Metropolitan Community College 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>MCC Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Severe Thunderstorms</b>										
<b>Protect human lives, property and mitigate injuries.</b>										
Ensure communication channels are working properly between Police Department and other college departments, such as Facilities and Information Technology, to implement equipment or perform maintenance to reduce damage to property and protect lives.	2015	Ongoing		Structure and Infrastructure Projects	Medium	2-3 years	Working with Facilities to maintain landscaping and install lightning protection on campus and college thoroughfares would incur additional funding but ensures a reduction in repair costs. Implementing/Updating surveillance equipment across the district	MCC	25000	MCC
Ensure MCC emergency response procedures are reviewed and employees trained annually.	2015	Ongoing		Education and Awareness Programs	Medium	1-2 years	MCC has existing procedures but a process needs to be in place to consistently reeducate to ensure the safety of it's constituents. 80% complete	MCC	0	MCC
Upgrade and integrate communications system to provide capability to communicate across jurisdictional lines between MCC and other law enforcement agencies and emergency service providers (i.e. Mutual Aid capabilities)	2015	Ongoing		Structure and Infrastructure Projects	Medium	3-6 years	The exact cost of the upgrade is unknown at this time. The upgrade will support a variety of configurations, allowing a more expeditious and coordinated response effort from multiple agencies spanning a large geographical area. It will decrease response time.	MCC	182,300	State/Federal Grants

<b>North Kansas City School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>To ensure the best possible severe weather sheltering possible.</b>										
Reassess sheltering locations and if appropriate add safe rooms or shelters to existing buildings or as new buildings are planned and built	2015	Ongoing		Structure and Infrastructure Projects	Medium	Ongoing	Reduce potential for loss of life	Safety & Security	Low	District
<b>Floods</b>										
<b>To improve our evacuation response and reduce potential damage due to flooding.</b>										
Improve response to possible flooding from levee failure at NKCHS	2015	Ongoing		Structure and Infrastructure Projects	Low	Ongoing	Reduce potential for loss of life	NKCPD, Safety & Security	Low	District

<b>North Platte R-1 School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Improve student safety from natural and man-made hazards at all District campuses.</b>										
As funding allows, construct safe rooms to improve student safety from natural and man-made hazards at all District campuses.	2015	Ongoing		Structure and Infrastructure Projects	High	Annually review during July Board of Education meeting. If funding sources allow, complete application for SEMA grant.	The construction of a school community safe room on the Dearborn campus and Camden Point campus would allow a safe area in the event of severe weather.	Board of Education / Superintendent	High	75% SEMA; 25% Local match

<b>Oak Grove R-VI School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Construct a district storm shelter, revise severe weather policies, conduct additional drills.</b>										
Construct a district storm shelter, revise severe weather policies, conduct additional drills	2015	Ongoing		Structure and Infrastructure Projects	High	3 years	Revise policies and procedures and conducting additional drills would require no additional cost. \$2 to 3 million dollars was estimated as a storm shelter cost. While the cost is significant, the benefits far outweigh the cost.	Oak Grove R-VI School District Superintendent and Board of Education	High	District capital projects funds and FEMA/SEMA grant funding
Review and revise and effective crisis management plan	2015	Ongoing		Local Plans and Regulations	High	3 years	Employing outside services for assistance is costly. The revisiting of existing crisis management committee and existing plan will result in a program that will adequately serve the needs of the district utilizing existing resources.	School District Administration and SRO	Low	District funds

<b>Park Hill School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Increase safety of students, staff and visitors from severe weather by adding shelter space.</b>										
Seek Mitigation grant to add storm shelters to existing sport stadiums	2020	New		Structure and Infrastructure Projects	Medium	2025	Lives saved	Park Hill Board of Education/District	High	FEMA grant and local match
<b>Ensure a safe, caring environment for students, staff and visitors.</b>										
Purchase a portable, three-phase generator to supply electrical power in case of an emergency.	2010	Ongoing	Maintain three-phase generator	Structure and Infrastructure Projects	High	Ongoing	Would ensure electrical power continuity for a variety of threats/hazards.	Park Hill Board of Education/District	Low	District

<b>Park University 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Perform a campus-wide Tornado Drill in April of each year.</b>										
Coordinate campus-wide tornado drill in the month of April each year after Goal 1 is complete. Optional: Coordinate with City of Parkville to hold drill on same date as city-wide tornado drill.	2015	Ongoing		Education and Awareness Programs	High	Ongoing	Campus-wide emergency response preparation - drill will identify strengths and weaknesses of planned procedures and allow for any weaknesses to be addressed.	EHS Compliance Coordinator	Low	N/A
<b>Post Emergency Evacuation Routes in all buildings and update as needed.</b>										
Coordinate with local NWS personnel to ensure chosen Storm Shelter locations are acceptable.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Providing the best shelter locations possible in each campus building to ensure the best protection available in the event of a tornado or severe weather emergency.	EHS Compliance Coordinator	Low	Campus Safety Payroll Budget
Print, laminate, and post evacuation maps at strategic locations in all buildings.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Providing /making available emergency evacuation/shelter information to the campus community.	EHS Compliance Coordinator	Low	Campus Safety Payroll Budget and EHS Budget
Review current emergency evacuation routes and maps for accuracy and feasibility.	2015	Ongoing		Local Plans and Regulations	High	Ongoing	Ensuring that all spaces within a building are accounted for and accurately planning evacuation routes. Losses avoided include submitting inaccurate information to campus community, thus causing confusion during an actual emergency.	EHS Compliance Coordinator	Low	Campus Safety Payroll Budget



<b>Platte County R-3 School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
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
<b>Tornadoes</b>										
<b>Improved Safety for students, staff and community from hazard of tornado.</b>										
Conduct emergency drills throughout district (severe weather, fire, intruder, earthquakes)	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Avoid injury, loss of life.	Platte County R-3 School District Administration	Low	School District Budget
<b>Consider sheltering options for students, staff and visitors during tornadoes and other natural hazards.</b>										
Investigate the cost of adding storm shelters to our existing facilities.	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Cost of shelters would be significant however this approach is the best way of keeping people safe during a tornado. Many lives would be saved.	Platte County R-3 School District Administration	High	TBD
<b>Severe Winter Weather</b>										
<b>Improve communications to all stakeholders for severe winter weather situation.</b>										
Develop a comprehensive communication plan when severe winter weather causes the district to close.	2015	Completed	Revised District and School Crisis Plans	Local Plans and Regulations	High	2019-2020 school year	Avoid injury, loss of life.	Platte County R-3 School District Administration	Low	School District Budget

<b>Pleasant Hill R-III School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Disseminate information to patrons based upon survey information</b>										
Meet with school personnel regarding school district safety and emergency preparedness	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Cost is minimal but information will be invaluable for students, staff and patrons.	School Board	Low	District
Initiate ongoing information dissemination and awareness for the district's staff, parents and patrons during faculty and staff in-service	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Cost is minimal but information will be invaluable for students, staff and patrons.	School Board	Low	District
<b>Educate Board of Education, district staff, parents, patrons and students about the necessity of severe weather planning at school and at home.</b>										
Create an electronic survey to be sent home annually to parents and present safety information to parents, staff and Board of Education.	2010	Ongoing		Education and Awareness Programs	High	Ongoing	Cost is minimal but information will be invaluable for students, staff and patrons.	School Board	Low	District
<b>Upgrade storm sheltering capacities and facilities in the district.</b>										
Construct tornado safe rooms in district facilities.	2015	Ongoing		Structure and Infrastructure Projects	High	3 to 5 years	\$4 million cost. Benefit would to better shelter our students, staff and patrons in the event of severe weather.	School Board	High	FEMA Grant/Local Funds

<b>Raymore-Peculiar School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Increase public awareness and understanding the benefits of "safe rooms."</b>										
Develop, distribute informational materials on safe rooms.	2015	Ongoing		Education and Awareness Programs	Medium	Ongoing	Low cost mechanism to increase student safety.	Ray-Pec District Administration	Low	District
<b>Severe Thunderstorms</b>										
<b>Maintain current weather alert systems in all district facilities.</b>										
Test, monitor, and repair all weather alert systems annually.	2015	Ongoing		Structure and Infrastructure Projects	High	Ongoing	Will ensure proper function of alerting systems.	Ray-Pec District Administration	Low	District

<b>Smithville R-II School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>To protect the health and safety of students, employees, and community members from natural and man-made hazards</b>										
Improve Tornado Preparedness by Construct a storm shelter/Safe Room. • Implement tornado readiness and response procedures in curriculum. • Conduct additional drills. (Tornado, Intruder, Fire)	2010	Ongoing	Constructed a storm shelter at the high school	Structure and Infrastructure Projects	High	Ongoing	Conducting additional drills would not require additional funding, however we feel that two drills per year is sufficient for students in grades 6 through 12, and a minimum of four drills are required for students in grades kindergarten through fifth.	Board of Education, Superintendent	Low	District Funding

<b>West Platte R-II School District 2020 Mitigation Strategy (Continuing Plan Participant)</b>										
<b>West Platte R-II SD Mitigation Goals and Action Steps</b>	<b>Plan Year</b>	<b>Status of Project</b>	<b>Status Explanation</b>	<b>Type of Mitigation Activity</b>	<b>Priority</b>	<b>Date of Completion</b>	<b>Cost/Benefit Review</b>	<b>Primary Agency Responsible for Implementation/Administration</b>	<b>Estimate of Cost (\$)</b>	<b>Funding Source</b>
<b>Tornadoes</b>										
<b>Improved Safety for students, staff and community from hazard of tornado.</b>										
Consider including the Construction of a "hardened shelter" as part of the upcoming capital improvement project.	2010	Completed	Elementary gymnasium was built to FEMA standards and is said to have the ability to withstand a direct hit from a tornado.	Structure and Infrastructure Projects	Medium	2017-2018	Avoid injury, loss of life.	West Platte District	High	District Capital Projects Budget/FEMA Grant
<b>Severe Thunderstorms</b>										
<b>Improved Safety for students, staff and community from hazard of severe thunderstorms.</b>										
Consider including the Construction of a "hardened shelter" as part of the upcoming capital improvement project.	2010	Completed	Elementary gymnasium was built to FEMA standards and is said to have the ability to withstand a direct hit from a tornado.	Structure and Infrastructure Projects	Medium	2017-2018	Avoid injury, loss of life.	West Platte District	High	District Capital Projects Budget/FEMA Grant

## Section 6: Plan Maintenance

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## Section 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 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 three Kansas counties – Johnson, Leavenworth and Wyandotte. Beginning in 2021, the MEMC will review both the plan adopted for the three Kansas counties and this Plan for updates. The Hazard Mitigation Plan Committee will meet with Kansas representatives to discuss preparing an integrated plan for the bi-state metro area 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 2020 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 1.1**.

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 included in the annual work plan for 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.

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 1.2**. 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 1.2**. 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 1.1** 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*: Begin advertising meeting dates and times for 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 meetings 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*: Advertise and conduct 1<sup>st</sup> round of public meetings.

**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-8 months:**

- 1.) *MARC/Planning Team/Participating Jurisdictions*: Advertise and conduct 2<sup>nd</sup> round of public meetings/public input opportunities.

**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.

**Table 6.1** identifies data deficiencies from the 2015 Plan. This list must be evaluated, and deficiencies can be added or deleted. If progress has been made, the status should be updated in **Table 1.2** in **Section 1: Introductions and Planning Process Section**. Upon evaluation, Item 10 from the 2015 Plan is removed from this list. Item 10 identified data deficiencies regarding the number of cases and deaths related to true outbreaks of emerging or re-emerging infectious diseases. Better information sharing is occurring with the recent COVID-19 pandemic among jurisdictions and health agencies.

<b>Table 6.1: Data Deficiencies Identified From the 2015 Plan</b>		
<b>Data Deficiency</b>	<b>Action to Be taken</b>	<b>Responsible Party</b>
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	Incorporate future land use maps for Ray County as developed	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 currently have access to this data at present	Through collaboration with jurisdictions and utility companies are working to address this.	Planning Team, MARC
6. Data regarding homes without basements –	The next time MARC asks for a parcel update will 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 but will not be able to keep it current.	As jurisdictions develop GIS capabilities this information will be incorporated in future updates.	Participating Jurisdictions

<b>Data Deficiency</b>	<b>Action to Be taken</b>	<b>Responsible Party</b>
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 become more accessible.	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.	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 the 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 this plan will be provided to the following public libraries or library systems serving the participating jurisdictions:

**Ray County Library**

215 East Lexington  
Richmond, MO 64085

**Kansas City Public Library**

14 West 10th Street  
Kansas City, MO

**Mid-Continent Public Libraries**

(Administrative Headquarters, serving Jackson, Platte and Clay Counties)  
15616 East 24 Highway  
Independence, MO

**Cass County Libraries**

(Administrative offices)  
400 E. Mechanic St.  
Harrisonville, MO 64701

Copies of the plan will also be available from MARC and from the participating jurisdictions. In addition, this plan will be posted on MARC's website and the websites of participating jurisdictions, if possible. 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 aforementioned websites.

The availability of this plan will also be publicized in MARC's printed, online and electronic newsletters, such as *Management Matters* and through MARC's social media. Participating jurisdictions will also publicize the availability of this plan in community newsletters and related publications as well as advertising on community TV channels. 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**.

## **APPENDIX A: ADOPTION RESOLUTION**

The local jurisdictions listed below have adopted the 2020 Regional Hazard Mitigation Plan with local goals and strategies identified. Local jurisdictions were asked to adopt the plan following SEMA review and the completion of any needed changes. Local jurisdictions are working on adoption during summer 2020, with some delayed due to COVID-19.

### **2020 Plan Participants**

City of Grandview (Jackson County)  
City of Lee's Summit (Jackson County)

City of Kearney (Clay County)  
City of North Kansas City (Clay County)  
Excelsior Springs School District #40 (Clay County)

City of Lake Waukomis (Platte County)  
City of Weston (Platte County)

**Adopted Resolutions are included in this Appendix. A Sample Resolution is attached.**

The **2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray counties** has been prepared with input from local government, school district and other community stakeholders and the public. The final plan is posted on the Mid-America Regional Council website at <https://www.marc.org/Emergency-Services-9-1-1/MEMC/Activities/2020-Hazard-Mitigation-Plan>

Participating jurisdictions must adopt the plan, which includes an analysis of their jurisdictions' risk to natural hazards and goals and actions that the jurisdictions have identified to take over the next 5 years to mitigate impacts from such disasters. Each participating jurisdiction has been asked to seek approval by their governing body. The following is a sample resolution.

## Sample Resolution

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

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

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

WHEREAS the (local governing body/school district ) has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray counties, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

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

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

WHEREAS adoption by the (local governing body/school district) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan* and affirms that the Plan will be updated no less than every five years; and

WHEREAS the final draft plan prepared by the Mid-America Regional Council has been reviewed by SEMA and is expected to be approved by FEMA.

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT/SCHOOL DISTRICT), in the State of Missouri, the (local governing body/school district) adopts the final draft *Plan*.

ADOPTED by a vote of \_\_\_ in favor and \_\_\_ against, and \_\_\_ abstaining, this day of \_\_\_\_\_, 2020.

By (Sig): \_\_\_\_\_

Print name: \_\_\_\_\_




CITY OF GRANDVIEW

Res. 2020-08  
REQUEST FOR BOARD ACTION

INTRODUCED FIRST READING	SECOND READING	THIRD READING
LOST	TABLED	PASSED

Date: June 9, 2020

<b>Agenda Section:</b> V. CONSENT AGENDA	<b>Item:</b> J.	<b>Originating Department:</b> Community Development <b>By:</b> Chris Chiodini, AICP, Director ACC
A Resolution of the City of Grandview, Missouri adopting the Mid-America Regional Council 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray Counties.		Approved for Agenda By:  Cemal Umut Gungor City Administrator

**I. REPORT IN BRIEF:**

The Board of Aldermen is requesting to adopt the attached Resolution which would adopt the Mid-America Regional Council (MARC) 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray Counties.

**II. BACKGROUND:**

In 2010, Mid-America Regional Council (MARC) became the regional coordinator for the development of the Regional Multi-Jurisdictional Hazard Mitigation Plan. The development of this Plan has been accomplished in accordance with the Disaster Mitigation Act of 2000. This Plan is a compilation of goals and actions, designed to reduce or eliminate long-term risk to people and property from future hazards and disasters. The Plan is updated every five (5) years, was last updated in 2015, and is required to be updated on this schedule to be eligible to apply for certain FEMA grants.

**III. REPORT:**

The work to develop the 2020 Update started in May 2019 with the City forming a Committee with representation from each Department. The City's work was completed in October 2019 and the Plan was submitted to the State Emergency Management Agency (SEMA) and to MARC in October 2019 for review and comment. Each City that participates in the update of this Plan is asked to have their elected officials adopt a Resolution.

**IV. RECOMMENDATION:**

Staff recommends the Board of Aldermen adopt the attached Resolution.

# CITY OF GRANDVIEW

## RESOLUTION NO. 2020-08

### **A RESOLUTION OF THE CITY OF GRANDVIEW, MISSOURI, ADOPTING THE MID-AMERICA REGIONAL COUNCIL 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR CASS, CLAY, JACKSON, PLATTE AND RAY COUNTIES.**

WHEREAS, the Board of Aldermen (“Board”) of the City of Grandview, Missouri (“City”) recognizes the threat that natural hazards pose to people and property within the City; and

WHEREAS, the City has participated in preparation by the Mid-America Regional Council (“MARC”) of a multi-jurisdictional local hazard mitigation plan, known as the 2020 Multi-Jurisdictional Mitigation Plan for Cass, Clay, Jackson, Platte and Ray Counties (“the Plan”), in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Plan includes mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City from the impacts of future hazards and disasters; and

WHEREAS, because the Board recognizes that land use and other policies have a major impact on whether people and property are exposed to natural hazards, the City endeavors to integrate the Plan into the comprehensive and/or strategic planning process; and

WHEREAS, adoption of the Plan by the Board demonstrates the City’s commitment to hazard mitigation and to achieving the goals outlined in the Plan and affirms that the Plan will be updated no less than every five years; and

WHEREAS, the Plan was submitted by MARC to the State Emergency Management Agency (“SEMA”) for review and is expected to be approved by the Federal Emergency Management Agency (“FEMA”); and

WHEREAS, the Board deems it to be in the best interest of the citizens of Grandview to adopt the Plan.

NOW, THEREFORE, IT IS HEREBY RESOLVED BY THE BOARD OF ALDERMEN OF THE CITY OF GRANDVIEW, MISSOURI, AS FOLLOWS:

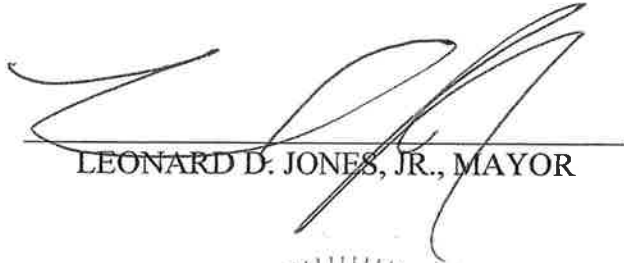
Section 1. Hazard Mitigation Plan Adopted. The City of Grandview, Missouri, hereby adopts the 2020 Multi-Jurisdictional Mitigation Plan for Cass, Clay, Jackson, Platte and Ray Counties.



Section 2. Effective Date. This Resolution shall be effective upon its passage and execution by the Mayor.

Passed this 9th day of June 2020.

Approved this 9th day of June 2020.

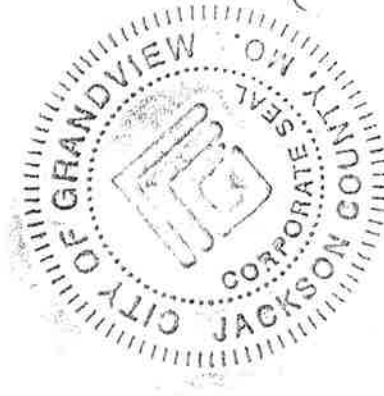


LEONARD D. JONES, JR., MAYOR

ATTEST:



BECKY SCHIMMEL, CITY CLERK



## RESOLUTION 20-08

A RESOLUTION TO ADOPT THE 2020 REGIONAL MULTI-HAZARD MITIGATION PLAN.

WHEREAS, the City of Lee's Summit through the Lee's Summit Fire Department, with the assistance from the Mid-America Regional Council, has gathered information and prepared the Regional Multi-Hazard Mitigation Plan; and,

WHEREAS, the Regional Multi-Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Lee's Summit is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and,

WHEREAS, the City of Lee's Summit has reviewed the Plan and affirms that the Plan will be updated no less than every five years; and,

WHEREAS, the City of Lee's Summit adopted The 2015 Regional Multi-Hazard Mitigation Plan with Resolution No. 15-12 on September 17, 2015.


NOW THEREFORE BE IT RESOLVED BY THE COUNCIL OF THE CITY OF LEE'S SUMMIT AS FOLLOWS:

SECTION 1. That the Regional Multi-Hazard Mitigation Plan on file with the City of Lee's Summit City Clerk's Office which is incorporated by reference as if fully set forth herein is hereby approved and adopted by the City of Lee's Summit as its Hazard Mitigation Plan, and resolves to execute the actions in the attached Regional Multi-Hazard Mitigation Plan.

SECTION 2. That any resolutions or part thereof that conflict this resolution or part thereof are hereby rescinded.

SECTION 3. This resolution shall be in full force and effect from the date of its passage, adoption, and approval by the Mayor.

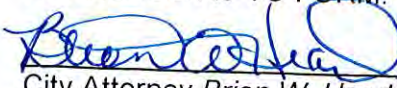
PASSED and ADOPTED by the City Council for the City of Lee's Summit, Missouri, this 14<sup>th</sup> day of April, 2020.

  
\_\_\_\_\_  
Mayor William A. Baird

ATTEST:

  
\_\_\_\_\_  
City Clerk Trisha Fowler Arcuri

APPROVED AS TO FORM:

  
\_\_\_\_\_  
City Attorney Brian W. Head

RESOLUTION NO. 09-2020

**A RESOLUTION ADOPTING THE REGIONAL 2020 HAZARD MITIGATION PLAN**

**WHEREAS**, the City recognizes the threat that natural hazards pose to people and property within the Kearney area; and

**WHEREAS**, the City has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray counties, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

**WHEREAS**, the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City from the impacts of future hazards and disasters; and

**WHEREAS**, the City recognizes that land use and other policies have a major impact on whether people and property are exposed to natural hazards, the City will endeavor to integrate the *Plan* into the comprehensive and/or strategic planning process; and

**WHEREAS**, adoption by the City demonstrates a commitment to hazard mitigation and achieving the goals outlined in the *Plan* and affirms that the Plan will be updated no less than every five years; and

**WHEREAS**, the final draft plan prepared by the Mid-America Regional Council has been reviewed by SEMA and is expected to be approved by FEMA.

**NOW THEREFORE BE IT RESOLVED BY THE BOARD OF ALDERMEN OF THE CITY OF KEARNEY, MISSOURI, AS FOLLOWS:**

The City of Kearney hereby adopts the regional *2020 Hazard Mitigation Plan* as its Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

**PASSED AND RESOLVED BY THE BOARD OF ALDERMEN OF THE CITY OF KEARNEY, MISSOURI, AND APPROVED BY THE MAYOR THIS 16th DAY OF MARCH, 2020.**

APPROVED:

Randy Pogue, Mayor

ATTEST:

Jim Eldridge, City Clerk





## RESOLUTION NO. 20-034

### A RESOLUTION ADOPTING THE REGIONAL HAZARD MITIGATION PLAN BY THE CITY OF NORTH KANSAS CITY, MISSOURI

**WHEREAS**, the City of North Kansas City, Missouri (the "City") is a third class city and political subdivision duly organized and validly existing under the Constitution and laws of the State of Missouri; and

**WHEREAS**, the City, along with other jurisdictions in Cass, Clay, Jackson, Platte and Ray Counties, periodically updates the Regional Multi-Hazard Mitigation Plan in order to sustain actions designed to reduce or eliminate long-term risk to people or property from natural and other hazards; and

**WHEREAS**, the City of North Kansas City now desires to adopt the updated the 2020 Multi-Jurisdictional Hazard Mitigation Plan as part of the City's overall plan for the protection of people and property from natural and other hazards.

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of North Kansas City, Missouri, as follows:

**Section 1. Adoption of Regional Hazard Mitigation Plan.** The City Council hereby formally adopts the updated Regional Multi-Hazard Mitigation Plan, a copy of which can be viewed and downloaded from <https://www.marc.org/Emergency-Services-9-1-1/MEMC/Activities/2020-Hazard-Mitigation-Plan> and incorporated herein by reference. The City Council further directs that the 2020 Multi-Jurisdictional Hazard Mitigation Plan be implemented and followed by the City as set forth therein. Where applicable, the Regional Multi-Hazard Mitigation Plan shall be the guide for managing covered hazards. The provisions of the Regional Multi-Hazard Mitigation Plan are hereby approved and adopted by the City Council of the City of North Kansas City, Missouri. To the extent necessary, the Mayor and City Administrator are hereby authorized to execute the Regional Multi-Hazard Mitigation Plan on behalf of the City.

**Section 2. Further Authority.** The City shall, and the mayor, city clerk, city officials and employees of the City are hereby authorized and directed to take such further action, and execute such other documents, certificates and instruments as may be necessary or desirable to carry out and comply with the intent of this Resolution.

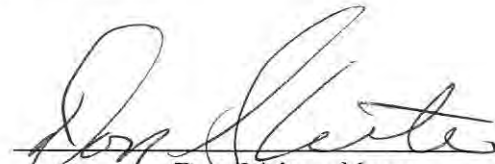
**Section 3. Severability.** The sections, paragraphs, sentences, clauses and phrases of this Resolution shall be severable. In the event that any such section, paragraph, sentence, clause or phrase of this Resolution is found by a court of competent jurisdiction to be invalid, the remaining portions of this Resolution are valid, unless the court finds the valid portions of this Resolution are so essential to and inseparably connected with and dependent upon the void portion that it cannot be presumed that the City has enacted the valid portions without the void ones, or unless the court finds that the valid portions, standing alone, are incomplete and are incapable of being executed in accordance with the legislative intent.

**Section 4. Governing Law.** This Resolution shall be governed exclusively by C and construed in accordance with the applicable laws of the State of Missouri.

**Section 5. Effective Date.** This Resolution shall be in full force and effect from and after its passage by the City Council and approval by the Mayor.

**DONE** this 2nd day of June, 2020.

Attest:   
Crystal Doss, *City Clerk*

  
Don Stielow, *Mayor*

### Excelsior Springs School District #40

A resolution of the Excelsior Springs School District #40 adopting the Excelsior Springs School District #40 Hazard Mitigation Plan.

WHEREAS the Excelsior Springs School District #40 recognizes the threat that natural hazards pose to people and property within the (local community/school district area); and

WHEREAS the Excelsior Springs School District #40 has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray Counties, hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identified mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Excelsior Springs School District #40 from the impacts of future hazards and disasters; and

WHEREAS the Excelsior Springs School District #40 recognizes that land use and other policies have a major impact on whether people and property are exposed to natural hazards, the Excelsior Springs School District #40 will endeavor to integrate the Plan into the comprehensive and/or strategic planning process; and

WHEREAS adoption by the Excelsior Springs School District #40 demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan and affirms that the Plan will be updated no less than every five years; and

WHEREAS the final draft plan prepared by the Mid-America Regional Council has been reviewed by SEMA and is expected to be approved by FEMA.

NOW THEREFORE, BE IT RESOLVED BY THE EXCELSIOR SPRINGS SCHOOL DISTRICT #40, in the State of Missouri, in accordance with authorities granted to public school districts by the State of Missouri, the Excelsior Springs Board of Education adopts the draft Plan.

ADOPTED by a vote of 7 in favor and 0 against, and 0 abstaining, this 9<sup>th</sup> day of March, 2020.

By:   
Signature

Print Name: Charles (Tray) Harkins, III  
President, Board of Education

**RESOLUTION NO. 251**

**A RESOLUTION OF THE CITY OF LAKE WAUKOMIS ADOPTING THE 2020  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR PLATTE COUNTY**

WHEREAS the City of Lake Waukomis recognizes the threat that natural hazards pose to people and property within the City of Lake Waukomis; and

WHEREAS the City of Lake Waukomis has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray counties, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Lake Waukomis from the impacts of future hazards and disasters; and

WHEREAS the City of Lake Waukomis recognizes that land use and other policies have a major impact on whether people and property are exposed to natural hazards, the City of Lake Waukomis will endeavor to integrate the *Plan* into the comprehensive and/or strategic planning process; and

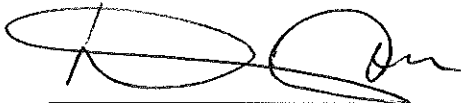
WHEREAS adoption by the City of Lake Waukomis demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan* and affirms that the Plan will be updated no less than every five years; and

WHEREAS the final draft plan prepared by the Mid-America Regional Council has been reviewed by SEMA and is expected to be approved by FEMA.

**II. RESOLUTION**

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF LAKE WAUKOMIS in the State of Missouri, in accordance with the local rule for adopting resolutions, the City of Lake Waukomis adopts the final draft *Plan*.

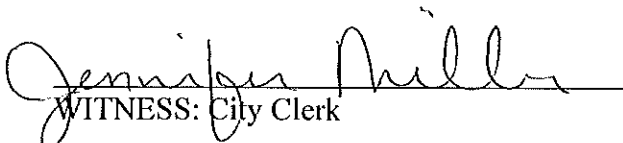
**III. EXECUTION/ADOPTION**



SIGNATURE OF Mayor

3-21-20

DATE



WITNESS: City Clerk

# City of Weston

MISSOURI

CITY OF WESTON RESOLUTION  
#2020 - 005

A RESOLUTION TO ADOPT THE 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Weston recognizes the threat that natural hazards pose to people and property within the Weston Community; and

WHEREAS, the City of Weston has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the 2020 Multi-Jurisdictional Hazard Mitigation Plan for Cass, Clay, Jackson, Platte and Ray counties, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Weston from the impacts of future hazards and disasters; and

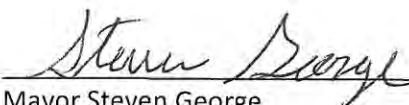
WHEREAS, the City of Weston recognizes that land use and other policies have a major impact on whether people and property are exposed to natural hazards, the City of Weston will endeavor to integrate the *Plan* into the comprehensive and/or strategic planning process; and

WHEREAS, adoption by the Weston Board of Aldermen demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan* and affirms that the Plan will be updated no less than every five years; and

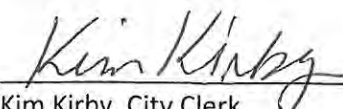
WHEREAS, the final draft plan prepared by the Mid-America Regional Council has been reviewed by SEMA and is expected to be approved by FEMA.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF WESTON, in the State of Missouri, in accordance with the laws of the City of Weston, the Board of Aldermen adopts the final draft *Plan*.

Adopted by a vote of 4 in favor and 0 against, and 0 abstaining, this 9<sup>TH</sup> DAY OF MARCH 2020.

  
\_\_\_\_\_  
Mayor Steven George

ATTEST:

  
\_\_\_\_\_  
Kim Kirby, City Clerk



## **APPENDIX B: SUPPORTING DOCUMENTS**

### **List of Files**

#### **I. Regional Authorizations**

- a. Metropolitan Emergency Managers Committee authorizing MARC to prepare the plan on behalf of Cass, Clay, Jackson, Platte and Ray counties, cities, school districts and other special districts.
- b. Mid-America Regional Council Board of Directors action to accept the SEMA grant and authorize the preparation of the plan on behalf of Cass, Clay, Jackson, Platte and Ray counties, cities, school districts and other special districts

#### **II. HMPC Meeting Info**

- a. Includes sign-in sheets, meeting summaries and agendas for planning meetings held throughout the update process.

#### **III. AGREEMENT WITH SEMA – FEMA-DR-MO-4317-0002**

- a. Exhibit D to memorandum of agreement for contractual services between SEMA and MARC

#### **IV. Public Participation Info**

- a. Includes meeting notices, fliers, press releases, advertisements, sign-ins, social media advertisements and posts, links to social networking sites, etc.



# MARC

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MID-AMERICA REGIONAL COUNCIL

BOARD OF DIRECTORS  
August 28, 2018  
12:15 p.m.  
Meeting Summary

## COMMITTEE MEMBERS PRESENT

Councilmember Carol Suter, Gladstone, Mo. - MARC Board Chair  
Commissioner Rob Roberts, Miami County, Kan. - MARC Board 1<sup>st</sup> Vice Chair  
Commissioner Jimmy Odom, Cass County, Mo. - MARC Board 2<sup>nd</sup> Vice Chair  
Commissioner Harold Johnson, Unified Government of Wyandotte County/KCK - MARC Board Treasurer  
Mayor Carson Ross, Blue Springs, Mo. - MARC Board Secretary  
Councilmember Curt Skoog, Overland Park, Kan. - MARC Board Immediate Past Chair  
Councilmember Marge Vogt, Olathe, Kan. - MARC Board Past Chair  
Commissioner Ron Shaffer, Johnson County, Kan. - MARC Board Past Chair  
Commissioner Jerry Nolte, Clay County, Mo.  
Legislator Scott Burnett, Jackson County, Mo.  
County Executive Frank White, Jackson County, Mo.  
Commissioner Dagmar Wood, Platte County, Mo.  
Mayor Eileen Weir, Independence, Mo.  
Councilmember Heather Hall, Kansas City, Mo.  
Councilmember Jermaine Reed, Kansas City, Mo.  
Councilmember Scott Wagner, Kansas City, Mo.  
Mayor Holly Stark, Peculiar, Mo.  
Commission Chairman Ed Eilert, Johnson County, Kan.  
Commissioner Bob Holland, Leavenworth County, Kan.  
Commissioner Doug Smith, Leavenworth County, Kan.  
Commissioner Angela Markley, Unified Government of Wyandotte County/KCK  
Councilmember Vernon Fields, Basehor, Kan.  
Mayor Mike Boehm, Lenexa, Kan.  
Mayor Paula Schwach, Westwood Hills, Kan.

## OTHERS PRESENT

Markus Smith, Councilmember Heather Hall's office

## STAFF PRESENT

Executive Director David A. Warm and other MARC staff

## INTRODUCTIONS AND BOARD SHARING TIME

Councilmember Carol Suter called the meeting to order at 12:15 p.m. Self-introductions were made and members shared items of interest from their jurisdictions.

#### RECOGNITION OF MARC EMPLOYEE

David Warm welcomed back his Executive Assistant Mary Laird, who was on extended medical leave.

#### AUTHORIZE A LETTER OF SUPPORT FOR EFFORTS TO BUILD A LAW ENFORCEMENT OFFICER MEMORIAL GARDEN IN CLAY COUNTY

Kansas City Councilwoman Heather Hall and former Police Commissioner John Dillingham are leading an effort to construct a memorial to honor area law enforcement personnel who lost their lives in the line of duty. Located behind the Kansas City Regional Police Academy at Pleasant Valley Parkway and Shoal Creek Parkway, the memorial will honor lives lost in Clay, Platte, Jackson and Cass counties, as well as state, federal, railroad and conservation officers. The Law Enforcement Memorial Garden will be open to the public and will provide a place of reflection and teaching tool for current residents and future generations. Private fundraising efforts for the \$3 million project are currently underway. More on the memorial garden can be found at <https://kclemg.org>. Councilwoman Hall made a presentation about the project and showed a short video. She asked the Board to authorize a letter of support.

**MOTION:** Commissioner Odom moved to authorize MARC to provide a letter supporting the city of Kansas City, Missouri's efforts to build a law enforcement officer memorial garden. It was seconded by Mayor Pro Tem Wagner and carried.

#### APPROVE CONTRACT WITH WESTAT TO CONDUCT A REGIONAL HOUSEHOLD TRAVEL SURVEY

Jim Hubbell, Principal Planner, reported that MARC periodically conducts regional household travel surveys to obtain detailed information about the socio-economic characteristics and travel behavior of persons living in the Greater Kansas City region. The information collected is used as the foundation for developing travel demand forecasts, a key requirement of federal metropolitan transportation planning regulations. The last regional household travel survey was completed in 2004, and since that time the region has experienced significant shifts in travel behavior due to changing demographics, generational preferences, and the emergence of new modes like transportation network companies (i.e. Uber and Lyft), bike share and the KC Streetcar. The survey will include 4,000 households throughout the metro area and is anticipated to last approximately 10 months, and will be completed by mid-2019. Extensive marketing and outreach will be conducted with the participants of the survey, using state-of-the-art technologies.

The outcome of this effort will inform future household travel data collection by MARC and ensure these efforts are accurate, cost-effective and responsive to rapidly-changing transportation behavior. In addition to updating regional travel behavior information, this project will include the development of a methodology for comparing household survey data with results produced by the Sidewalk Labs Replica model (and similar products using mobile device data).

In support of this project, the Kansas Department of Transportation will provide \$250,000 (\$200k federal SPR, \$50k state match). MARC will need to execute an agreement with KDOT to receive these funds. The remainder of the funds (\$550,000) will come from Consolidated Planning Grant.

Regarding the consultant procurement, MARC issued a request for proposals (RFP) and received proposals from four teams. A selection committee with representatives from MARC, MoDOT and KDOT interviewed all four teams, and made a selection based on the following qualifications-based criteria: technical competency, project understanding and approach, management, and

references from previous experience. The four teams, ranked in descending order of score, were led by: (1) Westat, (2) ETC, (3) RSG, and (4) NORC.

Motion: Commissioner Roberts moved to approve the following motions:

- A. Authorize the executive director to execute an agreement with KDOT to receive \$250,000;
- B. Authorize the executive director to execute an agreement for an amount not to exceed \$800,000 with Westat to complete a Regional Household Travel Survey project, pending successful contract negotiation. *(If an acceptable contract cannot be negotiated with Westat, MARC will approach and negotiate with the firm receiving the next highest score.)*

Commissioner Johnson seconded and the motion carried.

#### REVIEW RECOMMENDATIONS OF THE ALLOCATION OF FEDERAL TRANSPORTATION FUNDS

One of MARC's fundamental roles as Metropolitan Planning Organization is to provide a forum and facilitate processes for cooperative decision-making about the use of federal transportation dollars for projects and programs in the Kansas City area.

Ron Achelpohl, Director of Transportation & Environment, reported that on January 19, 2018, MARC issued a call for projects for federal Congestion Mitigation/Air Quality (CMAQ), Surface Transportation Program Block Grant (STP) and Surface Transportation Block Grant Program - Set Aside (TAP) funding programs estimated to total \$55 million in FY 2021 and 2022. MARC received 100 applications for projects by the March 23, 2018 application deadline. The applications received are available for review at [http://www.marc2.org/tr\\_cfp/browseprojects.aspx](http://www.marc2.org/tr_cfp/browseprojects.aspx). MARC will collect a 0.5% project fee for all federal funds awarded through this call for projects.

Throughout the spring and summer of 2018, meetings of the Active Transportation Programming Committee, Air Quality Forum, Kansas and Missouri STP Priorities Committees and the Regional Transit Coordinating Council have been held to develop funding recommendations for these programs. Additional input for the programming process was provided by the Bicycle/Pedestrian Advisory Committee, Destination SAFE Leadership Team, Goods Movement Committee, Highway Committee, Regional Transit Coordinating Council, and the Sustainable Places Policy Committee.

These recommendations were previewed with the Total Transportation Policy Committee (TTPC) on August 21, 2018, and comments on two projects were offered by committee members. The recommendations were included in the meeting packet. All comments from TTPC and the Board will be discussed with relevant MARC programming committees for their consideration before final recommendations will be presented for action by the Board in October as a *Transportation Improvement Program* amendment.

DISCUSSION: Councilmember Suter asked about the scoring process that was considered by the committees when making their recommendations. Mr. Achelpohl said the overall score of each project is important, but is only a part of the recommendation. Other factors include the presentation on the details of the project, high priorities from each of the planning committees, public comments received, historic programming information and the minimum amount that would be accepted by the project sponsor and still have it be a viable project. Councilmember Suter said there was still time for Board members to comment on the recommendations before approval is given in October.

## REVIEW RECOMMENDATIONS TO SET A DIRECTION FOR EMERGING TRANSPORTATION TECHNOLOGIES

Amanda Graor, Principal Planner, said that in 2017, MARC convened a wide-ranging group of stakeholders to begin drafting a policy framework to help the region respond to and prepare for autonomous and connected vehicles, and other emerging transportation technologies in regional planning work. The Autonomous Vehicle (AV) Task Force met three times between September 2017 and June 2018, and working groups were formed around seven main policy areas:

- Travel Demand Management and System Performance
- Infrastructure, Planning and Investment
- Land Use and Environment
- Data Management
- Equitable Access and Mobility Services
- Workforce and Economic Opportunity
- Certification, Liability and Insurance

In addition to the AV Task Force and related working groups, staff engaged many regional committees that work on transportation, environment, aging and other issues in the discussions, in addition to stakeholders and agencies outside MARC's committee structure.

The working groups put forward recommendations that AV Task Force members considered and refined at their June meeting. While there are specific recommendations for the region to consider in each policy area, the overarching themes in the recommendations include:

- **Ongoing need for regional stakeholder education**
  - *Workforce, general public, elected bodies, etc.*
- **Land use policies - parking, curbs-sharing (pick-up/drop-offs)**
  - *Emphasis on state of good repair for all users*
- **Pricing strategies - operational, parking, registration, vehicle use**
  - *Opportunities for shared revenue or ROI, address lost revenue sources*
- **Regional and multi-jurisdictional data sharing**
  - *Robust, effective data sharing agreements and management*
- **Equitable access to services and the transportation system**
  - *Overall increased mobility for all users*

The final recommendations were included in the packet, and will be published in a white paper later this year. The policy framework will continue to be refined and implemented as regional planning work in these and other emerging transportation technology areas moves forward. The Board will be asked to take action on these items at the September meeting.

## 2018 QUALITY OF LIFE SURVEY IN THE KANSAS CITY AREA

Frank Lenk, Director of Research Services, reported that in January 2018, the Ewing Marion Kauffman Foundation commissioned a survey of approximately 1,000 Kansas City area residents to assess their quality of life. The survey was similar in content to the 2017 survey, though not identical. Both were funded to better monitor quality of life issues of concern to the Foundation. For survey purposes, the Kansas City area was defined as Cass, Clay, Jackson and Platte counties in Missouri, and Johnson and Wyandotte counties in Kansas.

To help area residents, businesses, elected officials and other decision-makers benefit from the survey content, the Foundation contracted with the Mid-America Regional Council to bring this



data to the community in a more accessible format. Last year, this resulted in an attractive 60-page report. This year, MARC decided to expand the reach of the information still further by producing a new, interactive website, [www.kcqualityoflife.org](http://www.kcqualityoflife.org). Making its data more interactive and accessible over the Internet is one goal of MARC's long-term strategy to increase its technical capacity.

MARC's Research Services department worked over the summer to analyze the survey results and develop the interactive graphics. Mr. Lenk demonstrated the ease of navigating the survey and the information available on the website. Overall, the 2018 Quality of Life survey showed that nearly 80 percent of residents in the Kansas City area rate their quality of life good or excellent.

#### AUTHORIZE AGREEMENT WITH DOUGLAS COUNTY TO JOIN THE REGIONAL 911 SYSTEM

Adam Geffert, Planning and Administrative Manager, reported that in June, the Public Safety Communications Board (PSCB) approved a new policy for new agencies desiring to join the regional 911 system. The PSCB also approved a request from Douglas County, Kansas, to join the regional 911 system. Information about the new agency policy was also presented to the MARC Board at its June meeting. The new policy outlined the following criteria to guide decisions by the PSCB.

- Location of the Agency or community is contiguous to the counties participating in the Regional 911 System, or there is a relationship between the agency or community's service area and the Regional 911 System's existing service area.
- The local officials in the community making the request to join the Regional 911 System have the support of the governing body of their county and participating cities.
- The cost to provide the Regional 911 System services to the requesting agency or community will be covered by that agency or community and not pose a financial burden on Kansas City metro area counties to allow for services to be delivered.
- The delivery of the Regional 911 System services to the requesting agency or community will not detract from the level of service needed by Kansas City metro area PSAPs.

The Douglas County Sheriff's Office made the request for the county to become a part of the regional 911 system. This request would add both the Sheriff's Office public safety answering point (PSAP) and the University of Kansas Police Department PSAP to the system. The request is consistent with the new policy's criteria. Douglas County is contiguous to the region; the Douglas County Commission approved this action in May 2018; Douglas County will cover all costs associated with their joining and participation in the regional system; and the service to Douglas County's two PSAPs will not detract from the level of service to other PSAPs in the region. Both Douglas County agencies are currently using the same equipment and software as PSAPs in the MARC region. The agreement between the county and MARC is for one year, and may be renewed annually.

Initial costs to connect to the system will be paid by Douglas County. Once added to the system, the county's population will equal 5.48% of the overall regional total, or approximately \$360,000. Costs for the regional 911 system are shared by participating counties on a per capita basis.

**MOTION:** Councilmember Vogt moved to authorize the executive director to execute an agreement with Douglas County to join the regional 911 system. It was seconded by Commissioner Shaffer and carried.

## BRIEF REPORT: REGIONAL EARLY LEARNING EXPANSION EFFORTS

Jovanna Rohs, Director of Early Learning and Head Start, gave an update on early learning initiatives in Missouri and Kansas.

### **KANSAS CITY, MISSOURI:**

In June 2018, Board members heard a brief report indicating that MARC had been approached about our willingness to play a key role in administering and implementing a potential Kansas City, Missouri, early learning program. While MARC was not expected to take a position on the ballot initiative, we were asked to indicate our willingness to consider administering the program, if voters approve the ballot issue and if the KCMO City Council subsequently confirms MARC's role.

Since our last meeting, two events have transpired. The first is the release of a Pre-K for KC plan that revises the proposed governance structure, and the second is the postponement of the ballot question on pre-K funding from November 2018 to April 2019. The governance plan now suggests creation of a separate non-profit 501(c)3. The ballot issue was postponed to allow additional time for additional community stakeholders and school districts to discuss issues and make suggestions to strengthen the plan. MARC will continue to support work to strengthen and clarify the administration and implementation components of the plan, as we have for other regional and community initiatives; however, with these changes, no action is needed from the MARC Board at this time. As Pre-K for KC planning continues, we will apprise the Board of any potential for MARC to have a more formal role in the plan.

### **WYANDOTTE COUNTY, KANSAS:**

The Family Conservancy, a nonprofit serving at-risk children and families throughout the Kansas City metro has launched Start Young. Start Young is a public-private collaborative designed to improve child care in Wyandotte County, increasing access to high-quality, full-day, full-year child care for working families.

The "Start Young" 3-year pilot program is expected to impact 1,200 children in the first year. Funding for this project is provided by Kansas Children's Cabinet and Trust Fund through Communities Aligned in Early Development and Education (CAEDE), and matched 1:1 with funds from the private sector, including investments from: Buffett Early Childhood Fund, Wyandotte Health Foundation, Stanley H. Durwood Foundation, Olathe Wesleyan Church, Hall Family Foundation, and other pending and secured funders. Community partners who will deliver the project include the Mid-America Regional Council, United Way of Wyandotte County, Juniper Gardens Children's Project, and Child Care Aware of Kansas. In addition, sixteen Wyandotte County-based child care providers have been identified to participate in the project. MARC's role in the pilot is to implement the Early Learning Program Profile, a measure of program quality, in the participating programs.

Mrs. Rohs noted that MARC's Early Learning Department has been asked by the Local Investment Commission (LINC) to administer and provide oversight for the Educare program. The state funded program provides resources, technical assistance and training opportunities to childcare providers with an emphasis on licensed exempt, registered and family home providers in Cass, Clay, Jackson, Platte and Ray counties in Missouri. The purpose is to promote school readiness.

She also reported that MARC's Head Start and Early Head Start Program was awarded a grant for \$125 million over the next five years (2018-2023) to support continued services to low-income families and children in Clay, Jackson and Platte counties.



APPROVE CONSENT AGENDA

Councilmember Suter asked for a motion to approve the consent agenda. Mayor Ross moved for approval and Commissioner Holland seconded. The motion passed.

- a. Approve minutes of the June 26, 2018 Board meeting
- b. Approve actions taken at the Head Start Advisory Committee meeting
- c. Approve contractual agreements for on-site support services for Head Start and Early Head Start classrooms
- d. Approve the extension of contractual agreements with The Family Conservancy to provide a centralized intake system and professional development services
- e. Authorize submission of a grant application to the Ewing Marion Kauffman Foundation for Early Learning Quality Improvement Program
- f. Approve contract with the Local Investment Commission to advance the Educare Child Care Enhancement Program
- g. Approve contract with GuardianTrac Independence, LLC (GTI) as the Financial Management Services firm for the Veterans Directed Care (VDC) program
- h. Approve the 2018 Transportation *Unified Planning Work Program Amendment #3*
- i. Approve the 2018 Special Amendment #2 to the *2018-22 Transportation Improvement Program*
- j. Authorize acceptance of funding from Federal Highway Administration (FHWA) for a Multimodal Network Connectivity Measures Project
- k. Authorization to solicit and accept funds from the States of Missouri and Kansas for MARC's air quality program
- l. Authorize the submission of a proposal to the MARC Solid Waste Management District
- m. Authorize agreements with part-time college navigators for the KC Degrees program
- n. Authorize application to the Health Care Foundation of Greater Kansas City to support organizations enrolling residents in the federal health insurance marketplace
- o. Accept grant from Missouri State Emergency Management Agency to support Hazard Mitigation Plan update
- p. Approve expenditures for Emergency Services/Homeland Security program

Commissioner Roberts moved to approve the following motion. It was seconded by Councilmember Vogt and carried.

AUTHORIZE ADMINISTRATIVE ACTIONS INCLUDED IN MEMORANDUM SENT TO THE BOARD OF DIRECTORS ON JULY 26, 2018

- a. Approve a contract with Erika Saleski for the Administration for Community Living grant to implement an integrated care network for older adults
- b. Approve independent contract renewals for Aging Assessor positions
- c. Amend the SFY 2018 contract with Integrity Home Care for homemaker/personal care services
- d. Approve the 2018 3<sup>rd</sup> Quarter Amendment to the *2018-22 Transportation Improvement Program*
- e. Amend contract to accept additional funds from Heartland Conservation Alliance for the Middle Blue River Conservation initiative
- f. Authorize applications to the U.S. Department of Housing and Urban Development (HUD) for Homelessness Management Information System
- g. Amend agreement with CGA Consulting (Caitlin Allen) for Community Health Worker training

EXECUTIVE DIRECTOR'S REPORT

Mr. Warm noted the following items;

On Tuesday, Sept. 11, 2018, the Greater Kansas City Chamber of Commerce is hosting Chuck Marohn, founder of the Minnesota-based nonprofit Strong Towns, for a luncheon/meeting at the Intercontinental Hotel from 11:30-1:30 on the Future of America's Cities. In addition, there will be a reception and program at the Plaza Library at 6:00 pm that evening on the healthy growth of Kansas City. Further details were provided in a handout, and Board members were encouraged to attend.

On Wednesday, Sept. 12, 2018, the Incremental Development Alliance is presenting Monte Anderson, one of the nation's most influential urbanists, who will be sharing highlights of small scale and neighborhood development. The luncheon begins at 12:30 and is sponsored by Gould Evans. Members of the Board and/or their professional staff members were encouraged to participate.

The next meeting of the MARC Board of Directors is Tuesday, September 25, 2018 at noon.

OTHER BUSINESS

No other business was brought before the Board.

ADJOURNMENT

The meeting was adjourned at 1:28 p.m.

MEETING SUMMARY APPROVED:

\_\_\_\_\_  
Carol J. Suter, Chair

\_\_\_\_\_  
Date



## BUDGET AND PERSONNEL COMMITTEE

MID-AMERICA REGIONAL COUNCIL  
600 Broadway, Suite 200  
Kansas City, Missouri 64105

August 28, 2018  
11:00 a.m.  
Minutes of Meeting

### COMMITTEE MEMBERS PRESENT

Commissioner Harold Johnson Jr., Unified Government of Wyandotte County/KCK - MARC Board Treasurer  
Councilmember Carol Suter, Gladstone, Mo. - MARC Board Chair  
Commissioner Rob Roberts, Miami County, Kan. - MARC Board 1<sup>st</sup> Vice Chair  
Commissioner Jimmy Odom, Cass County, Mo. - MARC Board 2<sup>nd</sup> Vice Chair  
Mayor Carson Ross, Blue Springs, Mo. - MARC Board Secretary  
Councilmember Curt Skoog, Overland Park, Kan. - MARC Board Immediate Past Chair  
Councilmember Marge Vogt, Olathe, Kan. - MARC Board Past Chair  
Commissioner Ron Shaffer, Johnson County, Kan. - MARC Board Past Chair  
Commissioner Jerry Nolte, Clay County, Mo.  
Commissioner Dagmar Wood, Platte County, Mo.  
Mayor Eileen Weir, Independence, Mo.  
Councilmember Scott Wagner, Kansas City, Mo.  
Commission Chairman Ed Eilert, Johnson County, Kan.  
Commissioner Doug Smith, Leavenworth County, Kan.  
Commissioner Bob Holland, Leavenworth County, Kan.

### STAFF PRESENT

David Warm, Executive Director  
Ron Achelpohl, Director of Transportation and Environment  
Carol Gonzales, Director of Finance and Administration  
Marlene Nagel, Director of Community Development  
Jovanna Rohs, Director of Early Learning  
James Stowe, Director of Aging and Adult Services  
Barbara Hensley, Public Affairs Program Director  
Becky Hall, Accounting Manager  
Mary Laird, Executive Assistant

### OTHERS PRESENT

None.

### CALL TO ORDER

Commissioner Harold Johnson called the meeting to order at 11:24 a.m. Self-introductions were made.

### DISCUSS AND REVIEW QUARTERLY FINANCIAL STATEMENTS

Staff provides Quarterly Financial Statements to the Budget & Personnel Committee in order to ensure that members can fulfill their fiscal responsibility as appointed Board members. The Board's financial review is critical to the financial health and viability of the MARC organization.

Finance staff is continuing to work on updating the Quarterly Financial Statements in order to help Board members best accomplish their financial responsibilities. Currently, Finance staff is leading a structural change to the MARC Budget, and plans to incorporate formats and data from that work into the quarterly reports over the next year. Staff continues to welcome input on types of information and formats of reports that Board members would find helpful.

Becky Hall reviewed the financial statements as of July 31, 2018, which were included in the meeting packet, and highlighted information in the accompanying schedules.

**DISCUSSION:** Commissioner Johnson commented that he appreciated the new memorandum included in the financial statements, which gave a brief summary of activity in each fund. He also inquired about the surplus or deficit in the monthly indirect cost and fringe benefits allocations. Mr. Warm responded that the indirect costs are difficult to administer because the rates negotiated each year are revised to take effect the following year, which causes the lag in surpluses and deficiencies. The key is to monitor these rates throughout the year.

Jovanna Rohs said that items 2-a and 2-b could be taken in a single vote.

**APPROVE CONTRACTUAL AGREEMENTS FOR ON-SITE SUPPORT SERVICES FOR HEAD START AND EARLY HEAD START CLASSROOMS**

Mid-America Head Start has been awarded a five-year Head Start and Early Head Start grant from the Administration for Children and Families, which begins August 1, 2018. The first year of this five-year grant is broken out into two award periods. The first is a three-month period from August 1, 2018 through October 31, 2018, and the second is a 12-month period from November 1, 2018 through October 31, 2019. As part of its new grant structure, MAHS is supporting Head Start and Early Head Start programs through contracts with individuals and agencies who will provide a variety of support services for fourteen Tier 1 and Tier 2 programs serving a total of 825 children. Each contractor or agency was selected through an individual Request for Qualifications process conducted from April-June of 2018.

Contracted services include education coaching services for Head Start and Early Head Start classrooms, nutrition consultation services to support individual children's needs, mental health services for classrooms and therapeutic services for children and families, health consultants and community health workers to support individual families with special health care challenges, early intervention services for children with special needs and diagnosed disabilities, and an on-site monitor to ensure environmental safety.

A chart indicating the name/agency, the type of service to be provided, the hourly rate of service, the total hours for the total 15-month period, and the total dollar amount not to be exceeded for each contract was included in the packet. The total not to exceed amount of these 15-month contracts is \$675,675. These contracts are included in Mid-America Head Start's Fiscal Year 2018 - 2019 budgets.

**RECOMMENDATION:**

Approve 15 individual contracts for on-site support services at 14 Mid-America Head Start programs, as outlined in the attachment, from August 1, 2018 through October 31, 2019 for a total amount not to exceed \$675,675.

**APPROVE THE EXTENSION OF CONTRACTUAL AGREEMENTS WITH THE FAMILY CONSERVANCY TO PROVIDE A CENTRALIZED INTAKE SYSTEM AND PROFESSIONAL DEVELOPMENT SERVICES**

In January of 2018 the MARC Board approved Mid-America Head Start's (MAHS) contract with The Family Conservancy (TFC) to implement phase one of a Central Intake System for all of the MAHS programs. This contract ended when the previous Head Start grant ended on July 31<sup>st</sup>, 2018. With the award of a new five-year Head Start grant which began August 1, 2018, MAHS is requesting to



extend the term of its contract with TFC to implement the second phase of the Central Intake System through December 2018. Total cost not to exceed \$225,000.

In July of 2018, MAHS expanded the scope of its contract with TFC to include a contract for Professional Development Services. TFC has been providing technical assistance and staff support in developing and facilitating training for Head Start and Early Head Start teachers, family advocates and directors. This work also ended when the previous Head Start grant ended on July 31<sup>st</sup>, 2018, and MAHS is requesting to extend the term of its contract with TFC to provide professional development services through December 31, 2018. Total cost not to exceed \$125,000.

Thereafter, MAHS may extend the terms of these contracts contingent upon successful performance and services provided, and upon availability of funds. These contracts are included in Mid-America Head Start’s Fiscal Year 2018-2019 budgets.

**RECOMMENDATION:**

Approve extension of MARC’s contractual agreements with The Family Conservancy for a centralized system of intake for Head Start programs and professional development services from August 1, 2018 through December 31, 2018. Total costs not to exceed \$350,000.

MOTION: Councilmember Skoog moved to approve the recommendations in items 2-a and 2-b above. It was seconded by Commissioner Shaffer and carried.

**AUTHORIZE SUBMISSION OF A GRANT APPLICATION TO THE EWING MARION KAUFFMAN FOUNDATION FOR EARLY LEARNING QUALITY IMPROVEMENT PROGRAM**

Mrs. Rohs advised that MARC’s Metropolitan Council on Early Learning (MCEL) wishes to submit a grant application to the Ewing Marion Kauffman Foundation to support efforts to 1) pilot a new kindergarten readiness assessment instrument in area preschool classrooms, 2) develop a Family Child Care version of the Early Learning Program Profile, and 3) to enhance the collection of data sets on children, families and early learning programs to support the development of regional and school district early learning data mapping and reports.

Funding for these projects will support broader systems work currently underway and provide a greater context for 1) understanding of the school readiness factors exhibited by area preschool children; 2) measuring; supporting; and enhancing the quality of child care providers; and 3) understanding the availability of early learning services as well as equity and access issues affecting children and families in the nine county Greater Kansas City Metropolitan area.

Funding from this grant was not included in the 2018 budget.

REVENUES	
Amount	\$110,000
Source	Kauffman Foundation
PROJECTED EXPENSES	
Personnel (salaries, fringe, rent)	\$30,000
Contractual	\$75,000
Pass-Through	\$ 0
Other (supplies, printing, etc.)	\$5,000

MOTION: Commissioner Odom moved to authorize MARC to submit a \$110,000 grant to Ewing Marion Kauffman Foundation for one year of early learning program support, and authorize the executive director to accept funds and execute agreements with contractors if awarded. It was seconded by Mayor Weir and carried.

APPROVE CONTRACT WITH THE LOCAL INVESTMENT COMMISSION TO ADVANCE THE EDUCARE CHILD CARE ENHANCEMENT PROGRAM

MARC's MCEL provides leadership to the development and implementation of a community-driven, outcomes-based plan for a comprehensive early learning system.

LINC wishes to contract with MCEL to administer and provide oversight for the Educare Program. Educare is a twenty-year old state funded initiative that provides resources, technical assistance and training opportunities to child care providers with an emphasis on licensed exempt, registered and family home providers in Cass, Clay, Jackson, Platte and Ray counties in Missouri. The purpose of the project is to promote school readiness by establishing linkages in policy, program and practice that will ensure all children receive a solid foundation for success in school and life. Services and supports offered to area child care providers include:

- Professional development opportunities for child care providers
- Individualized home visits for family child care providers
- Customized center-based training
- Supporting coordination of existing community resources to optimize funding
- Linking child care providers and families to schools and community resources
- Increasing consumer awareness of the important role quality child care has in the development of children

This project complements the current mission and work of MARC's Early Learning Department. The majority of the funding from this agreement will be passed through to direct service agencies. A portion of the funds will be used to support existing MCEL staff time in the management and oversight of the project subcontracts and to support data entry and coordination of program supports. Funding from this contract was not included in the 2018 budget.

REVENUES	
Amount	\$400,000
Source	Missouri Department of Social Services
PROJECTED EXPENSES	
Personnel (salaries, fringe, rent)	\$80,000
Contractual	\$318,000
Pass-Through	\$ 0
Other (supplies, printing, etc.)	\$2,000

MOTION: Councilmember Vogt moved to approve contract with the Local Investment Commission to advance the Educare Child Care Enhancement Program in an amount not to exceed \$400,000 for a ten-month contract and authorize the executive director to accept funds and execute agreements with contractors. It was seconded by Commissioner Shaffer and carried.

APPROVE CONTRACT WITH GUARDIANTRAC INDEPENDENCE, LLC (GTI) AS THE FINANCIAL MANAGEMENT SERVICES FIRM FOR THE VETERANS DIRECTED CARE (VDC) PROGRAM

James Stowe reported that in January 2018, the Board approved the establishment of a contract with the Department of Veterans Affairs for MARC Aging and Adult Services to manage the Veterans Directed Home and Community-Based Services (now, Veteran Directed Care; VDC) program. The VDC program provides a system where veterans referred by the VA Medical Center can choose a care provider that will assist them in ways that will allow them to stay in their home. MARC's role is to provide assessment, care plan development and management of the relationship between the chosen provider and the veteran. Under a federally approved readiness assessment for the Missouri Alliance of Area Agencies on Aging (MA4), GuardianTrac Independence, LLC. was approved to provide financial management services (FMS) for the Veterans Directed Care program. FMS services help the

veteran track and approve expenditures, and with all components of being the employer for their desired caregiver

Under the VDC program, MARC is reimbursed approximately \$515 per veteran each month for coordinating and managing the VDC program. An elevated reimbursement of \$700 is made for the first assessment of the veteran. The fee schedule for FMS services is an initial fee of \$170 per client, with an ongoing monthly fee of \$85. For each client, the annual cost is \$1,105, and the maximum projected fees paid to GTI for SFY 19 are \$110,500 at full client enrollment (est., 100 veterans). At a more realistic client population, the expected annual fees are \$26,520.

GuardianTrac Independence will be under contract with MARC and we will pay them for their charges for FMS services from the fees we receive from the Department of Veterans Affairs. Initially, as the program ramps up, the coordination work will be handled with existing MARC staff. At full client enrollment, an additional staff position and oversight will be required to appropriately manage the caseload. Following is a conceptual budget using the payment amounts that are known, and using the full client population of 100 as a base for calculation. This is a new program to MARC, so specific projections are difficult to make without additional experience in our region.

Annual Estimates: Based on 100 clients			
Service/Program	Program Funding	Expenses	Pass-Through
Initial Encounter	\$70,000		
Ongoing Management (11 months)	\$605,000		
Payments to Caregiver and other service providers			\$2,400,000
Payments to GTI		\$110,500	
MARC Coordination Costs		\$294,604	

At its August 8, 2018 meeting, the MARC Commission on Aging recommended that the MARC Board authorize the executive director to contract with GuardianTrac Independence, LLC. (GTI) as the Financial Management Services firm for Veterans Directed Care.

MOTION: Commissioner Shaffer moved to approve a contract with GuardianTrac Independence, LLC (GTI) as the Financial Management Services firm for Veterans Directed Care. It was seconded by Mayor Weir and carried.

APPROVE CONTRACT WITH WESTAT TO CONDUCT A REGIONAL HOUSEHOLD TRAVEL SURVEY

Ron Achelpohl reported that MARC periodically conducts regional household travel surveys to obtain detailed information about the socio-economic characteristics and travel behavior of persons living in the Greater Kansas City region. The information collected is used as the foundation for developing travel demand forecasts, a key requirement of federal metropolitan transportation planning regulations. The last regional household travel survey was completed in 2004, and since that time the region has experienced significant shifts in travel behavior due to changing demographics, generational preferences, and the emergence of new modes like transportation network companies (i.e. Uber and Lyft), bike share and the KC Streetcar.

The outcome of this effort will inform future household travel data collection by MARC and ensure these efforts are accurate, cost-effective and responsive to rapidly-changing transportation behavior. In addition to updating regional travel behavior information, this project will include the development of a methodology for comparing household survey data with results produced by the Sidewalk Labs Replica model (and similar products using mobile device data). The project is anticipated to last approximately 12 months, and will be completed by mid-2019.



In support of this project, the Kansas Department of Transportation will provide \$250,000 (\$200k federal SPR, \$50k state match). MARC will need to execute an agreement with KDOT to receive these funds. The remainder of the funds (\$550,000) will come from Consolidated Planning Grant.

With regards to consultant procurement, MARC issued a request for proposals (RFP) and received proposals from 4 teams. A selection committee with representatives from MARC, MoDOT and KDOT interviewed all 4 teams, and made a selection based on the following qualifications-based criteria: technical competency, project understanding and approach, management, and references from previous experience. The four teams, ranked in descending order of score, were led by: (1) Westat, (2) ETC, (3) RSG, and (4) NORC.

This project is included in the 2018 MARC Budget and *Unified Planning Work Program*, and will be incorporated into the 2019 budget and program.

REVENUES (Total = \$800,000)	
Amount	\$200,000/\$50,000/\$550,000
Source	Federal (SPR), State (KS), Federal (CPG)
PROJECTED EXPENSES	
Personnel (salaries, fringe, rent)	
Contractual	\$800,000
Pass-Through	
Other (supplies, printing, etc.)	

DISCUSSION: Commissioner Johnson asked if there was any problem in negotiating the contract with Westat. Mr. Achelpohl said that the initial contract submittal by Westat did not meet MARC's Disadvantaged Business Enterprise goal of 20 percent. However, the latest discussions with Westat are very likely to achieve the goal before the contract is executed.

MOTION: Mayor Pro Tem Wagner moved to approve the following recommendations. It was seconded by Commissioner Wood and carried.

- A. Authorize the executive director to execute an agreement with KDOT to receive \$250,000;
- B. Authorize the executive director to execute an agreement for an amount not to exceed \$800,000 with Westat to complete a Regional Household Travel Survey project, pending successful contract negotiation. *(If an acceptable contract cannot be negotiated with Westat, MARC will approach and negotiate with the firm receiving the next highest score.)*

**AUTHORIZE ACCEPTANCE OF FUNDING FROM FEDERAL HIGHWAY ADMINISTRATION (FHWA) FOR A MULTIMODAL NETWORK CONNECTIVITY MEASURES PROJECT**

Mr. Achelpohl said that the FHWA Office of Human Environment released a call for proposals on July 5, 2018 with the intent of providing assistance to State (DOTs) and MPOs in operationalizing multimodal network connectivity measures into a performance-based planning and a project development approach. The national call for proposals required all applications submitted by August 2, 2018. On August 15, 2018, we received notice from the Office of Human Environment that MARC's proposed Scope of Work was approved. MARC will receive \$55,814.40 that will be matched with \$13,953.60 (in-kind).

MARC's Multimodal Network Connectivity Measures Project will evaluate the performance of bicycle and pedestrian networks near mobility hubs. Measures will be used assess future investment scenarios and transportation packages, including a no build scenario and various levels of multimodal investment scenarios. MARC will use the results of this work during the development of the Regional Transportation Plan (RTP 2050), while supporting further work to implement SmartMoves 3.0 and the Regional Transportation Bikeway Plan.



This funding will support work by MARC staff to collect data and perform activities detailed in this scope of work. We do not anticipate soliciting outside consultant support for this project.

Multimodal Network Connectivity Measures Project

FHWA funding (80%)	\$55,814.40
Local In-kind Match (20%)	\$13,953.60
TOTAL	\$69,768.00

MOTION: Councilmember Skoog moved to authorize the executive director to execute a funding agreement with MoDOT to accept FHWA funding in an amount up to \$55,814.40, with a local in-kind match of \$13,953.60, for the purposes of conducting a “multi-modal network connectivity measures” project. It was seconded by Councilmember Suter and carried.

Marlene Nagel said that items 2-h and 2-i could be taken in a single vote.

AUTHORIZE AGREEMENTS WITH PART-TIME COLLEGE NAVIGATORS FOR THE KC DEGREES PROGRAM

Marlene Nagel reported that the Mid-America Regional Council launched a post-secondary completion program in September 2016 - KC Degrees. KC Degrees is designed to increase the number of adults who return to school and complete a postsecondary degree. The initiative is a partnership between MARC, several 2-year and 4-year postsecondary institutions, and an array of workforce partners committed to supporting adult learners in the community. In its first year of implementation, KC Degrees began to recruit and support adults interested in the program; offered advising through community advisors to help the adults identify the degree program and institution best suited to meet their needs; and identified and secured resources to help adults remove barriers to participation.

KC Scholars has agreed to support the KC Degrees program for the time period 8/1/18 - 6/30/19. MARC has part-time contractors to support the program by working directly with adults expressing interest in the program, helping them to assess their career and education goals, select an educational program that might best meet their needs, and accomplishing a warm handoff to the educational institution to help support their enrollment in and through their college experience. The individuals and their contract terms are as follows:

- Cathleen Peterson, Peterson Educational Services LLC, who began support for the program in its first year, will work up to 20 hours/week for a total of \$25,480.
- Carrie Barnes began work in year 2, and will work up to 20 hours/week for a total of \$23,520.
- Ebony Hodges began work in year 2, and will work up to 20 hours/week for a total of \$23,520.
- Tamika Doolin began work in year 2, and will work up to 20 hours/week for a total of \$23,520.

**RECOMMENDATION:**

Authorize agreements with the KC Degrees Program college advisors as part-time KC Degrees Advisors as described above.

AUTHORIZE APPLICATION TO THE HEALTH CARE FOUNDATION OF GREATER KANSAS CITY TO SUPPORT ORGANIZATIONS ENROLLING RESIDENTS IN THE FEDERAL HEALTH INSURANCE MARKETPLACE

MARC has convened community stakeholders to increase access to health care for uninsured and underinsured residents through the Regional Health Care Initiative since 2006. In 2013, MARC convened community organizations to coordinate efforts to raise awareness among area residents about the federal health insurance marketplace and to help area residents enroll for health insurance.

Representatives from area agencies have met regularly since that time to coordinate their work and share information. MARC received funds from the REACH Healthcare Foundation and the Health Care Foundation of Greater Kansas City to support the work. MARC partnered with the United Way of Greater Kansas City to promote the use of 2-1-1 as a central phone number for residents interested in getting information or counseling assistance to be directed to the appropriate community agency.

MARC utilized foundation funds for staff support, to purchase media to promote awareness about the health insurance marketplace, costs associated with special events, training for counselors, website support and other services. The Health Care Foundation has expressed interest in continuing to support MARC's coordination services for the next enrollment period. The cost to provide those services and to continue to partner with United Way of Greater Kansas City for the 12 months beginning October 1, 2018 is \$85,000. United Way's 2-1-1 service will continue to provide services, referring callers to agencies with trained personnel to answer questions and help them enroll. The media budget will allow for continued promotion in October, November and mid-December. MARC salary, fringe, and overhead total \$26,250 from the grant. The federal government has reduced support for education about the marketplace and questions due to changes in coverage require additional outreach.

**RECOMMENDATION:**

Authorize the executive director to submit an application and if awarded, accept funds to support the community's education and outreach efforts around the federal health insurance marketplace for up to \$85,000 from the Health Care Foundation of Greater Kansas City, and to subcontract with United Way of Greater Kansas City for \$20,780 for 2-1-1 services. MARC will utilize \$62,720 of the budget for paid media to promote enrollment beginning November 1.

Councilmember Skoog moved to approve items 2-h and 2-i as recommended above. It was seconded by Councilmember Suter and carried.

Mrs. Nagel advised that items 2-j and 2-k could be taken in a single vote.



ACCEPT GRANT FROM MISSOURI STATE EMERGENCY MANAGEMENT AGENCY TO SUPPORT HAZARD MITIGATION PLAN UPDATE

She said that MARC's Emergency Services programs help ensure the region's ability to prepare, respond and recover with coordinated plans and high-quality training, technology and equipment. The following grant and expenditures will support planning, training, equipment and exercise activities.

Local governments, school districts and other public organizations are required to develop and adopt a Hazard Mitigation Plan every five years in order to be eligible to apply for certain FEMA funds. MARC has assisted local communities and agencies in the five Missouri counties to prepare a plan every five years over the past 15 years. The Missouri State Emergency Management Agency has offered MARC a grant of \$92,950 to support the preparation of a new plan, which is due to the state by May 1, 2020. The grant requires a local match, which will come from staff time charged into local government resources and in-kind match from the time that local officials spend in the plan's development.

**Budget:**

Personnel (salary, fringe, indirect, rent):	\$83,000
Meeting (for public meetings):	\$2,000
Printing of reports and documents:	\$1,000
Contractors (support plan development):	\$6,950

**RECOMMENDATION:**

Authorize the acceptance of \$92,950 in FY18 FEMA funds through the state of Missouri to support preparation of the 5-county Hazard Mitigation Plan.

APPROVE EXPENDITURES FOR EMERGENCY SERVICES/HOMELAND SECURITY PROGRAM

MARC's Emergency Services programs help ensure the region's ability to prepare, respond and recover with coordinated plans and high-quality training, technology and equipment. The following grant and expenditures will support planning, training, equipment and exercise activities.

1. Contract for LEPC Planning Support: Approve agreement with The Blue Cell, a consultant selected through a Request for Proposals process to assist the Mid-America Local Emergency Planning Committee (LEPC) with surveys and interviews to prepare a hazardous materials' capabilities assessment, update the LEPC plan and support a tabletop exercise for 50 participants. The project is expected to be completed by September 30, and the budget of \$30,000 is from LEPC grant funds.
2. Amendment to agreement for professional services: Authorize an amendment to an existing agreement with John Davis for professional services to assist the emergency services program with regional planning, data analysis and project management, training and exercise support, coordination and meeting, and reporting and other special project tasks with an emphasis on Complex Coordinated Terrorist Attacks (CCTA). Funding provided by Missouri Homeland Security and CCTA grants. Request approval for a contract amendment increase from \$54,259 to \$131,875 and extend John Davis' contract to September 30, 2019.
3. Equipment Purchases: Approve the purchase of warranties and equipment support services (Reachback; hazmat ID, Gas ID, First Defender and Responder RCI) for the region's seven enhanced hazmat teams (Kansas City, Lee's Summit, Central Jackson County, Independence, Kansas City, KS, Overland Park & Leavenworth Fire Departments). Continued support of this equipment will help ensure regional hazardous materials response for rapid identification, containment and mitigation of WMD/Hazmat incidents and maximize the ability to coordinate response activities. Amount not to exceed \$52,750, sole source procurement using FY18 Kansas & Missouri Homeland Security grant funds.

**RECOMMENDATION:**

Authorize the expenditure of Homeland Security and LEPC funds as described above.

MOTION: Commissioner Odom moved to approve items 2-j and 2-k as recommended above. It was seconded by Mayor Pro Tem Wagner and carried.

APPROVAL OF CONSENT AGENDA

Mayor Ross moved to approve the Consent Agenda. It was seconded by Councilmember Suter and carried. The action consisted of the following items:

- a. Approve the minutes of the June 26, 2018 meeting
- b. Authorize MARC to purchase a Ford Transit Van from Olathe Ford for the Operation Green Light (OGL) program
- c. Approve 2018 Transportation *Unified Planning Work Program Amendment #3*
- d. Authorization to solicit and accept funds from the States of Missouri and Kansas for MARC's air quality program
- e. Authorize the submission of a proposal to the MARC Solid Waste Management District

AUTHORIZE ADMINISTRATIVE ACTIONS INCLUDED IN MEMORANDUM SENT TO THE BOARD OF DIRECTORS ON JULY 26, 2018

Mayor Ross moved to authorize the Administrative Actions included in the Memorandum sent to the Board of Directors on July 26, 2018. It was seconded by Councilmember Skoog and carried. The action consisted of the following items:

- a. Approve a new contract from The Family Conservancy to expand the Early Learning Program in Wyandotte County
- b. Approve a contract with Erika Saleski for the Administration for Community Living grant to implement an integrated care network for older adults
- c. Approve independent contract renewals for Aging Assessor positions
- d. Amend the SFY 2018 contract with Integrity Home Care for homemaker/personal care services
- e. Amend contract to accept additional funds from Heartland Conservation Alliance for the Middle Blue River Conservation initiative
- f. Authorize applications to the U.S. Department of Housing and Urban Development (HUD) for Homelessness Management Information System
- g. Amend agreement with CGA Consulting (Caitlin Allen) for Community Health Worker training
- h. Approve the purchase of an additional vehicle for the 9-1-1 program

OTHER BUSINESS

There was no further business discussed at the meeting.

ADJOURNMENT

The meeting was adjourned at 11:52.

MINUTES APPROVED:

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Harold Johnson Jr., Chair

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Date





METROPOLITAN EMERGENCY MANAGERS COMMITTEE  
Mid-America Regional Council  
Thursday, August 9, 2018 at 1:00 p.m.

## Meeting Report

<p><b>Present:</b> Vice- Chair, Kyle Burns, City of Overland Park EM Carol Ayres, The Family Conservancy Andy Bailey, National Weather Service Michael Bellinger, Amateur Radio Emergency Service Gloria Brandenburg, SEMA James Connelly, KCMO EM James Eden, Lee's Summit Fire Department Estelle, Lester, Water One Bruce Fisher, Blue Valley Public Safety Dante Glinecki, Independence EM Carl Harper, Ray County EM Todd Hart, KCRFC</p>	<p>Geoff Hinkle, Independence EM Steve Hoeger, KS Metro Healthcare Coalition Heather Lee, Heart to Heart International Matt May, Wyandotte/KCK Unified Government EM Mike O'Neal, Platte County Sheriff's Office Julie Pedrosa, Red Cross Dan Robeson, Johnson County EM Josh Smith, KDEM Ken Smith, City of Lake Winnebago Zane Steves, GSA Pete Sturner, Platte County Sheriff's Office EM CL Webb, Wyandotte/KCK Unified Government, PH</p> <p>Staff: Erin Lynch, Charity Hunter, Rob Cole, Diana Mendoza-Cauley</p>
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### 1. INTRODUCTIONS & WELCOME

### 2. APPROVAL OF AGENDA AND MEETING REPORT: Motion – Matt May, Second – Lake Winnebago EM. Motion Carried.

### 3. REGIONAL HOSPITAL SHELTER IN PLACE SURVEY RESULTS – Charity Hunter, MARC Emergency Services Planner and Steve Hoeger Kansas Metro HCC Coordinator – Charity described the background for the survey (ASPR requirement to assess shelter in place plans in MARC HCC). About 35 hospital EMDs surveyed, 22 responded so far. Charity will share information with County/City EM's to advance preparedness and build relationships between EMD's and hospitals within their jurisdiction. Will resurvey in a year to determine how hospitals have advanced SNP plans. Key Takeaways:

- *Most have identified EOPs, access control plans, commo plans, and identify who will conduct damage assessment.*
- *16 of 22 do not use signage to indicate shelter locations*
- *12 of 22 answered "Somewhat" to the question regarding specific requirements for shutting down HVAC systems*
- *EOPs include family unification: Majority Yes or somewhat*
- *Resources to support non-patients with access and functional needs – 38% said no, rest said somewhat or yes*
- *EOP include steps to notify local EOC – 30% said no. This appears to be big gap.*
- *Majority of plans include planning for vulnerable populations*
- *Which resource would run out first after 96 hours – majority pharma, then food, then medical supplies, then fuel? Comments indicated this is subjective based on road conditions.*
- *Water loss endurance – 7 said 1 day, 9 said 2-3 days, 4 said 4-5 days, 2 said more than 5 days.*
- *Power loss – majority said they could maintain 2-5 days. Fuel may not power HVAC.*
- *Daily operations with current medical supply inventory – 10 said 4-5 days*
- *Pharma supply – majority said 2-3 days. Carolyn said dependent on type of pharma, if its narcotics it may just be a day.*
- *Food supply – 23% more than five, rest 5 days or under*
- *Challenges noted include supply chain integrity (HCC project to assess this year), preserving patient health records, patient surge, and maintenance of equipment for vulnerable populations*
- *Psychiatric hospitals face unique challenges, plans for acute care don't translate to psych, mental health planning is gap in region*
- *Best practices included fuel monitoring devices, partnerships with LTC facilities, backfill cooling towers using fire departments, 96 hour assessments should be shared with EM, need to know interdependencies among systems*
- *All agreed answers should be shared with EM, Charity will share with EM, 3 -5 responses indicated to varying degrees they did not know or weren't sure how to contact their EM*
- *Erin stated that recovery exercise will be infused with objectives from health and medical community in order to illuminate best practices and to help understand what resources are available to help facilities get up and running again.*
- *Census is near capacity every day in our region, so an evacuation will be a stressor on region.*

#### 4. SUBCOMMITTEE AND TASK FORCE REPORTS –

- a. Citizen Readiness -- Kyle Burns said CERT rodeo on August 4, 83 participants, 10 instructors, 18 classes on 11 topics. Great opportunity for teams to come together, learn from each other, and network.
- b. Communications –Matt May provided update
  - i. MERS 27: responded, four did not.
  - ii. MECC: October 6 8am – 2pm, debrief thereafter at Wyco. Next meeting Saturday at 10am Leavenworth County EOC
- c. Integrated Warning Team – Andy Bailey provided update – Training center reserved for November 1, goal is to bring in MO DOT, KDOT, traffic reporters, and EM to discuss how we can all work together during the upcoming winter weather season.
- d. WebEOC -- Matt May and Mike O’Neal provide update: highlights of 8.5 show case and upcoming training Matt briefed that local copies have connectivity with State of KS, Mike and Matt have meeting with Juvare to discuss regional progress and support tomorrow. Mike stated Training on 27<sup>th</sup> at JOCO in lieu of regular meeting. One session in the morning, one in the afternoon, different content for each session, more general content in PM. Webinar with Q and A period. Focus of training is roadmap, medical capabilities such as eICS, how to use Web EOC, new features, and other capabilities from the conference. Recommended attendance is heavy users, up to 40 people. Both MO and KS reps will be there. Mike also reminded everyone if still on 8.4 or less must upgrade, as the company will not support after 12 months. Announcement is forthcoming.
- e. Membership & Bylaws – (Terry Kegin / Jennifer Fales) – affiliate application COAD – *Membership and Bylaws chairs recommend affiliate membership Vote needed* Kyle Application before us from KC regional COAD for affiliate membership. Motion to add an affiliate member – Mike Oneal Second from Dan, Motion carried. Kyle tasked Dan with informing COAD that they are now affiliate members.
- f. Plans -- Pete Sturner provided update - Group spent a lot of time discussing CCTA, still trying to develop template. Went through feedback from C2TA, need to review FEMA Planning Guidance prior to next meeting. Also discussed a planning guide with a template for inclusion into LEOP. Also discussed the LEPC Plan, looked at updated changes to plan and final review on distribution. Pete shared distribution plan that was adopted by plans.
  - EM, LE, Fire will receive entire plan by HSN
  - EHS RMP access to base plan via website, access to sensitive annexes via read receipt email.
  - Other partners (School districts, hospitals) access to base plan via web site, access to sensitive annexes upon request to EM, should be granted absent a security concern, but should be done in secure area, no photos or copies

Erin stated that HSN is regional hub for planning resources. There were challenges in the past with HSN, however, it has been enhanced in functionality and staff is working internally to determine how we can enhance information on HSN as well as user experience. Erin would like to create HSN user group to enhance value, asked those who are using it to contact her or John Davis. Also, looking to identify a HSN POC for each of the CCTA participating jurisdictions.

- g. MRCKC – Dante Gliniecki stated that there is meeting next week with remaining leadership to develop strategy, still need to execute documents with MARC, but on cusp of starting to move forward with plan. Reminded fellow EM that this is a regional program, asked for input on how to contact LEPH (via EM or direct), will need strong buy in. Long-term strategy will be to incorporate volunteer ESF 8 assistance. Kyle suggested a presentation to this group to enhance understanding of MRCKC capabilities, Dante agreed.
- h. Hazard Mitigation - Mike O’Neal provided update –after co-chairs Mike shared there are three out there but not funded on Missouri side. Application is on SEMA website (75/25 or 70/30, most former). It is helpful to have match prior to submission; however, state sometimes goes to highest risk first. HMGP, Pre-disaster mitigation, and flood mitigation (3 types). Platte County has had a few. Mike suggested KS jurisdictions query KDEM, Kyle said KS side is same thing, goes by priority.

Erin Lynch queried the Committee to confirm support of Missouri jurisdictions for MARC to enter into MOA with SEMA for regional hazard mitigation plan update. Draft due Feb 1, 2020 \$92,950, with \$30,000 match – Dante and Mike endorsed. Kyle asked if this is MO only, Erin said each state has regional plan, KS Kickoff September 17, MO need to be submitted February 2020. We have a master’s level student intern interested in doing research to update plan. Erin, Mike, Cary, and Chris Lauer will meet to discuss scope of work and determine mitigation actions. Will try to implement bi-state strategy to extent possible. Dan stated that the three KS counties are working together and this can be leveraged to identify commonalities with MO Metro. The Committee confirmed support to enter into the MOA and support Missouri jurisdictions with the 2020 Plan. FY 2018 Pre-Disaster Mitigation grant funding opportunity announced.

- i. Badging and Accountability (Matt May/ Geoff Hinkle) Used for CERT rodeo, however, Geoff stated that data was lost due to system issue with Rapid Tag system not being online. This can lead to data loss. Brendan stated that he will attempt to use this to encourage the company to correct this flaw.

## 5. HOMELAND SECURITY/EMERGENCY SERVICES REGIONAL ACTIVITIES

- a. **CCTA - report sent in advance**, Kyle stated that C2TA was a long three days but well worth it. Breakout sessions were useful, turned over to Erin to discuss outcomes.
  - i. C2TA workshop outcomes – opportunity to invite others into thinking on complex problems. Also created a shared understanding of the threat, used a local scenario as basis for working groups. Looked at problems in area with situational awareness, operational coordination, and public information.
    - 1. Initial EMS Hospital Patient tracking, family reunifications meeting: There was an initial joint meeting between primarily hospitals and EMS to discuss status of patient tracking and ways to increase and improve information sharing
    - 2. RHSCC leadership at last meeting asked staff to work on developing a scope of work for advancing mutual aid and resource management planning.
  - ii. PER 335 Critical Decision making in a CCTA: Erin encouraged registration.
- b. **HCC – Rob Cole**
  - i. HCC is beginning review and update of ESF 8
- c. **Trainings Erin**
  - i. DOJ training – Muslim Sikh American building Partnerships
- d. **Exercises – Rob**
  - i. Recovery - additional quotes sought due August 24 with estimated dates of seminar in Nov and TTX in Jan.
  - ii. LEPC TTX – vendor selected, survey pending, TTX week of September 10th
  - iii. AMSC September 26.
  - iv. Hospital Exercise October 23<sup>rd</sup> – need design team representative
- e. **CFATS workshop Aug 16**

## 6. REPORTS

- a. SEMA – Gloria Brandenburg provided update – DMAT looking for nurses and doctors to join team, also looking for facility to share 22-foot trailer.
- b. KDEM – Matt May stated KDEM working to fill regional coordinator position.

## 7. OTHER BUSINESS ANNOUNCEMENTS

- a. MEMC vice Chair Elections in September – MO – nominating committee will bring forward recommendation at Next meeting – discuss options for September meeting. Kyle asked for volunteers for nominating committee. Carl Harper and Matt May will join Erin and the co-chairs. Kyle said that if you would like to be nominated send Erin an email, we want people who want to participate. Date for September meeting will be changed to 9am on September 28.
- b. Erin called attention to the Homeland Security Investments Inventory information in the packet.
- c. Dante stated CDRN is focused on serving children in disaster, continuing to meet, focused on four initiatives including planning, and working with KC and state of MO to synchronize efforts.
- d. Dante stated that Region A continues work on evacuee reception plans; hope to be ready to share by end of 2019.

## 8. NEXT MEETING – September to be determined, propose Sept 28 9am due conflict with KEMA





## 2018 MEETINGS

Mid-America Regional Council  
Hazard Mitigation Planning  
Initial Meeting – November 15, 2018  
Meeting Summary

**Present:**

Sasan Baharaeen, IT Program Director  
Paul Bushore, GIS Data Developer  
John Davis, Special Projects Coordinator  
Jay Heermann, GIS Manager  
Tom Jacobs, Environmental Program Director  
Marlene Nagel, Director of Community Development  
Angela Waltz, Website Coordinator

Marlene provided an overview of the project:

- The Hazard Mitigation Plan will include the five (5) Missouri counties and tie in the three (3) Kansas Counties
- Draft plan should be completed by the end of 2019
- Final plan with all jurisdictional signatures due May 1, 2020
- Grant supporting project is \$92,950 with a \$30,893 match

Marlene stated that in the past we have included mainly emergency management individuals with a few others brought in a then some schools.

This year we would like to focus on incorporating a more active role with jurisdictional planning and public works individuals.

We should plan to have our early kickoff in Jan 2019 and see about getting an outside speaker (i.e. Cedar Rapids)

John stated that the State of Missouri hired an outside contractor to help with the state plan, which is complete. During the process, a lot of material was prepared to help with the updating of jurisdictional mitigation plans. A thumb drive with the materials should be available next week.

Sasan provided an overview of the on-line collection tool that was used last year.

The group also reviewed the last plan that is currently on the MARC website. It was determined that much of the information could be updated at any time. John stated that the thumb drive would have shape files included. Paul and Jay both indicated that there are several other places that data could be gathered from as well.

John will be gathering contact data from those who participated last time. An email will be sent out informing them about the process which will begin again in 2019 and ask for additional contacts from planning and public works.

**Meeting on Regional Hazard Mitigation Plan for  
Cass, Clay, Jackson, Platte and Ray counties**

**Mid-America Regional Council, SEMA and FEMA  
November 28, 2018  
9 am  
MARC offices**

1. Welcome and Introductions
2. Review of Plan requirements/changes since the last plan was adopted in 2015
3. Overview of MARC planning process/timeline
4. Oversight Committee/Community Engagement
5. Scope of plan – natural hazards/man-made hazards
6. Focus on Resiliency
7. Involvement of SEMA/FEMA in plan development
8. Other items

Mid-America Regional Council  
Meeting on Regional Hazard Mitigation Plan for  
Cass, Clay, Jackson, Platte and Ray counties  
November 28, 2018  
9:00am Westview Room  
Meeting Summary

**Present:**

Laurie Bestgen – FEMA, Mitigation Planner  
Heidi Carver – SEMA, MO State Hazard Mitigation Officer  
John Davis – MARC, Special Projects Coordinator  
Teresa Lehman – SEMA, MO Deputy Hazard Mitigation Officer  
Erin Lynch – MARC, Emergency Services and Homeland Security Program Director  
Donna Martin – MARC, Public Health Senior Planner  
Marlene Nagel – MARC, Director of Community Development  
Mary Smith – SEMA, Hazard Mitigation Specialist  
Justin Sorg – FEMA, Community Mitigation Planner  
Jennifer Storey – SEMA, Lead Planner/Hazard Mitigation Specialist  
Laura Whitener – FEMA, Hazard Mitigation Planning Grant Specialist  
Michelle Wolf – FEMA, Community Mitigation Planner

**Welcome and Introductions**

Marlene welcomed everyone and thanked them for traveling to Kansas City and downtown. Self-introductions were made.

**Review of Plan Requirements/Changes**

Laurie stated that the handbook and review guide is the same as last time. There are, however, some different areas of emphasis identified in this planning cycle as it relates to mitigation strategies. They would like to see mitigation strategies follow the SMART (Specific, Measureable, Attainable, Realistic, Timely) principles. They are looking at the quality of mitigation strategies over quantity. Per location, maybe identify the top 2 or 3 strategies to focus on. She stressed that the strategy should be more specific and the implementation of the strategy be identified. She also stated that the actions should be comprehensive in nature and not just those for FEMA. She also passed out and reviewed mitigation planning resources that are available.

Justin stated that there is a nation-wide effort to quantify the return on investment. There needs to be a focus on how local communities are implementing plans and that there is a reduction of impact from disasters over time. Justin spoke briefly about the NDF (National Disaster Fund) which focuses on infrastructure mitigation. There is an annual appropriation made (6% set aside). Although the rules are still to be promulgated, it will be a competitive applicate process and the project needs to be include in the communities mitigation plan.

Erin asked about the inclusion of man-made disasters or do we just focus on natural hazards. Last time we tried to tie the plan to the THIRA and it was exhausting to those involved. We want to focus on mitigation hazard strategies and strengthening them. What are the states thoughts on limiting hazards?

Heidi indicated the state plan references the THIRA and other plans can reference their THIRA as well but it doesn't mean you have to include mitigation strategies on each one. Laurie indicated that the state has profiled all of them but the format guides only include the natural hazards. The consensus is if you only look at the natural hazards you can focus more on mitigation strategies – there are more similarities if you address only the natural. Erin indicated it would be easier to build in long-term effects.

Marlene asked about potential additional monies in the future referring to Justin's comments about the NDF – if only focusing on natural disasters would reduce our change for potential funding in the application process. Marlene spoke about MARC's Cyber Security framework – would funding be available for these if we include them in our mitigation strategies. Laura indicated that most FEMA grants are focuses on natural disasters. Erin stated they we can still acknowledge the man-made but focus on the natural disasters. Jason indicated that there is still tension between the THIRA and mitigation planning and strategies.

Laurie pointed at that the new format guide includes the community rating system and how to maximize points for planning. She suggested that we utilize the coordinator's manual. For each hazard section, there is a bulleted resource list for each of the hazards. To maximize points, floorplan managers must be involved; extra points for public works on planning committee.

Laurie also spoke about climate adaptation – it is a requirement for states to include it. Each hazard has a section called Changing Future Conditions. Including climate is forward thinking. It is probably going to come with the next update.

### **Overview of MARC Planning Process/Timeline**

Marlene posed the question, "How do we better engage stakeholders and account for their involvement in the process?" Previously, we have mainly involved Emergency Management. We are planning to make an intentional effort to reach out to city planners, public works, city administrators, preparedness officials, schools, etc. Marlene explained the many committees MARC is involved with and have established partnerships in place already. We will be including many of these on our formal planning team. Marlene indicated that our Land Use/Environment team are already involved in some studies that can be included.

Laurie indicated that all of these are great partnerships. She indicated that there is a new tool to help identify "repeat offenders" and that public works can have a role in this as well. Laurie stated that it is hard to move away from Emergency Management to planning – response versus mitigation. Erin stated that we need jurisdiction to develop their local teams and it just not be a MARC thing. Justin added that same for it just not being a FEMA thing.

Donna indicated that as we move forward, we should consider paring outside community experience with local community. She indicated that Independence brought everyone together during the last planning cycle and it was valuable. We should also incorporate mitigation strategy discussions in meetings that are already going on.

Marlene reviewed the timeline. Looking to have a kickoff meeting in the first quarter of next year to include some outside speakers. Teresa suggested we sell the process as a tool – have a plan even if it's something small. Erin indicated that we would be including all jurisdictions to the kick off meeting. She thought Ray County may have received some additional funding as a result of their plan – we would want to include them. Donna stated we need to focus on the benefits to the community versus

regulations and add some community examples. Other options to include would be the presentation Tom Kines (?) showed about Brush Creek. We can also show HMA grants for the area. Marlene asked if there was a trend to including mapping of flood plans outside of the “100 year flood plan?” Laurie indicated that there are now depth map grids available for most communities that will now show even a 10 or 50-year plan.

Laurie spoke about FEMA’s two “moon shots”:

- Double flood insurance (MO is currently around 20%)
- Increase mitigation investments 4X

Justin suggested we reach out to James Walton from Kansas City MO Water Services. He has done many presentations. We need to move from “getting out of the flood plan” to “structure-based risk”. Floodsmart.gov has all of this information. How flood insurance is written in the future is changing.

Laurie indicated that the state plan has regrouped hazards and we can follow them or not. It tends to make assessments easier if grouped together. All of the maps in the plan are available on the map viewer – Appendix A in the plan is the user guide.

Laurie said that there is not a required action for every hazard. It’s okay if actions are moved (include reason). It is expected that some priorities will shift. Maybe reword some to be more specific.

Erin indicated that we may host a workshop focused on mitigation activities – what it can look like. Last time was up to the local jurisdictions.

- Plans can be amended – you can add actions.
- Teresa, what are your priorities that can tie into funding? Don’t make each community think they have to look the same – not a cookie cutter approach.
- Donna, make a suggestion to pick top 3 or top 5. What are you doing, what has taken place, is anything in your long-range plan.

Laurie addresses problem statements - this is the “so what” at the end of the risk assessment. We move from risk assessment to problem statement to mitigation activity. Ask the question, “What has the public works department been doing after every storm?”

Teresa indicated that for any mitigation action you should be able to file an NOI (notice of interest) – helps get a real life mind set. Ask the question, “What could I do if I had the money?”

Justin indicated that jurisdictions need to ask the question, “What is my vulnerability to [X] hazard?”

Lurie - critical faculties info from last time really good.

Laurie stated that when a disaster occurs, that is the time to look at mitigation plan to see if it was listed and get that info to the right people and maybe get the right funding to mitigate.

HMA funding project application must be consistent with hazard mitigation plan

Erin did point out that one thing we do internally is that anytime we have a regional event we do discuss it - but don't discuss mitigation efforts.

Justin suggested that we look at developing some jurisdictional strategies.

Donna asked where in the planning process should the come up multijurisdictional strategies ( i.e. Smithville lake could affect communities downstream).

Marlene thanked everyone for coming.

# Hazard Mitigation Meeting Nov 28, 2018

	<u>Name</u>	<u>Organization</u>	<u>email</u>	<u>phone</u>
1.	Evelyn L	MARC	elynnl@marc.org	816-701-8390
2	John Davis	MARC	jdavis@marc.org	
3	Mary Smith	SEMA	mary.smith@sema.dps.mo.gov	573 526 9353
4	Donna Martin	MARC	dmartin@marc.org	816 701-8369
5	<del>HEIDI CARVER</del>	<del>SEMA</del>	<del>HEIDI.CARVER@SEMA.DPS.MO.GOV</del>	<del>573 526 9116</del>
4	Laurie Bestgen	FEMA	laurie.l.bestgen@fema.dhs.gov	202-705-5573
7.	Michelle Wolfe	FEMA	michelle.wolfe@fema.dhs.gov	
8	Laura Whitener	FEMA	Laura.Whitener@fema.dhs.gov	
9	Marlene Nagel	MARC	mnagel@marc.org	816 701 8218 (573)
10	Jennifer Storey	SEMA	jennifer.storey@sema.dps.mo.gov	526-9283 (573)
11	Teresa Lehman	SEMA	Teresa.Lehman@sema.dps.mo.gov	526-9243
12	Justin Sorb	FEMA	justin.sorb@fema.dhs.gov	(202) 705-6044
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Kansas City Regional

# Hazard Mitigation Plan

## Protect Your Community from Disaster by Planning for Resilience | Register Today!

*Join us for the Regional Hazard Mitigation Plan Kickoff Meeting on Tuesday, April 2, 2019.*

**Overview:** The Mid-America Regional Council invites you to hear from a national leader on the importance of hazard mitigation planning to reduce risks to your community. The **Kansas City Regional Hazard Mitigation Plan** is prepared and adopted every five years and enables local jurisdictions to reflect on hazards posing the greatest risks to their communities and identify meaningful steps to reduce the impact of those risks. The plan for jurisdictions in Cass, Clay, Jackson, Platte and Ray counties is currently in development. Counties on the metro's Kansas side are also in the process of completing their plan and can benefit from attending this meeting. Local governments must adopt the plan by early 2020.

**Keynote Presentation:** Our keynote speaker is Linda Langston, director of strategic relations at the National Association of Counties (NACo), and former supervisor of Linn County, Iowa. Langston will discuss the importance of hazard mitigation planning and preparing for disasters, and why local governments should care.

**Topics:** Additional topics to be covered include:

- What are the hazard mitigation requirements for local plans?
- Do all jurisdictions face the same challenges?
- Have the challenges changed over the past five years?
- How are risks changing with climate change or other conditions?
- What actions have local governments taken to mitigate hazards and what results did they achieve?
- Which strategies are most effective in mitigating hazards?

**Speaker Bio:** Linda Langston is NACo's director of strategic relations and former president. Her presidential initiative at NACo was Ready and Resilient Counties. She served as the Linn County, Iowa, supervisor for over 13 years. During Langston's tenure with Linn County, the community experienced a flooding disaster, which changed her perspective about how to address recovery and mitigation efforts. She is the chair of the Resilient America Roundtable for the National Academy of Sciences and is a member the National Advisory Council for the Federal Emergency Management Agency, where she serves as the chair for the federal insurance and mitigation sub-committee.

Register at [marc2.org/htmlmail/emergency/2019\\_Hazard\\_Mitigation\\_Kickoff.htm](http://marc2.org/htmlmail/emergency/2019_Hazard_Mitigation_Kickoff.htm).



**Keynote Speaker:**

Linda Langston, Director of Strategic Relations, National Association of Counties

**Date:** April 2, 2019

**Time:** 8–11:45 a.m.

**Location:**

Kauffman Foundation Conference Center  
4801 Rockhill Road  
Kansas City, MO 64110

**Register Today!**


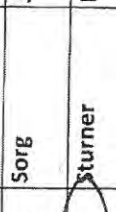


**Cost:** Free to attend.

**Questions?** For more information, contact John Davis at [jdavis@marc.org](mailto:jdavis@marc.org) or Marlene Nagel at [mnagel@marc.org](mailto:mnagel@marc.org).



# KC Regional Hazard Mitigation Plan Kick-Off Meeting

Tuesday, April 2, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
KY	Smith	Kenny	City of Lake Winnebago	hogheadpc@comcast.net	8165915259
	Sorg	Justin	FEMA Region VII	justin.sorg@fema.dhs.gov	202-705-6044
	Sturner	Pete	Platte County - Sheriff's Office	petesturner@aol.com	816-518-6789
present	Sunshower	Joanne	First Lutheran Church	mjndful@gmail.com	816-908-4929
present	Teufel	Shelby	City of Pleasant Hill	shelbyt@pleasanthill.com	816-540-3135
	Todd	Dennis	City of Lake Waukomis	dennistodd1996@gmail.com	816-741-2079
	Van Alstyne	Christian	US Department of Justice	christian.van.alstyne@usdoj.gov	816-426-7424
GLW	Walker	Gene	Fishing River Fire Protection District	hotspotfirewalker@yahoo.com	816-509-3234
	Wellington	Joe	Platte City Police Department	jwellington@plattacity.org	816-858-4395
	Weyand	Kevin	Olathe Fire Department	kweyand@olatheks.org	913-971-7955
	White	Jackie	City of Grandview	jwhite@grandview.org	
MW	Wolfe	Michelle	FEMA	michelle.wolfe@fema.dhs.gov	
CW	Wagner	Cynthia	City of Smithville	CWagner@smithvillemo.org	816-930-8032
SMT	Hoeger	Steve	KS March HCC	Ks.metrohcc@gmail.com	816-858-2530
TJ	Jacobs	Tam	MARC		
	Carey	Paula	Johnson Co		
KM	Starks	Kara	City of Lee's Summit		816-969-1004



# KC Regional Hazard Mitigation Plan Kick-Off Meeting

Tuesday, April 2, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
<i>present</i>	Odom	Jimmy	Cass County, MO	jimmyo@casscounty.com	816-380-8159
<i>D.P.</i>	Paddock	Dustin	City of Liberty - Fire Department	dpaddock@libertymo.gov	816-439-4310
<i>DP</i>	Pavlich	David	City of Kearney	dpavlich@kearneymo.us	816-903-4731
<i>RMP</i>	Pommenville	Randy	Lenexa Fire Department	rpommenville@lenexa.com	913-895-8458
	Pratt	Kevin	Kearney Fire & Rescue Protection District	kpratt@kearneyfire.org	816-628-4122
	Presberry	Jennifer	MU Extension	presberryj@missouri.edu	573-823-5180
<i>DR</i>	Randolph	Dennis	City of Grandview	drandolph@grandview.org	816-316-4855
<i>TR</i>	Richards	Tim	City of Olathe - Fire Department	trichards@olatheks.org	913-971-7913
<i>Present</i>	Rivarola	Martin	Mid-America Regional Council	mrivarola@marc.org	816-474-4240
<i>present</i>	Roberts	Rob	Miami County, KS	rroberts@miamicountyks.org	913-294-9500
<i>DR</i>	Robeson	Dan	Johnson County, KS - Emergency Management	drobeson@jocogov.org	913-715-1001
	Roy	B. Scott	Northland Regional Ambulance District	sroy@nrad-ems.org	816-858-4550
	Saffell	Eddie	Central Jackson County Fire Protection District	csaffell@cjcfd.org	816-229-2522
<i>CS</i>	Sandie	Chris	City of Blue Springs	csandie@bluespringsgov.com	816-228-0115
<i>SAS</i>	Schulte	Scott	Vireo	scott@bevireo.com	816-777-3039
<i>pld</i>	Schwach	Paula	City of Westwood Hills	schwach3p@gmail.com	913-262-6622
<i>MPS</i>	Sherwood	Mark	City of Oak Grove - Sni Valley Emergency Management	msherwood@cityofoakgrove.com	816-690-3773 x1

# KC Regional Hazard Mitigation Plan Kick-Off Meeting


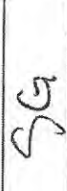
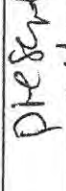
Tuesday, April 2, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Langston	Linda	National Association of Counties		
	Leavens	Joan	Shawnee Mission School District	joanleavens@smsd.org	913-642-9667
	Lee	Shawn		shawn.lee84@icloud.com	
	Lemons	Brett	Northland Regional Ambulance District	blemons@nrad-ems.org	816-858-4450
	Libby	Jeff	Lake Waukomis	KA00TL@yahoo.com	816-863-6987
	Lockridge	Janet	Precise Operations Management, LLC	janet@poperationsmgmt.com	9132193664
	Lockridge	Jason	City of Smithville - Police Department	jlockridge@smithvillemo.org	816-532-0500
	Lubow	Craig	Sierra Club - Kanza Division	alanskoalas@yahoo.com	
	Lynch	Erin	Mid-America Regional Council	elynych@marc.org	816-701-8390
	Manley	Dan	City of Lee's Summit - Fire Department	dan.manley@cityofls.net	816-969-1304
	May	Matt	Unified Government of WyCo/KCK - Emergency Management	mmay@wycokck.org	913-573-6337
	McGovern	Molly	City of Excelsior Springs	mmcgovern@ci.excelsior-springs.mo.us	816-630-9595
	McIntyre	Sherri	City of Kansas City, MO - City Hall	sherri.mcintyre@kcmo.org	816-513-6590
	Miller	Dawn	THFH ARC GKCEH IMA	dawndmiller@gmail.com	8163941853
	Myler	Eric	Harrisonville Emergency Services	emyler@harrisonville.com	816-380-8925
	Nagel	Marlene	Mid-America Regional Council	mnagel@marc.org	816-701-8218
	Nelson	Victoria	City of Lee's Summit - Planning	victoria.nelson@cityofls.net	816-969-1605



# KC Regional Hazard Mitigation Plan Kick-Off Meeting

Tuesday, April 2, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Eden	James	City of Lee's Summit - Fire Department	jim.eden@cityofls.net	816-969-1303
	Elsas	Lisa	Mid-America Regional Council	lisae@marc.org	816-474-4240
	Fisher	Bruce	Blue Valley Public Safety/Cass County Emergency Management	bruce@bvpsonline.com	1-800-288-5120
	Frisby	Al	Merriam City Council	alfrisbyformerriam@gmail.com	913 206 5354
	Gerst	Cary	Johnson County, KS - Emergency Management	cgerst@jocogov.org	913-715-1005
	Gliniecki	Dante	City of Independence - Emergency Preparedness	dgliniecki@indepmo.org	816-325-7133
	Goldman	Jakob	Mid-America Regional Council	jgoldman@marc.org	816-701-8307
	Greiner	Savannah	student	vannahgreiner@gmail.com	
	Heermann	Jay	Mid-America Regional Council	jheermann@marc.org	816-701-8252
	Hinkle	Geoff	City of Independence Emergency Preparedness	ghinkle@indepmo.org	816-325-6960
	Hufford	Billie	City of GrandView - Community Development	bhufford@grandview.org	816-316-4823
	James	Jason	Northland Regional Ambulance District	james@nrad-ems.org	816-858-4450
	Joseph	Jeff	Leavenworth County Planning and Zoning	JJoseph@leavenworthcounty.org	913-684-0465
	Kanter	Carolyn	City of Westwood Hills	carcan118@outlook.com	916 210 5312
	Kelly	Mike	City of Roeland Park	mkelly@roelandpark.org	913-722-2600
	Kirkland	Adam	Kearney R1 School District	kirklanda@ksdr1.net	8168720030
	Krahenbuhl	Tom	City of Pleasant Hill	tkrahenbuhl@pleasanthill.com	816-540-3135

# Roster

## KC Regional Hazard Mitigation Plan Kick-Off Meeting

73 in attendance

Tuesday, April 2, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
AMA	Abel	Alysen	City of Parkville	aabel@parkvillemo.gov	816-741-7676
<i>[Signature]</i>	Akin	Will	Clay County Sheriff- Emergency Management	wakin@sheriffclayco.com	
<i>[Signature]</i>	Austin	Lewis	City of Grandview - Fire Dept.	LAustin@grandview.org	816-316-4961
SB	Baharaeen	Sasan	Mid-America Regional Council	sasan@marc.org	816-701-8235
	Bailey	Andy	National Weather Service		816-540-6125
<i>[Signature]</i>	Bazzano	Jon	Clay County Sheriff's Office - EM	jbazzano@sheriffclayco.com	816-407-3732
<i>[Signature]</i>	Belcher	Chet	City of Olathe	cdbelcher@olatheks.org	913-971-8500
<i>[Signature]</i>	Bennett	Scott	Unified School District 204	bennetts@usd204.net	9132724350
Present	Bestgen	Laurie	Federal Emergency Management Agency	laurie.l.bestgen@fema.dhs.gov	202-705-5573
<i>[Signature]</i>	Borders	Stuart	City of Independence	sborders@indepmo.org	816-325-7421
Present	Brooks	Carl	City of Peculiar	cbrooks@cityofpeculiar.com	816-779-2228
	Burns	Kyle	City of Overland Park	kyle.burns@opkansas.org	913-895-8308
BFC	Connelly	James	City of Kansas City, MO - Emergency Management	james.connelly@kcmo.org	816-513-8601
AMC	Couch	Catherine	Mid-America Regional Council	ccouch@marc.org	816-701-8389
Present	Daugherty	Sean	Gladstone Public Safety	seand@gladstone.mo.us	816-469-9712
Present	Davis	John	Mid-America Regional Council	jdavis@marc.org	816-701-8394
<i>[Signature]</i>	Dawson	Beth	Mid-America Regional Council	bdawson@marc.org	816-474-4240



## 2020 Hazard Mitigation Plan Kick-Off Meeting Table Discussion Notes

Hazard	What Strategies should local jurisdictions consider?
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Diversity – water suppliers when possible</li> <li>• Improve infrastructure (water)</li> <li>• Designate cooling centers (faith based org; community centers)</li> <li>• Improve communication strategies to vulnerable populations.</li> <li>• Establish thresholds to institute water rationing/conservation programs</li> </ul>
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Improve water system</li> <li>• Interconnect water mains</li> <li>• Increase tower storage</li> <li>• Public education</li> </ul>
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Examine and strengthen public water works to better rely for hydration during extreme temperatures of where the MO river is contaminated from salt, chemical , waste</li> <li>• Review community insurance to account for litigation costs in defense of climate catastrophe liability</li> </ul>
Drought/Extreme Temperatures	<ol style="list-style-type: none"> <li>1. More cooling stations/shelters.               <ol style="list-style-type: none"> <li>a. Not just the number, but the distribution needs to mirror where people are most likely to not have air conditioning.</li> </ol> </li> <li>2. Drought-resistant plantings.</li> <li>3. Cities need to evaluate where do you get your water from – intakes on big rivers, aquifers, reservoir, wells and how susceptible they are to weather events, floods as well as droughts.</li> <li>4. More green infrastructure, plantings to keep water in the ground and reduce heat island</li> </ol>
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>• Focus on preparedness and public education</li> <li>• Early warning notification</li> <li>• Utility protection (buried utility)</li> <li>• Mass care and shelter for community of need</li> </ul>
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>• Mass notification system</li> </ul>
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>• Road pretreatment</li> <li>• Snow removal plan</li> <li>• Snow routes</li> </ul>
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>• Tree trimming</li> <li>• Generators for school and city hall</li> </ul>
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>• Cooling centers during extreme heat</li> <li>• Warming centers during cold temperatures</li> <li>• Emergency funding reserve</li> </ul>

	Generators
Severe Winter Weather/Temperatures	<ul style="list-style-type: none"> <li>● Generators</li> <li>1. Push to bury lines.               <ul style="list-style-type: none"> <li>a. But who pays? Cost should be shared by the municipality and the utility.</li> <li>b. This is a recurring cost. Ideally, would bury instead of repair the old system, but power must be restored ASAP, so this is not an option. Therefore, need a long-term program results in all lines buried over a period of 10-20 years. Payback is the avoidance of a recurring cost.</li> </ul> </li> <li>2. Right tree in right place? More education needed.</li> <li>3. Keep trees trimmed.               <ul style="list-style-type: none"> <li>a. Cities could inventory problems. Utility will trim trees along the main lines, but not the service lines to house.</li> </ul> </li> </ul>
Flooding – riverine and flash flooding	<ul style="list-style-type: none"> <li>● Community rating system – it’s free, only requires a community assessment visit (CAV) from FEMA</li> <li>● Storm water management program w/ buyouts – determine how you plan impacts other jurisdictions – collaborate programs with other jurisdictions</li> <li>● Outreach improvements – more education, more community involvement</li> <li>● Early warning systems – improve or develop programs that collaborate w/ upgradient communities. Better inundation maps.</li> <li>● Improve and enforce codes &amp; develop regulations in and around SFHAs</li> </ul>
Flooding – riverine and flash flooding	<ul style="list-style-type: none"> <li>● Stream buffers</li> <li>● Updated KCAPWA regs</li> <li>● Land use/ storm water detention</li> <li>● Storm water BMPs</li> </ul>
Flooding – riverine and flash flooding	<ul style="list-style-type: none"> <li>● Army Corp of Engineers contractors hired for advisory opinions on existing an future infrastructure requirements to minimize damages and maximize safety</li> <li>● Ecological disaster resulting from salt and chemicals and waste running off into local water and then running downstream</li> <li>● Reserve for legal injunctions against causes of flooding and financial reserve for litigation against bad actors</li> </ul>
Flooding – riverine and flash flooding	<ul style="list-style-type: none"> <li>● Comprehensive Plan and flood plain management reg land</li> <li>● Use incentive to focus development</li> <li>● Adopt community rating system</li> <li>● Adopt storm drainage regulations (hold water)</li> <li>● Buyout of structures w/ repeated flood losses</li> <li>● Design and construction of public infrastructures</li> <li>● Green infrastructure improvements – green streets</li> <li>● Warning systems</li> <li>● Continue in NFIP</li> <li>● Enforce building codes and manage new construction</li> </ul>
Flooding – riverine and flash flooding	<ul style="list-style-type: none"> <li>1. Green infrastructure (like in Marlborough).</li> <li>2. Better oversight of Army Corps of Engineers – management – make flood control a higher priority.</li> <li>3. Plan review – stormwater, quality and quantity. What impact impervious has downstream and upstream.</li> </ul>

	<p>a. What floodplain are we talking about – tiered strategy. One set of strategies for those in 1% risk flood plain, one set of strategies for those in .2% risk flood plain</p> <ul style="list-style-type: none"> <li>i. Such as, building floor must be 1 foot above the elevation for a .2% flood risk</li> </ul> <p>b. Less parking, so less impervious surface.</p> <ul style="list-style-type: none"> <li>i. Pervious pavement has higher maintenance cost.</li> </ul> <p>c. Stormwater detention.</p> <p>d. More uniform application of the such restrictions.</p> <ul style="list-style-type: none"> <li>i. Not all local governments have them.</li> <li>ii. Developers always oppose or want to weaken them.</li> <li>iii. New development may make what was done previously insufficient, so much make the new development take care of the additional burden it is creating.</li> <li>iv. Need to plan for entire areas, not just piecemeal development</li> </ul>
Severe Thunderstorms	<ul style="list-style-type: none"> <li>• Awareness of importance of safe rooms &amp; providing incentives &amp; reducing barriers to safe room development</li> <li>• Protect buildings and at-risk populations from hail, lightning and wind</li> <li>• Increase risk awareness</li> <li>• IBC – adopt international building code &amp; IRC</li> </ul>
Severe Thunderstorms	<ul style="list-style-type: none"> <li>• Early warning systems</li> <li>• Building codes</li> <li>• Public education</li> <li>• Tree trimming</li> <li>• Ban Bradford pears and hybrids</li> </ul>
Severe Thunderstorms	<ul style="list-style-type: none"> <li>• Buried utilities</li> <li>• Better warning systems. Reducing segmented warming system</li> <li>• Incorporate technology</li> <li>• Continuing legal education. Money in the budget for it.</li> <li>• Generators</li> </ul>
Severe Thunderstorms	<ol style="list-style-type: none"> <li>1. Again, building codes need to be adopted       <ul style="list-style-type: none"> <li>a. Such as new apartments being anchored from top to bottom so can't be moved by wind, even if windows blow out</li> <li>b. Laminated glass, to make sure that blowing debris can't enter the house and injure people</li> <li>c. Most of KC is on the 2012 ICC codes. Getting ready to uniformly adopt 2018 codes, which support such advances and also increased energy efficiency.           <ul style="list-style-type: none"> <li>i. KS and MO will be all be on same codes for the first time. Effort led by the metro Fire Marshalls and Building inspectors.</li> </ul> </li> <li>d. Retrofitting is a big problem – codes don't apply to older structures.           <ul style="list-style-type: none"> <li>If do an upgrade, then can enforce the retrofitting</li> </ul> </li> </ul> </li> </ol>
Tornadoes	<ul style="list-style-type: none"> <li>• Bury utilities</li> <li>• Public awareness &amp; drills particularly with vulnerable populations</li> </ul>


	<ul style="list-style-type: none"> <li>Encourage hardened areas. Cost of installation for safe rooms; non-starter challenge particularly with apartments and schools. FEMA/ICC standards cost prohibitive.</li> <li>Educate where community safe rooms are located</li> <li>Lack of understanding by people who didn't grow up with siren system</li> <li>Inability to hear sirens inside buildings</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Mass notification system</li> <li>Post public signs on all shelter – ARC, etc.</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Building codes</li> <li>Storm shelters / safe rooms</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Tree trimming</li> <li>Generators for school and city hall</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Safe rooms; as amenities in new development, require for manufacture home developments</li> <li>IBC codes</li> <li>Generators</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Enforce community rating system</li> <li>Data collection is a priority</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>Homes without basements and vulnerable areas/populations</li> <li>Public awareness of shelter awareness</li> <li>Construction of safe rooms</li> <li>Promote site design &amp; building standards</li> <li>Public awareness activities (including drills)</li> <li>Install storm sirens or use mobile app for take shelter notification</li> <li>Identify &amp; place signs on public shelter spaces</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>New building codes – see above—to make new buildings more resilient to high winds</li> <li>Requiring new apts having safe rooms. In each building, sprinkled with bathrooms.</li> <li>More community shelters</li> <li>Upgrade older style sirens <ul style="list-style-type: none"> <li>These are turned on using radio frequencies–VHF.</li> <li>Can put them all on a digital radio system and check silently so they only go off if there is an emergency.</li> </ul> </li> <li>Educate public on the various alternatives for receiving alerts – what works for you the best. <ul style="list-style-type: none"> <li>Sirens are only meant to be heard if you are already outside.</li> <li>Wider adoption of weather radios (with flashers if hearing impaired)</li> <li>Knowing how to receive alerts on cell phones, apps to download</li> </ul> </li> </ul>
Other – earthquakes	<ul style="list-style-type: none"> <li>More seismometers for the Hiawatha fault to monitor if activity is increasing.</li> </ul>

Hazard	Should this be a priority hazard? Why or Why not?
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Appear to have high equity component – may affect lower income areas harder</li> <li>• Impacts water restrictions &amp; potentially housing foundations</li> <li>• Yes, extreme temperatures are a high priority than drought. Will be more significant as climate changes</li> </ul>
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Yes. This hazard has multiple impacts &amp; causes significant stress on our population</li> <li>• There are an increasingly number of water breaks associated with high heat.</li> <li>• This has an impact on the firefighting capability as well as infrastructure – drought conditions continue to create high fire danger situations.</li> <li>• Wildland/urban interface issues are growing.</li> <li>• Extreme cold temperatures also have impacts on infrastructure and public health.</li> <li>• Add fire as a part of drought – fires tend to accompany drought events</li> </ul>
Drought/Extreme Temperatures	<ul style="list-style-type: none"> <li>• Yes, potentially affects loss of power, outdoor activities and safety</li> <li>• Yes, dangerous and most frequent</li> <li>• Potential to consolidate with tornadoes and flooding</li> <li>• Issue – still need to communicate with public. May be different strategies than for tornadoes.</li> </ul>
Severe Thunderstorms	<ul style="list-style-type: none"> <li>• Yes, severe thunderstorms are unpredictable</li> <li>• Can cause lots of damage on all type of structures from road closures, homes, businesses, automobiles</li> <li>• Include people from all responders to help with clean up</li> <li>• Lee’s Summit and Johnson County experience many storms on an annual basis</li> <li>• Yes - priority</li> </ul>
Severe Thunderstorms	<ul style="list-style-type: none"> <li>• Yes, still relevant in the area</li> <li>• Yes, dangerous and frequent</li> <li>• Yes, tornadoes are a priority,</li> <li>• Given the frequency of events in Lee’s Summit and Johnson County more recently, this is a priority hazard</li> <li>• The loss of utilities, particularly electricity, has an adverse impact.</li> <li>• Damage to infrastructure, building and tree loss can hamper response and recovery</li> <li>• Yes, maybe consider severe thunderstorms with tornadoes</li> <li>• Yes, this need to continue to be a priority</li> </ul>
Tornadoes	<ul style="list-style-type: none"> <li>• Yes, still relevant in the region – both riverine and flash flooding</li> <li>• Consider adding dam &amp; level failures which have an impact on flooding</li> <li>• Yes, riverine and flash flooding are both priorities</li> <li>• Also, add urban flooding that may not rise to level of disaster declaration</li> <li>• Also, snow melt as a contributor to riverine flooding impacts to water supply</li> </ul>
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Flooding – Riverine and Flash Flooding	<ul style="list-style-type: none"> <li>• Yes, Lee’s Summit and Johnson County both struggle with floods and flash flooding which pose public risk,</li> <li>• Floods cause significant man-power on the part of multiple departments and jurisdictions</li> <li>• Floods cause public risk hazards, particularly flash floods w. inundated roads &amp; transportation struggles.</li> <li>• Properties in flood plains are problematic on smaller scale but pose risk to residents, in evacuation, then cleanup and rebuild, which become significant burdens both financially and emotionally</li> </ul>
Flooding – Riverine and Flash Flooding	<ul style="list-style-type: none"> <li>• Water supply, water integrity. Flooding effects on intake.</li> <li>• Also mentioned the terrorism aspect to water supply.</li> </ul>
Flooding – Riverine and Flash Flooding	<ul style="list-style-type: none"> <li>• Yes – Priority hazard</li> <li>• Dam safety as part of flash flooding</li> </ul>
Severe Winter Weather	<ul style="list-style-type: none"> <li>• Yes, seems to cyclical right now but high impact when occurring, affecting multiple jurisdictions at the same time.</li> <li>• Including windstorms</li> </ul>
Severe Winter Weather	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Power disruption – warming centers</li> <li>• Debris removal</li> <li>• Snow removal</li> <li>• Molting – flooding</li> <li>• Transportation impacts</li> </ul>
Severe Winter Weather	<ul style="list-style-type: none"> <li>• Yes, monitoring weather trends historically, the region has been impacted by multiple severe weather events that impact: utilities, lodging/sheltering and transportation/travel</li> </ul>
Severe Winter Weather	<ul style="list-style-type: none"> <li>• Yes - priority</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Earthquakes - fracking</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Earthquakes</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Solar Flares – impacts on electrical grid, loss of power</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Volcanic eruptions - ash</li> </ul>
Placed in order by one group	<ol style="list-style-type: none"> <li>1. Flooding – top of the list, flash or river.</li> <li>2. Severe Thunderstorm – seen more in the last few years (anecdotally). In addition to causing flash flooding, hail and power outages are the chief risk</li> <li>3. Tornadoes – increasing in frequency, intensity also increasing. This one ranks equally with Severe Thunderstorms – much less frequent but much more severe</li> <li>4. Drought – mainly Heat-related deaths</li> <li>5. Severe Winter weather – winter was bad last year, but hadn’t been. Plus it wasn’t really severe, just long. Haven’t had this in quite a while. Potential for more widespread, longer power outages in an ice storm.</li> <li>6. Earthquake – Hiawatha in NE KS. Dormant now, but could awaken, especially if New Madrid goes. Only one Seismometer to monitor it.</li> </ol>


**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLANNING**



**PLAN UPDATE  
KICKOFF MEETING  
APRIL 2, 2019**




1



**AGENDA**

- **Welcome & Introductions,  
Commissioner Jimmy Odom**
- **Keynote Presentation: Linda  
Langston, National Assoc. of Counties**
- **Panel Discussion –Molly McGovern,  
Sean Daugherty, Dante Gliniecki, and  
Laurie Bestgen**

2



## AGENDA

- **FEMA Grants to Address Hazard Mitigation – Laurie Bestgen, FEMA**
- **Hazard Mitigation Plan Requirements, John Davis**
- **Priority Natural Hazards and Possible Mitigation Strategies, Marlene Nagel**
- **Table Discussions**
- **Next Steps**

3



## KEYNOTE SPEAKER



### Linda Langston

- **Director of Strategic Relations, National Association of Counties**
- **Former supervisor of Linn County, Iowa.**
- **Chair of the Resilient America Roundtable, Natl Academy of Sciences**
- **Member the National Advisory Council for FEMA, and chair for the federal insurance and mitigation subcommittee.**

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## LINN COUNTY IOWA – JUNE 2002

**Election Day can't come soon enough**

**Dry Creek becomes raging waterway**

**Frustrated flood victims to speak out**

**Langston: Flooded, immersed in race**

**Floods dampen Langston's win**


**Floods ravage Marion parks**

**Flooding wipes out roads and bridges**

**City Under Water; Primaries Stay Afloat**

The image is a collage of newspaper clippings from June 2002. It features several headlines related to flooding in Linn County, Iowa, and the political situation of Linda Langston. The headlines include: 'Election Day can't come soon enough', 'Dry Creek becomes raging waterway', 'Frustrated flood victims to speak out', 'Langston: Flooded, immersed in race', 'Floods dampen Langston's win', 'Floods ravage Marion parks', and 'Flooding wipes out roads and bridges'. A large headline at the bottom reads 'City Under Water; Primaries Stay Afloat'. There are also several photographs showing people and flooded areas.

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## LINDA LANGSTON - RESOURCES

- National Association of Counties  
[www.naco.org](http://www.naco.org)
- National Academy of Sciences, Resiliency America Roundtable
- <http://sites.nationalacademies.org/pga/resilientamerica/>

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## PANEL DISCUSSION

- Molly McGovern, City Administrator, Excelsior Springs, MO
- Sean Daugherty, Division Chief, Gladstone, MO Fire
- Dante Gliniecki, Independence Emergency Preparedness Division
- Laurie Bestgen, Hazard Mitigation Planner, FEMA

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## WHAT IS MITIGATION?

Sustained action taken to reduce or eliminate long-term risk to life and property from hazard events

Mitigation planning is a process to:

- Identify hazards that pose risk
- Assess the potential impacts
- Develop goals, objectives, and actions to reduce impacts
- Set priorities and implement mitigation actions.

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## PANEL DISCUSSION

- What hazards have impacted your community or communities you have worked with?
- What mitigation strategies would have been beneficial to have implemented prior to the disaster?
- What strategies have you put in place that you would recommend to others?

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**RiskMAP**  
Increasing Resilience Together



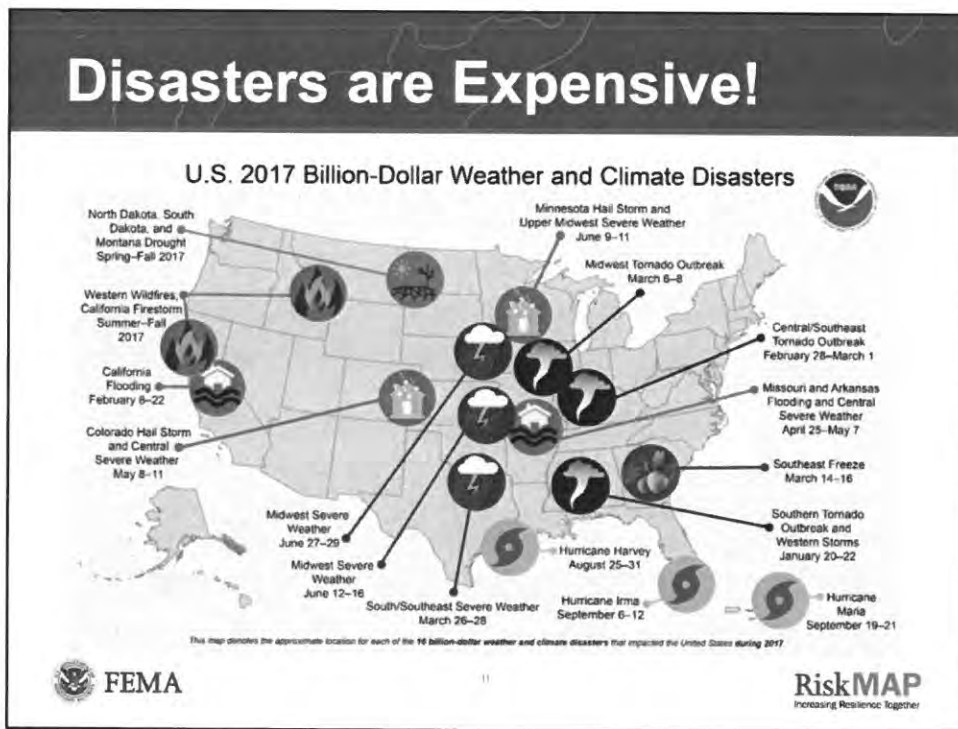
## Funding Sources for Hazard Mitigation

Laurie Bestgen, FEMA RVII Mitigation Planner



**FEMA**

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## Region VII Disaster Totals (Missouri, Iowa, Kansas, Nebraska)

- **264 Presidential Disaster Declarations since 1953**
  - Average approximately 4 disasters/year
- **Federal Funding Assistance since 2005**
  - \$3.494B in Public Assistance (approximately \$291M in annual PA costs)
  - \$1.087B in Hazard Mitigation Assistance
  - \$812M in Preparedness Grants (SHSGP, UASI, EMPG, etc.)

**Source:** <https://www.fema.gov/data-visualization>

**FEMA** **RiskMAP**  
Increasing Resilience Together

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### Federal Funding Assistance KC MO Metro Counties (Cass, Clay, Jackson, Platte, Ray)


<p>▶ <b>34 Presidential Disaster Declarations since 1998 (Average 1.5 per year)</b></p>	Cass	19
	Clay	22
	Jackson	23
	Platte	22
	Ray	28


<p>▶ <b>\$52,431,831 In Public Assistance since 2002 (Over \$3M Annual Average)</b></p>	Cass	\$2,434,840
	Clay	\$2,971,431
	Jackson	\$34,217,565
	Platte	\$7,190,629
	Ray	\$5,617,366
	<b>Grand Total</b>	<b>\$52,431,831</b>

**\$38,867,324 in Hazard Mitigation Assistance since 1993**




FEMA








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## Natural Hazard Mitigation Saves




**Natural Hazard Mitigation Provides the Nation \$6 in Benefit for Every \$1 Invested**


National Benefit-Cost Ratio (BCR) Per Peril <small>*BCR numbers in this study have been rounded</small>	Beyond Code Requirements	Federally Funded
<b>Overall Hazard Benefit-Cost Ratio</b>	<b>\$4:1</b>	<b>\$6:1</b>
 <b>Riverine Flood</b>	<b>\$5:1</b>	<b>\$7:1</b>
 <b>Hurricane Surge</b>	<b>\$7:1</b>	<small>Too few grants</small>
 <b>Wind</b>	<b>\$5:1</b>	<b>\$5:1</b>
 <b>Earthquake</b>	<b>\$4:1</b>	<b>\$3:1</b>
 <b>Wildland-Urban Interface Fire</b>	<b>\$4:1</b>	<b>\$3:1</b>

This Interim Study quantified a number of benefits from mitigation, including reductions in:

- Future deaths, nonfatal injuries, and PTSD
- Repair costs for damaged buildings and contents
- Sheltering costs for displaced households
- Loss of revenue and other business interruption costs to businesses whose properties are damaged
- Loss of economic activity in the broader community
- Loss of service to the community when fire stations, hospitals, or other public buildings are damaged
- Insurance costs other than insurance claims
- Costs for urban search and rescue



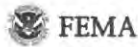
FEMA



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## FEMA Funding for Hazard Mitigation Actions

- **Hazard Mitigation Grant Program (HMGP)**
- **HMGP-Post Fire**
- **Pre-Disaster Mitigation (PDM)**
- **Flood Mitigation Assistance (FMA)**
- **Public Assistance Mitigation (406 Mitigation)**



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## FEMA Hazard Mitigation Assistance (HMA) Grants Hazard Mitigation Grant Program (HMGP)

- **With a FEMA-Approved Hazard Mitigation Plan**
- **After a Presidentially-Declared Disaster**
- **Available Statewide (not limited to declared counties)**
- **Available funds**
  - 15% of total disaster grants \*awarded by FEMA for States with approved Standard State Plan
  - 20% of total disaster grants\* awarded by FEMA for States with approved Enhanced State Plan
  - MO is one of 11 States in the nation with an Enhanced State Plan
- **Cost Share is 75% Federal/ 25% Local**

\*up to first \$2 billion, thereafter based on a sliding scale



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## FEMA Hazard Mitigation Assistance (HMA) Grants HMGP Post-Fire

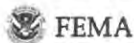
- **Mitigation Assistance using HMGP for Fire Management Assistance declarations in addition to Presidential Disaster Declarations.**
- **The application period is 6 months from the date of applicant funding notification, and extensions may be requested.**
- **The focus of the project should be fire mitigation but can be opened up to all HMGP eligible project types.**
- **Available Statewide**



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## FEMA Hazard Mitigation Assistance (HMA) Grants Pre Disaster Mitigation (PDM) Grants

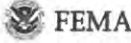

- **With a FEMA-Approved Hazard Mitigation Plan**
- **Annual cycle – application period 10/1 thru 1/31 competitive nationwide**
- **Available funds – varies each Fiscal Year with Appropriations**
  - FY18 - \$235.2 Million
  - \$575,000 allocation for each state and federally recognized tribe
  - Balance awarded on competitive basis
- **Hazard Mitigation Planning has always been a funding priority**
- **Cost Share is 75% Federal/ 25% Local**



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## FEMA Hazard Mitigation Assistance (HMA) Grants Flood Mitigation Assistance (FMA) Grants

- **With a FEMA-Approved Hazard Mitigation Plan**
- **Annual cycle –application period 10/1 thru 1/31 semi-competitive nationwide**
- **Sub-applicant must participate in National Flood Insurance Program**
  - Must provide mitigation benefit to NFIP-insured structures
- **Available funds – varies each Fiscal Year with Appropriations**
  - FY18 - \$160 Million
- **Very limited planning funds – focus is on mitigating Repetitive Loss and Severe Repetitive Loss properties**
- **Cost Share**
  - 75%/25% for insured properties and planning grants
  - 90%/10% for repetitive loss properties
  - 100% Federal for severe repetitive loss

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### Eligible Activities

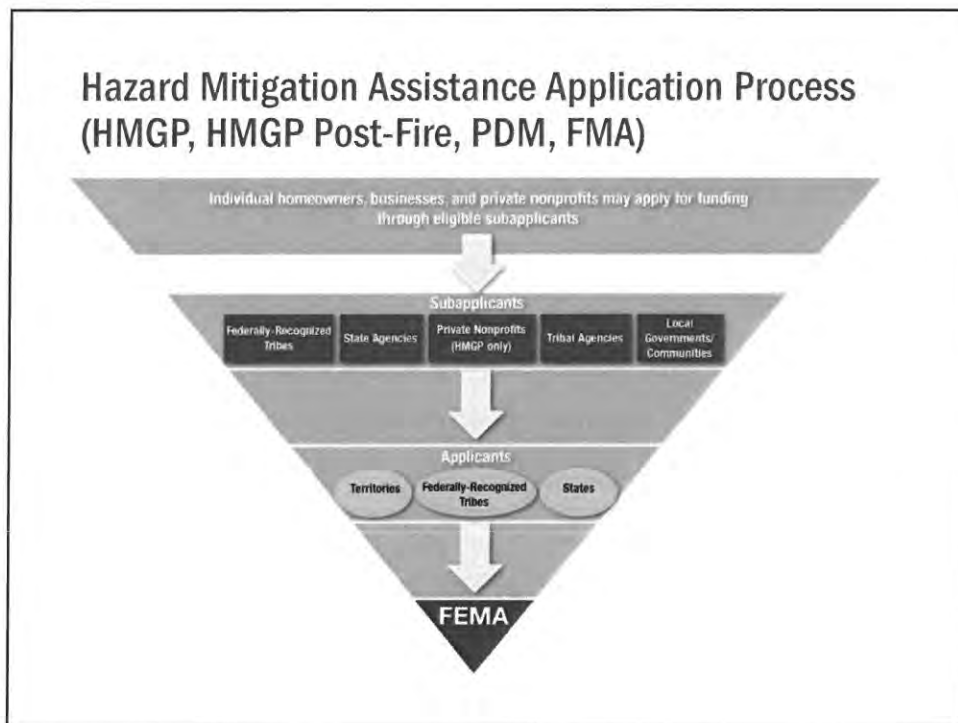
*by HMA Grant Program*

Eligible Activities	HMGP	PDM	FMA
<b>1. Mitigation Projects</b>	✓	✓	✓
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	✓
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk Reduction Projects	✓	✓	✓
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	✓
Wind Retrofit for One- and Two-Family Residences	✓	✓	✓
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	✓
Post-Disaster Code Enforcement	✓	✓	✓
Advance Assistance	✓	✓	✓
5 Percent Initiative Projects	✓	✓	✓
Miscellaneous/Other <sup>(1)</sup>	✓	✓	✓
<b>2. Hazard Mitigation Planning</b>	✓	✓	✓
Planning Related Activities	✓	✓	✓
<b>3. Technical Assistance</b>	✓	✓	✓
<b>4. Management Cost</b>	✓	✓	✓

<sup>(1)</sup> Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available

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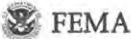





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## FEMA Public Assistance Mitigation 406 Mitigation

- Available under PA Categories C-G for Permanent Work
- Facility must be damaged in declared event
- Must be in declared county
- Incorporate Mitigation into Repair
  - Up to 15% of Repair Cost Available Automatically
  - Up to 100% of Repair Cost Available for Specific Types of Projects
  - Benefit Cost Analysis Required for Mitigation Exceeding 100% of Repair Cost
  - Subject to Cost Share Requirements
- Identify repeat damages sites BEFORE the next disaster and identify for 406 Mitigation in subsequent disasters

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## Disaster Recovery Reform Act (DRRA)

- New Legislation Passed October 5, 2018
- Greater investment in mitigation - before a disaster
- Greater emphasis on Infrastructure
- Reducing risk from future disasters after fire
- Increasing state capacity to manage disaster recovery
- Providing greater flexibility to survivors with disabilities



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## The Funding Problem

- Many mitigation projects require \$\$\$
- HMA/FEMA isn't the only source of funding
  - Local funds
  - Other federal agencies
  - State funding
  - NGOs/Private sector



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## Local funding

- **Levy Taxes for specific project**
- **Capital Improvement Programs**
- **Add Fees for water, sewer, gas, or electrical**
- **Incur Debt Through:**
  - General Obligation Bonds
  - Special Tax Bonds (STARR bonds, TIF)
  - Private Activities



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## Local “No Cost” Actions

- **Building Codes & Standards**
  - Requires design standards for new construction & the repair of existing buildings to be more resistant to hazards.
  - Promotes adoption of building codes with hazard resistant provisions that may exceed minimum standards of existing model codes
- **Zoning Ordinances & Municipal Codes**
  - Promotes development and redevelopment patterns (location, type, density) that are at less risk from known hazards.
  - Reduces potential for damages caused by negligent or imprudent permitting or land use decisions
- **Subdivision Regulations**
  - Regulates the division of land parcels in ways that can help avoid or minimize the effects of known hazards.
  - Encourages or requires development applicants to submit plans or complete performance measures that identify the extent of known hazards, and mitigate their potential effects.
  - Ensures that new developments avoid land clearing or construction practices that may exacerbate known hazards.
  - Creates incentives for creative designs that avoid or minimize hazards.
- **Withhold Spending in Hazard Prone Areas.**



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## State Funding / Other Federal Funding

- **State Funding**
  - Community Development Block Grants
- **EPA State Revolving Funds (SRF)**
  - Drinking Water SRF
  - Clean Water SRF
  - Both provide low-interest loans to water systems for infrastructure improvements.
- **USDA**
  - Rural Development Grants
  - Emergency Watershed Protection Program
- **U.S. Dept of Commerce**
  - Public Works and Economic Dev. Facilities Assistance
- **U.S. Army Corps of Engineers**
  - Studies
  - Projects
  - Silver Jackets
- **Small Business Administration's (SBA) Office of Disaster Assistance**



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## Private Funding

- **Engage in Public-Private Partnership during Plan Development**
  - Private Associations & Foundations
  - Private Educational Institutions
  - Private Business Entities that provide services about hazards
  - Non-Governmental Organizations



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Thank you!

**Any Questions?**



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## PLAN REQUIREMENTS FOR EACH PARTICIPATING JURISDICTION

### WHO SHOULD PARTICIPATE IN THE PLAN?

MARC is preparing a Regional Hazard Mitigation Plan for 5 Missouri counties and jurisdictions within those counties – May 1, 2020 Deadline

Cities, counties, school districts, colleges, special districts may all participate

Elected and appointed officials, including those involved in emergency management, planning and zoning, public works and facility management, public information and communications, parks and recreation, emergency services

Designate a representative to serve on the Hazard Mitigation Planning Committee

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## PLAN REQUIREMENTS FOR EACH PARTICIPATING JURISDICTION

### WHAT IS REQUIRED IN AN ADOPTED PLAN?

Participation in the regional plan is important; local adoption is essential

- Provide data and help update risk assessment for hazards
- Provide data to describe current capabilities
- Identify specific mitigation actions for your jurisdiction
- Provide comments on plan draft
- Inform the public, local officials, and others about the planning process and provide opportunities for them to comment on the plan
- Formally adopt the mitigation plan

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## WHAT HAPPENS IF MY JURISDICTION CHOOSES NOT TO PARTICIPATE IN THE PLAN?

Jurisdictions will not be eligible applicants for FEMA Hazard Mitigation Assistance grants.


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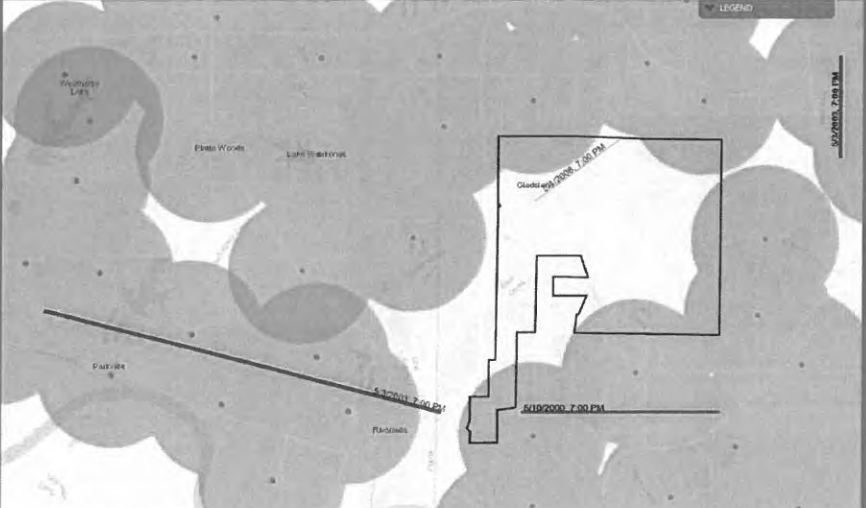
## BENEFITS OF PARTICIPATING IN A MULTI-JURISDICTIONAL PLAN

- Enables comprehensive approach to mitigate hazards that affect multiple jurisdictions
- Receives planning support and shares resources
- Avoids duplication of effort
- Improves coordination/communication among local jurisdictions

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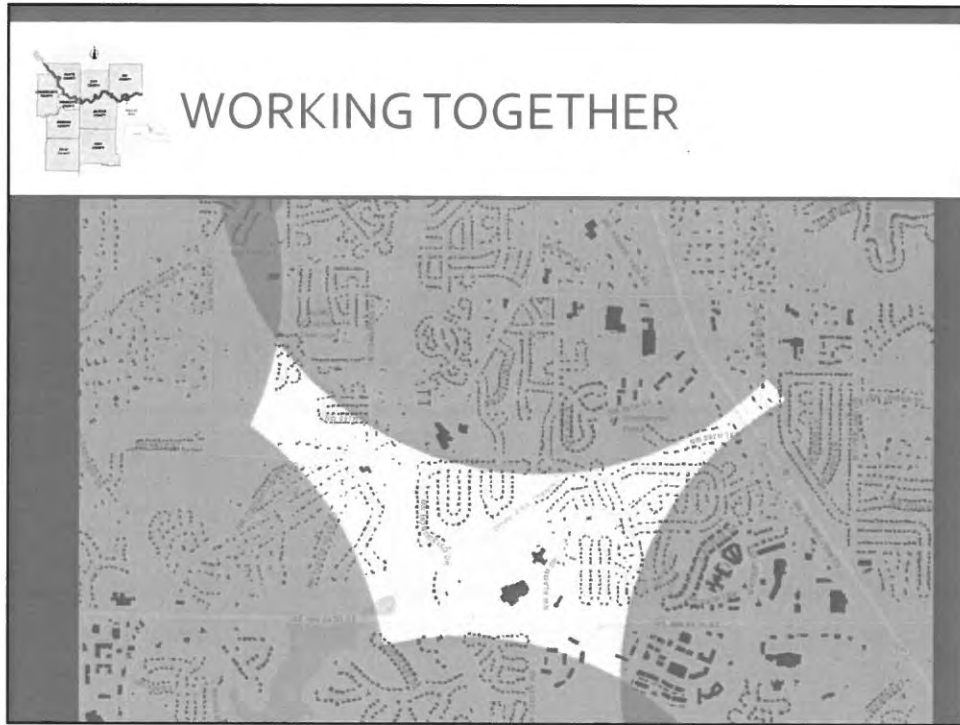


## WORKING TOGETHER

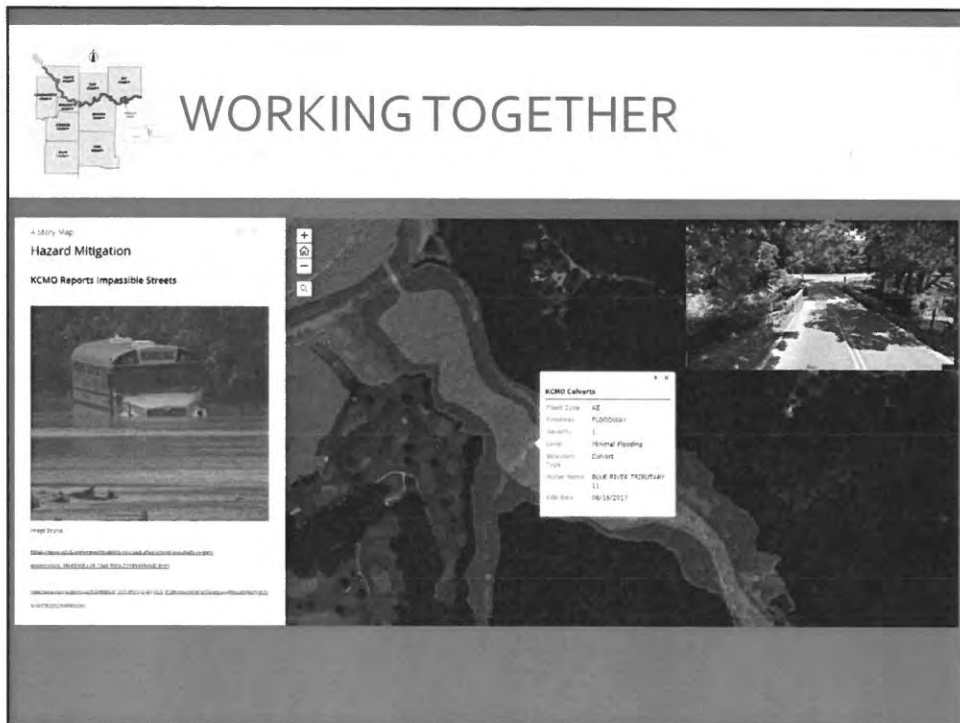


The map displays several overlapping jurisdictions. Labels include Platte Woods, Lake Washington, Fairview, and Ft. Collins. A legend is located in the top right corner. A scale bar on the right side indicates 5000 feet. A large, irregularly shaped area is outlined in black, representing a multi-jurisdictional plan area. This area includes parts of Platte Woods, Lake Washington, and Ft. Collins. A line labeled '5/18/2000 7:00 PM' runs diagonally across the map, and another line labeled '5/18/2000 7:00 PM' runs horizontally across the bottom right. A third line labeled '5/18/2000 7:00 PM' runs diagonally across the top right.

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### PRIORITIES - NATURAL HAZARDS (2014/2015 PLANS)


Kansas side of Metro		Missouri side of Metro	
Tornado	Terrorism/Agro-terrorism	Tornado	Mass Transportation Accidents
Flood	Extreme Temperatures	Severe Thunderstorms	Hazardous Materials
Winter Storm	Agricultural Infestation	Severe Winter Weather	Public Mass Shootings
Utility/Infrastructure Failure	Expansive Soils	Flooding	Civil Disorder
Drought	Dam and Levee Failure	Levee Failures	Cyber Disruption
Hazardous Materials	Radiological	Dam Failures	Terrorism
Lightning	Landslide	Heat Waves	
Wildfire	Soil Erosion and Dust	Wildland Fires	
Civil Disorder	Earthquake	Earthquakes	
Major Disease Outbreak	Land Subsidence	Emerging and Re-emerging Infectious Disease	
Hailstorm		Trans-boundary Animal Disease	

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### PRIORITIES - NATURAL HAZARDS FOR CONSIDERATION

- Flood-Related Hazards
  - River Flooding
  - Flash Flooding
- Severe Winter Weather
- Tornadoes/Severe Wind Storms
- Drought/Extreme Temperatures
- Severe Thunderstorms



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## HAZARD IDENTIFICATION AND RISK ASSESSMENT

- **Hazard Profile**
  - Hazard Description
  - Geographic Location
  - Severity/Magnitude/Extent
  - Previous Occurrences
  - Probability of Future Occurrence
  - Changing Future Conditions

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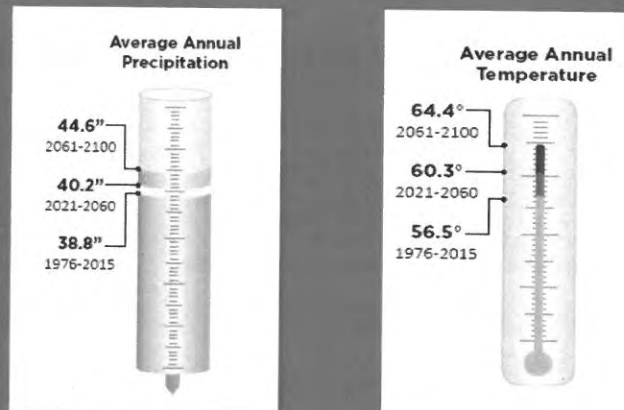


## HAZARD IDENTIFICATION AND RISK ASSESSMENT

- **Vulnerability Assessment**
  - Vulnerability Overview
  - Potential Losses to Existing Development
  - Previous & Future Development
  - Hazard Summary by Jurisdiction
- **Problem Statements**

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## KC Area Climate Projections



Source: Dan Walker, Ph.D. A.M. ASCE, Climate Moneys LLC, and Christopher Anderson, Ph.D., Iowa State University, [www.climatelook.com](http://www.climatelook.com)

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## TYPES OF STRATEGIES

- Public education and awareness
- Local plans and regulations
- Natural systems protection
- Structures and infrastructure

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## FLOODING (MAJOR AND FLASH)

### POSSIBLE STRATEGIES

- Comprehensive plan and floodplain management to regulate use of land
- Use incentives to focus development
- Adopt Community Rating System
- Adopt storm drainage regulations – hold water on property



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## FLOODING (MAJOR AND FLASH)

### POSSIBLE STRATEGIES

- Buyout of structures with repeated flood losses
- Design and construction of public infrastructure
- Green infrastructure improvements, green streets
- Warning systems



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## SEVERE WINTER WEATHER

- Adopt and enforce building codes
- Retrofitting public buildings
- Utility line standards regarding tree placement/pruning
- Burying utility lines underground
- Use snow fences and design roadways to address ice/snow
- Identify areas of vulnerable populations, how to communicate with them and assist as needed
- Install back up power for critical facilities

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## TORNADOES

- Construction of safe rooms – encourage or require in new construction - Adopt bldg codes
- Promote site design & bldg standards
- Public awareness activities, including drills
- Install storm sirens or use mobile applications to notify the public when taking shelter is necessary
- Identify and place signs on public shelter places/spaces

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## SEVERE THUNDERSTORMS

- **Conduct public awareness activities on how and where to take shelter, including drills**
- **Identify and place signs on public shelter places/spaces**
- **Maintain utility lines/tree pruning**

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## DROUGHT/EXTREME HEAT

- **Extreme temperatures will affect public health – public awareness for personal protection**
- **Identify and reach out to vulnerable populations**
- **Water saving techniques – public information, water use restrictions, guidance on landscape installation/maintenance**
- **Upgrade water systems and monitor water supply**
- **Prepare drought emergency plan**
- **Plant trees to mitigate urban heat island effect**

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## CRITICAL FACILITIES

- Critical Facility—essential in providing utility or direction either during the response to an emergency or during the recovery operation.
  - Essential Facility—if damaged would have devastating impacts on disaster response and/or recovery.
  - High Potential Loss Facility—if damaged would have a high loss or impact on the community.
  - Transportation/Lifeline Facility—assets critical for transport and provision of necessary utilities

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## CRITICAL FACILITY EXAMPLES

Essential Facilities	High Potential Loss Facilities	Transportation and Lifeline
<ul style="list-style-type: none"> <li>• Hospitals and other medical facilities</li> <li>• Police stations</li> <li>• Fire station</li> <li>• Emergency Operations Centers</li> </ul>	<ul style="list-style-type: none"> <li>• Power plants</li> <li>• Dams/levees</li> <li>• Military installations</li> <li>• Hazardous material sites</li> <li>• Schools</li> <li>• Shelters</li> <li>• Child care centers</li> <li>• Nursing homes</li> <li>• Main government buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Highways, bridges, and tunnels</li> <li>• Railroads and facilities</li> <li>• Bus facilities</li> <li>• Airports</li> <li>• Water treatment facilities</li> <li>• Natural gas facilities and pipelines</li> <li>• Oil facilities and pipelines</li> <li>• Communications facilities</li> </ul>

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## TABLE DISCUSSION ON ACTIONS LOCAL JURISDICTIONS CAN TAKE

- DISCUSS WHETHER THE LIST OF PRIORITY HAZARDS IS APPROPRIATE FOR THE NEW PLAN? ANYTHING THAT SHOULD BE DELETED? ANYTHING MISSING?
- CONSIDER POSSIBLE MITIGATION STRATEGIES THAT COULD BE MOST EFFECTIVE? WHAT SHOULD LOCAL JURISDICTIONS CONSIDER FOR IMPLEMENTATION? FOR POSSIBLE FEMA GRANTS?

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## CONTACTS

### Project Contacts:

John Davis, 816.701.8394 or  
jdavis@marc.org

Marlene Nagel, 816.701.8218 or  
mnagel@marc.org

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## We need YOU to help plan for reducing risks from natural disasters

Changes in climate conditions and the rising costs to repair public and private property makes it even more important to consider steps to reduce risks from natural disasters. Local governments, school districts and others prepare a hazard mitigation plan every 5 years to evaluate their risks and identify actions they may take to mitigate loss of life and property. Over the past year, the region has experienced increasing threats from flooding, severe winter storms, heat and drought and tornados.

As MARC begins our 2019 Hazard Mitigation planning process, it is important to include representatives from all aspects of public service — elected officials, planning and building services, emergency services, environmental planning, public health, public works and transportation, school district and college personnel and more.

For example, transportation is impacted in a natural disaster:

- Many communities have low water crossings in residential and commercial areas, prone to flooding from rising streams or flash flooding due to overloaded storm drainage systems
- Evacuation routes need to be identified to allow emergency response to take people to safety
- Air and freight networks bring supplies and support from other regions.
- Communication tools like KC Scout share important messages with the public.

This is why we hope to see elected officials, city administrators, emergency managers, public works directors, transportation planners — and you — at an event for developing and implementing a hazard mitigation and community resilience effort.

When: Tuesday, April 2, 2019

Where: Kauffman Foundation Conference Center, 4801 Rockhill Road, Kansas City, MO

[Map and directions](#)

The event is free to attend, but **registration is required**.

The keynote speaker is Linda Langston, director of strategic relations at the National Association of Counties (NACo), and former supervisor of Linn County, Iowa. Langston will discuss the importance of hazard mitigation planning and preparing for disasters, why local governments, schools and others should care, and how to approach the planning process with a holistic view.

Workshop topics:

- What are the hazard mitigation requirements for local plans?
- Do all jurisdictions face the same challenges?
- Have the challenges changed over the past five years?
- How are risks changing with climate change or other conditions?
- What actions have local governments taken to mitigate hazards and what results did they achieve?
- Which strategies have proven most effective in mitigating hazards?



**Regional Hazard Mitigation Plan Advisory Committee  
Friday, June 21, 2019, at 1:30 pm at the MARC offices**

**AGENDA**

1. Introductions
2. Priority Hazards from April 2 Kickoff Event
3. Data Collection/Surveys of Each Local Jurisdiction
4. Mapping/Analysis Underway
5. Next Steps
  - a. Survey out to each jurisdiction
  - b. Schedule first series of meetings
  - c. Complete update of regional profile and risk and vulnerability sections

## **PRIORITY HAZARDS FOR 2019 REGIONAL HAZARD MITIGATION PLAN**

- 1. Tornadoes**
- 2. Severe Thunderstorms**
- 3. Floods**
  - a. Flash Floods
  - b. Riverine Floods
  - c. Levee Failures
  - d. Dam Failures
- 4. Severe Winter Weather**
- 5. Heat**
  - a. Drought
  - b. Heat Waves

## **Regional Hazard Mitigation Plan Advisory Committee Friday, June 21, 2019, at 1:30 pm at the MARC offices**

### Those Present

David Pavlich, Kearney

Justin Sorg, FEMA

Will Akin, Clay County Sheriff/Emergency Manager

Jay Heermann, Marlene Nagel, Aspen Walters, MARC

### **AGENDA**

1. Introductions – Ms. Nagel welcomed everyone and indicated that illness and other meetings prevented the co-chairs from attending, and she asked for self-introductions.
2. Priority Hazards from April 2 Kickoff Event – Ms. Nagel reviewed the priority hazards that came out of the April 2 kickoff - Tornadoes, Floods (flash and riverine, dam and levee failures), Severe Winter Weather, Severe Thunderstorms (including lightning), and Heat/Drought. Committee members mentioned events over the past five years – Weston’s sewage treatment plant flooded; Hardin cemetery flooded; Levasy levee breached; Mosby need for flood buyout; Missouri River concern of repeat of 1993 flood; Smithville road washed away. Discussion about Wildfires, and committee members cited low density of rural-urban interface and few incidents made it a lower priority. It was suggested that the plan analysis move away from a rating scale and evaluate what the risk is to the communities included in the plan and the experience of vulnerable people and structures. The five priority hazards were cited as ones with greatest risk. Mr. Sorg reported that the region does not need to do the mathematical calculations that were included in the 2015 plan.
3. Data Collection/Surveys of Each Local Jurisdiction – Ms. Nagel and Mr. Heermann reported on the new data collection tools to enable jurisdictions to update their 2015 capabilities assessment information and plans for a mapping tool to provide resources for ongoing hazard mitigation planning. Mr. Sorg responded that the tools will be helpful for monitoring mitigation actions over time. Mr. Akins responded that the tools could help jurisdictions with updated information every two years and will encourage local participation in the plan.
4. Mapping/Analysis Underway – Mr. Heermann reported that the mapping tool is being developed and information collected. MARC data layers will be maintained, and he is hopeful that the tool will help local officials identify additional information that would be helpful to collect, such as low water crossings along major roadways or a comprehensive inventory of storm siren locations.
5. Next Steps

- a. Survey out to each jurisdiction – Ms. Nagel reported that the survey tool will go out to every jurisdiction in the 5 county area, including those that did not participate in the 2015 plan by late July/early August.
- b. Schedule first series of meetings – Ms. Nagel expects to schedule a first round of public meetings in early September and a second round in December.
- c. Complete update of regional profile and risk and vulnerability sections – Ms. Nagel hopes to complete the update of the Planning Area profile by the end of August as well as the risk and vulnerability sections. Aspen Walters, an intern with MARC, has supported the work on the updates of those sections.

There being no further business, the meeting was adjourned.



## **PRIORITY HAZARDS FOR 2019 REGIONAL HAZARD MITIGATION PLAN**

- 1. Tornadoes**
- 2. Severe Thunderstorms**
- 3. Floods**
  - a. Flash Floods
  - b. Riverine Floods
  - c. Levee Failures
  - d. Dam Failures
- 4. Severe Winter Weather**
- 5. Heat**
  - a. Drought
  - b. Heat Waves



**REGIONAL HAZARD MITIGATION PLAN ADVISORY COMMITTEE  
JUNE 21, 2019**

Name	Organization	Phone	E-mail
David Paulich	Kearney	816-903-4731	dnpaulich@kearney.com
WILL AKEN	CLAY COUNTY SO/EM	816-407-3730	waken@shermidelayco.com
Justin Sorg	FEMA		
Jay Heetmann	MARC		
Marlene Nagel	MARC		
Aspen Walters	MARC		



# Regional Hazard Mitigation Plan Advisory Committee

## Friday, June 21, 2019, at 1:30 pm at the MARC offices

### Those Present

David Pavlich, Kearney

Justin Sorg, FEMA

Will Akin, Clay County Sheriff/Emergency Manager

Jay Heermann, Marlene Nagel, Aspen Walters, MARC

### **AGENDA**

1. Introductions – Ms. Nagel welcomed everyone and indicated that illness and other meetings prevented the co-chairs from attending, and she asked for self-introductions.
2. Priority Hazards from April 2 Kickoff Event – Ms. Nagel reviewed the priority hazards that came out of the April 2 kickoff - Tornadoes, Floods (flash and riverine, dam and levee failures), Severe Winter Weather, Severe Thunderstorms (including lightning), and Heat/Drought. Committee members mentioned events over the past five years – Weston’s sewage treatment plant flooded; Hardin cemetery flooded; Levasy levee breached; Mosby need for flood buyout; Missouri River concern of repeat of 1993 flood; Smithville road washed away. Discussion about Wildfires, and committee members cited low density of rural-urban interface and few incidents made it a lower priority. It was suggested that the plan analysis move away from a rating scale and evaluate what the risk is to the communities included in the plan and the experience of vulnerable people and structures. The five priority hazards were cited as ones with greatest risk. Mr. Sorg reported that the region does not need to do the mathematical calculations that were included in the 2015 plan.
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- a. Survey out to each jurisdiction – Ms. Nagel reported that the survey tool will go out to every jurisdiction in the 5 county area, including those that did not participate in the 2015 plan by late July/early August.
- b. Schedule first series of meetings – Ms. Nagel expects to schedule a first round of public meetings in early September and a second round in December.
- c. Complete update of regional profile and risk and vulnerability sections – Ms. Nagel hopes to complete the update of the Planning Area profile by the end of August as well as the risk and vulnerability sections. Aspen Walters, an intern with MARC, has supported the work on the updates of those sections.

There being no further business, the meeting was adjourned.



## REGIONAL HAZARD MITIGATION PLAN MEETING STEERING COMMITTEE – JANUARY 9, 2020

### AGENDA

1. Welcome/introductions
2. Status on Planning Process
  - a. Who is participating?
  - b. Additional information needed from local jurisdictions
  - c. What's next
3. Plan Sections – What more is needed?
  - a. Planning Process
  - b. Capability Assessment Update
  - c. Goals and Actions (progress from 2015; new)
4. Timeframe to complete the plan and seek approval
  - a. Review of draft plan – submit to SEMA by February 15, 2020
  - b. Request for public outreach
  - c. Adoption by May 1, 2020
5. Other Business







**Hazard Mitigation Plan Steering Meeting**  
**Thursday, January 9, 2020**

<b>Initial if Present</b>	<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Email</b>	<b>Phone</b>

## REGIONAL HAZARD MITIGATION PLAN MEETING STEERING COMMITTEE – JANUARY 9, 2020 Meeting Summary

### Those Present

Anthony Avery, Platte County  
Michael O’Neal, Platte County  
Justin Crane, Cass County  
Will Akin, Clay County  
Dante Gliniecki, Independence  
David Pavlich, Kearney  
Mike Harris, MERC SEMA  
Jim Connelly, KCMO  
Carl Harper, Ray County  
Justin Sorg, FEMA  
Marlene Nagel, MARC

1. Welcome/introductions – Marlene welcomed those present and asked for introductions.
2. Status on Planning Process
  - a. Who is participating? – Marlene reported on the jurisdictions that are participating and it was suggested that MARC reach out to several school districts who had not indicated their interest, including Kearney School District. At the current time, there were five counties, 20 school districts, 24 cities and four fire protection districts. Marlene agreed to try to encourage additional participants and to get those that participated in 2015 to update their information.
  - b. Additional information needed from local jurisdictions – Marlene reported that a number of jurisdictions had still not provided updates to their capabilities assessment and to their goals/actions.
3. What’s next – Further contact with jurisdictions will be made to explain the importance of participating and what action is needed
4. Plan Sections – What more is needed?
  - a. Planning Process – Four meetings (Cass, Ray, Jackson and Platte) were held on December. Due to weather, the Clay County meeting was cancelled and was recently held in January. MARC needs to document any local meetings held.
  - b. Capability Assessment Update – Still working to get updated information from some communities.
  - c. Goals and Actions (progress from 2015; new) – Still seeking information from some jurisdictions
5. Timeframe to complete the plan and seek approval
  - a. Review of draft plan – submit to SEMA by February 15, 2020 – Marlene indicated plans to try to submit the draft plan before the end of February. SEMA agreed to a 30 day extension.

b. Request for public outreach – MARC posted social media to encourage public feedback and asked for feedback on its website. KCMO planned a public meeting.

c. Adoption by May 1, 2020 – the plan is to submit a final plan to SEMA and FEMA by May 1. Local adoption is required.

6. Other Business

**METROPOLITAN EMERGENCY MANAGERS COMMITTEE  
 UPDATE ON REGIONAL HAZARD MITIGATION PLAN – July 2019**

Deadline to submit final plan with local jurisdictions’ adoption is **May 1, 2020**

Will schedule two rounds of county-level public meetings – first round begins in early September; second round will be late November or early December

- Plan will cover 5 Missouri counties, cities, school districts and other special districts desiring to participate
- Have communicated with all local jurisdictions that participated in the 2015 plan, and sent information earlier this year on the mitigation strategies in the adopted plan to receive updates on actions taken. Follow-up with local jurisdictions is underway.
- Held a kick off meeting on April 2 attended by over 80 local officials, and confirmed that the 2019 plan will focus on five priority natural hazards – flooding (riverine and flash flooding; dam and levee failures); heat and drought; severe winter weather; severe thunderstorms; and tornadoes.
- Preparing analysis of changing climate on severity of priority hazards
- Completing update of plan sections – Regional Profile and Hazards Profiles

Developing an online mapping tool for local jurisdictions to use in evaluating the risk and vulnerability of each of the 5 priority hazards. Data sets are being assembled, including:

Flooding

Events over past 5 years	Value of Parcels in Flood Zone
100-year floodplain	Vulnerable Populations
Critical facilities	Dams
Bridges	Levees

Tornadoes

Events over past 5 years, including path	Vulnerable Populations
Location and radius of sirens	Critical facilities
Shelters for public use	Value of Parcels

Severe Winter Weather

Events over past 5 years	Tree canopy
Warming centers	Overhead power lines
Vulnerable Populations	

Drought/Heat

Events over past 5 years	Vulnerable Populations
Critical facilities	

Severe Thunderstorms

Events over past 5 years	Tree canopy
Critical facilities	Overhead power lines
Vulnerable Populations	



## LOCAL JURISDICTIONS IN 2015 HAZARD MITIGATION PLAN

### Cass County\*

Belton\*  
Harrisonville\*  
Lake Winnebago\*  
Peculiar\*  
Pleasant Hill\*

Raymore\*  
Archie R-V School District\*  
Harrisonville School District\*<sub>1</sub>  
Pleasant Hill R-III School District\*  
Raymore-Peculiar School District

### Clay County\*

Excelsior Springs  
Gladstone\*  
Kearney\*  
Liberty\*  
Mosby\*

North Kansas City\*  
Smithville\*  
Fishing River Fire Protection District  
North Kansas City School District  
Smithville R-1 School District\*

### Jackson County\*

Blue Springs\*  
Grandview\*  
Independence\*  
Kansas City, Mo.\*  
Lee's Summit  
Oak Grove\*  
Raytown\*  
Sni Valley Fire Protection District\*  
Blue Springs School District\*

Fort Osage R-1 School District\*  
Independence School District  
Kansas City School District  
Lee's Summit School District  
Oak Grove R-VI School District\*<sub>1</sub>  
Metropolitan Community Colleges\*  
Kansas City University of Medicine &  
Biosciences<sub>1</sub>

### Platte County\*

Edgerton  
Farley  
Ferrelview  
Houston Lake\*  
Lake Waukomis  
Northmoor\*  
Parkville\*  
Platte City\*  
Platte Woods  
Riverside\*

Tracy\*<sub>1</sub>  
Weatherby Lake\*  
Weston\*  
Northland Regional Ambulance District  
West Platte Fire Protection District  
North Platte R-1 School District\*  
Park Hill School District\*  
Platte County R-3 School District  
West Platte R-II School District\*  
Park University

### Ray County\*

Richmond

\*Denotes 2010 Participants







Kansas City Regional

# Hazard Mitigation Plan

## Meetings on the new regional hazard mitigation effort scheduled for September

### Please join us and offer your feedback!

The Mid-America Regional Council (MARC) is inviting elected officials, emergency managers, public works directors, planners, other community representatives and the public to attend one of five upcoming meetings on the Regional Hazard Mitigation Plan. The two-hour meetings, scheduled from September 4–12, 2019, will allow attendees to learn more about the plan, update information about their local jurisdiction's profile, find out how to become a participant if their city or school district didn't adopt a plan in 2015 and discuss mitigation measures jurisdictions might consider implementing over the next five years.

The meetings will also give attendees the opportunity to review data available through a new online tool created by MARC to assist in the planning process and to hear about FEMA grants that could help participating jurisdictions implement specific mitigation actions.

### Key focus areas:

The new plan will focus on five priority natural hazards:

- Floods – flash and riverine floods, dam and levee failures
- Tornadoes
- Severe thunderstorms
- Heat and drought
- Severe winter weather

### ***Special accommodations and to RSVP»***

To RSVP for an upcoming meeting or if you require special accommodations to participate, please contact Marlene Nagel at 816-701-8218 or [mnagel@marc.org](mailto:mnagel@marc.org) at least 48 hours in advance.

### Meeting Dates:

#### **Cass County**

Wednesday, Sept. 11, 1–3 p.m.  
Raymore Riverview Community  
Center 227 Municipal Circle  
Raymore, Missouri

#### **Clay County**

Thursday, Sept. 12, 1–3 pm  
Gladstone Community Center  
6901 N. Holmes Street  
Gladstone, Missouri

#### **Jackson County**

Tuesday, Sept. 10, 1–3 p.m.  
Independence Truman  
Memorial Building  
416 W. Maple  
Independence, Missouri

#### **Platte County**

Friday, September 6, 9–11 a.m.  
Platte County Resource Center  
11724 N.W. Plaza Circle  
Kansas City, Missouri

#### **Ray County**

Wednesday, Sept. 4, 2–4 pm  
Eagleton Civic Center  
1015 W Royle Street  
Richmond, Missouri

### Who Should Attend:

Elected officials, emergency managers, public works directors, planners, school personnel and the public are encouraged to attend.



Regional Hazard Mitigation Plan Social Media Promotion

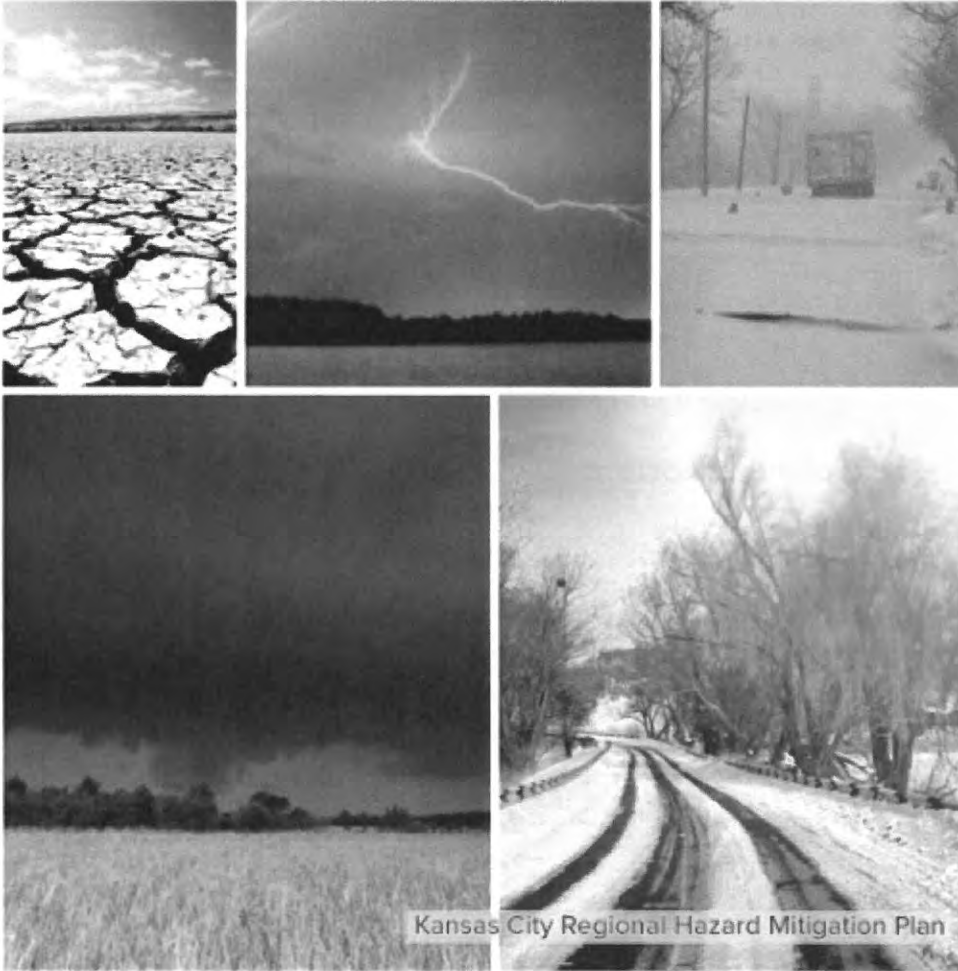
<b>Facebook</b>	<b>Date</b>	<b>Budgeted cost</b>	<b>Amt. Spent</b>
Ray County	Aug. 30-Sept 4	\$20	\$15.58
Platte County	Sept. 1-6	\$50	\$50.00
Jackson County	Sept. 4-10	\$50	\$50.04
Cass County	Sept. 6-11	\$50	\$50.00
Clay County	Sept. 7-12	\$50	\$50.07
<b>Total:</b>		<b>\$220</b>	<b>\$215.69</b>

**Hazard Mitigation Facebook Promotions**

	<b>Date</b>	<b>Imp.</b>	<b>Eng.</b>	<b>Clicks</b>	<b>CTR</b>	<b>Results (Reach)</b>	<b>Results Rate</b>	<b>Cost</b>	<b>CPM</b>
Ray	8/30-9/4	5,767	8	8	0.14%	5,762	99.91%	\$15.58	\$2.70
Platte (Video)	9/1-9/6	19,661	1,569	11	0.06%	10,074	51.24%	\$50	\$2.54
Jackson	9/4-9/10	25,832	30	29	0.11%	12,113	46.89%	\$50	\$1.94
Cass	9/6-9/11	18,138	28	23	0.13%	8,425	46.45%	\$50	\$2.76
Clay (video)	9/7-9/12	23,203	2,060	9	0.04%	13,035	56.18%	\$50	\$2.16
<b>Total</b>		<b>92,601</b>	<b>3,695</b>	<b>80</b>	<b>0.09%</b>	<b>49,409</b>	<b>53.36%</b>	<b>\$215.58</b>	<b>\$2.33</b>

**MARC** Mid-America Regional Council  
Sponsored · 

Please join us and provide feedback on the Kansas City Regional Hazard Mitigation Plan, which addresses reducing risks from natural and man-made hazards and identifying and gaining policy support for mitigation actions.



WED, SEP 4

### Ray County Regional Hazard Mitigation

Eagleton Civic Center · Richmond

2 people interested

★ Interested

**MARC** Mid-America Regional Council  
Sponsored 

Please join us and provide feedback on the Kansas City Regional Hazard Mitigation Plan, which addresses reducing risks from natural and man-made hazards and identifying and gaining policy support for mitigation actions.



[WWW.FACEBOOK.COM](http://WWW.FACEBOOK.COM)

### **Platte County Regional Hazard Mitigation**

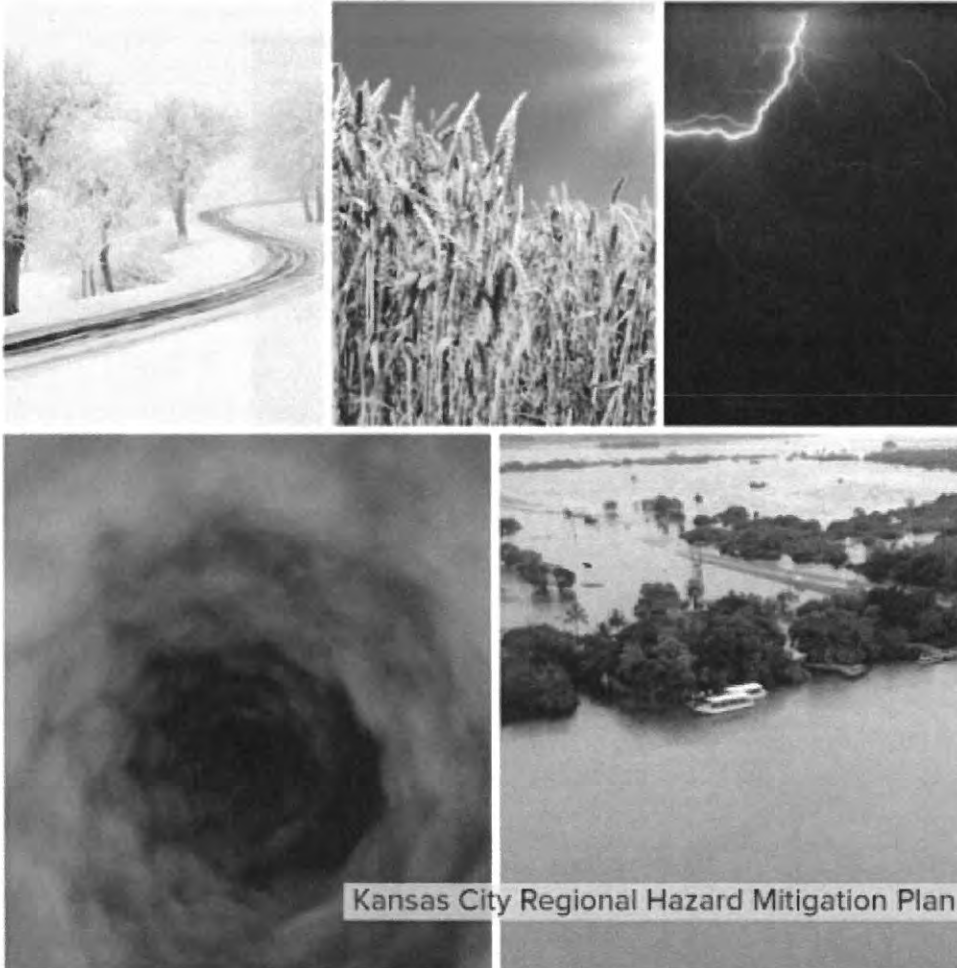
Sept. 6, 9-11 a.m. Platte County Resource Center

[Learn More](#)

**MARC Mid-America Regional Council**

Sponsored 

Please join us and provide feedback on the Kansas City Regional Hazard Mitigation Plan, which addresses reducing risks from natural and man-made hazards and identifying and gaining policy support for mitigation actions.



TUE, SEP 10

**Jackson County Regional Hazard Mitigation**

Truman Memorial Building · Independence

★ Interested

**MARC Mid-America Regional Council**

Sponsored 

Please join us and provide feedback on the Kansas City Regional Hazard Mitigation Plan, which addresses reducing risks from natural and man-made hazards and identifying and gaining policy support for mitigation actions.



WED, SEP 11

**Cass County Regional Hazard Mitigation**

Centerview Community Center, 227 Municipal Circle, ...

2 people interested · 1 person going

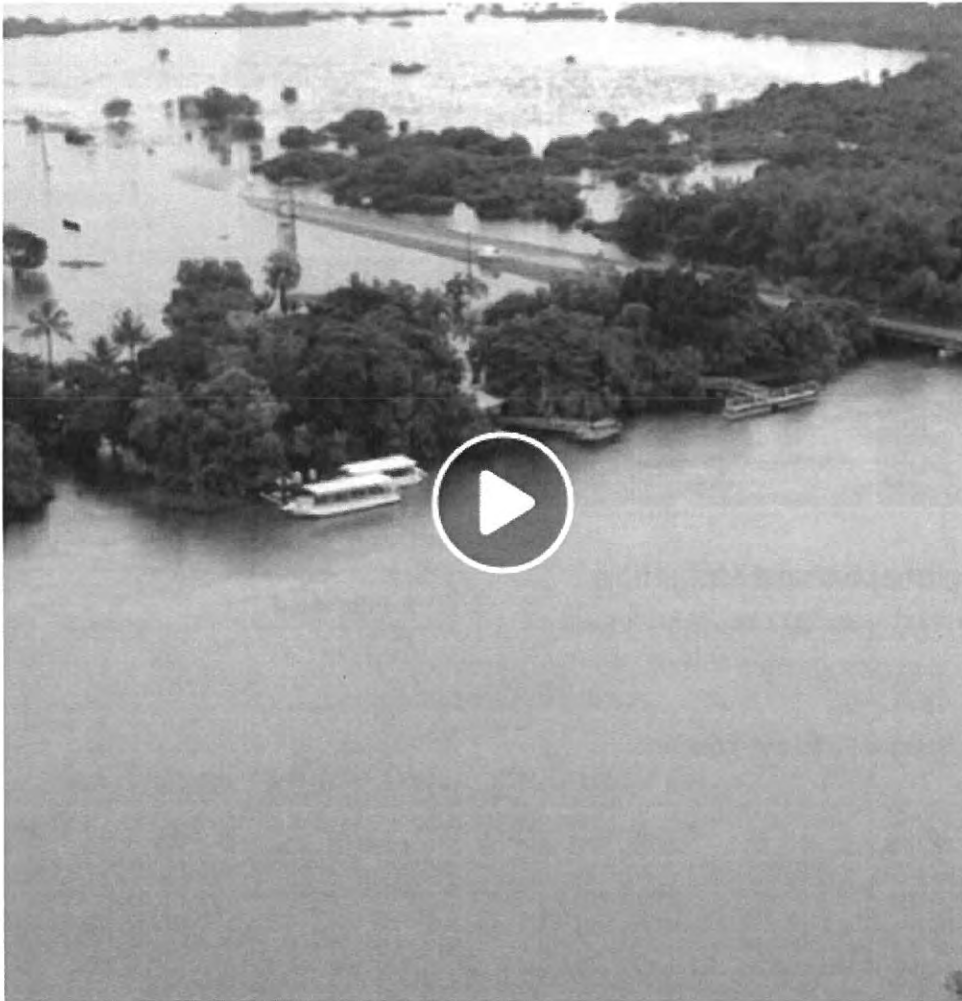
★ Interested

 Nancy Baalman, Kenneth Eisen and 3 others

**MARC Mid-America Regional Council**

Sponsored - 

Please join us and provide feedback on the Kansas City Regional Hazard Mitigation Plan, which addresses reducing risks from natural and man-made hazards and identifying and gaining policy support for mitigation actions.



[WWW.FACEBOOK.COM](http://WWW.FACEBOOK.COM)

### **Clay County Hazard Mitigation Plan**

Sept. 12, 1-3 p.m. Gladstone Community Center

[Learn More](#)





*Kansas City Regional*

# **Hazard Mitigation Plan**

## **REGIONAL HAZARD MITIGATION PLAN**

### **CASS COUNTY MEETING**

**Wednesday, September 11, 2019**

**1 pm – 3 pm**

**Raymore Riverview Community Center**



**227 Municipal Circle, Raymore, MO**

## **AGENDA**

1. Welcome/introductions
2. Background/Purpose and Value of the Hazard Mitigation Plan
3. Elements of the plan – risk profiles, local jurisdictions' profile and goals/strategies. Local jurisdiction and school profile
4. Goals/strategies – what are the considerations to identifying these and what are some that are more commonly considered by cities and counties, school districts and colleges, other special districts
5. Mapping/Data Tool
6. Next steps in our process
7. Questions/Discussion



**KC Regional Hazard Mitigation Plan Meeting - Cass County, Missouri**  
**Wednesday, September 11, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Alig	Josh	Pleasant Hill	PW and CD Director		jialig@pleasanthill.com
	Arnone	Larry	Strasburg C3 School District	Superintendent	816-680-3333	larnone@strasburg.k12.mo.us
	Barton	Alexa	Belton	City Administrator	816-331-4331	abarton@belton.org
	Besermin	Steve	Lake Winnebago	Public Works		lwpubworks@comcast.net
	Blackburn	David	City of Archie	City Administrator	816-293-5601	Cityadmin@cityofarchie.org
	Brinkley	John	East Lynne 40 School District	Superintendent/Principal	816-626-3511	jbrinkley@elynn.k12.mo.us
	Brooks	Carl	Peculiar	Engineer		cbrooks@cityofpeculiar.com
	Brown	Bill	CASS COUNTY	Economic Development		billbrowspectrum@gmail.com
	Cadoret	Jim	Raymore	Community Development Dir	816-892-3030	jcadoret@raymore.com
	Clements	David	Belton	Planning & Building Director	816-331-4331	dclements@belton.org
	Crane	Justin	CASS COUNTY	Emerg. Mgr.	816-380-8584	emergency.management@cassmosheriff.org
	Donahoe	Michele	Raymore-Peculiar School District	PIO		mdonahoe@raypect.k12.mo.us
	Driscoll	Robert	Pleasant Hill	Police Chief		rdriscoll@pleasanthill.com
	Duran	Celia	Belton	Public Works Director	816-331-4331	cduran@belton.org
	Feuerborn	Jim	Raymore	City Administrator		jfeuerborn@raymore.com
	Filer	Jill	Harrisonville School District	PIO		jill.filer@harrisonvilleschools.org
	Francis	Larry	Harrisonville	Emerg. Services Director	816-380-8925	lfrancis@ci.harrisonville.mo.us
	Fransse	Bill	Western Cass Fire	Fire Chief	816-618-3998	brfranse@wc-fed.org
	Gooch	Nicholas	Grain Valley School District	Assistant Superintendent	(816) 847-5006	ngooch@gvr5.net
	Gress	David	Raymore	Planner		dgress@raymore.com
	Grolebe	Jack	East Lynn Gunn City Fire	Fire Chief	816-869-3840	jgrolebe@cgcfire@hotmail.com
	Gurin	Harry	Peculiar	Police Chief	816-779-5102	hgurin@peculiarpd.org
	Hondrick	Jason	Dolan West Dolan Fire	Fire Chief	816-899-2550	dwd@mokancomm.net



**KC Regional Hazard Mitigation Plan Meeting - Cass County, Missouri**  
**Wednesday, September 11, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Hubbard	Kim	Garden City	City Clerk	816-862-8208	khubbard@fairpoint.net
	Kagarice	Chuck	Creighton Fire	Fire Chief	816-547-8072	ckcfd@yahoo.com
	Kramer	Jeff	Archie School District	Superintendent	816-293-5312	jkramer@archie.k.12.mo.us
	Krass	Mike	Raymore	Public Works Director	816-331-1852	mkrass@raymore.com
	Kroh	Roger	Harrisonville	CD Director		rkroh@ci.harrisonville.mo.us
	Larkey	Norman	Belton	Fire Chief/EM	816-331-7969	nlarkey@beltonfire.org
	Little	Wayne	Loch Lloyd	City Clerk	816-322-8198	littlwaynea@hotmail.com
	Long	Steve	Pleasant Hill Fire	Fire Chief / Emergency Mgr	816-540-9108	slong@phfr.net
	Lopez	Mark	Garden City Fire	Fire Chief	816-862-6366	gardencityfire1900@gmail.com
	Martinez	Sharon	Creighton	City Administrator/City Clerk	816-499-2210	creighton.cityclerk@gmail.com
	Mayfield	Terry	Drexel	Mayor	816-619-2323	cityofdrexel@gmail.com
	Mayfield	Terry	Drexel School District	Superintendent	816-657-4715	tmayfield@drexelbobcats.net
	McConnell	Melissa	Belton #124 School District	PIO		mmcconnell@bsd124.org
	McDonald	Cliff	Peculiar	City Planner		cmcdonald@cityofpeculiar.com
	McKee	Jeff	Cleveland	Mayor	816-618-3412	cleveland1@fairpoint.net
	Meins	Dillard	CASS COUNTY	Cass County Road and Bridge Superintendent	816-380-8360	dillardm@casscounty.com
	Mensing	Paul	Harrisonville School District	Superintendent	816-380-2727	paul.mensing@harrisonvilleschools.org
	Meyers	Steven	Pleasant Hill School District	Superintendent	816-540-3161	smeyers@pleasanthillschools.com
	Monsees	Kari	Raymore-Peculiar School District	Superintendent	816-892-1300	kari.monsees@raypec.org
	Murdock	Ryan	Raymore	Emerg. Mgr.	816-892-3032	rmurdock@raymore.com
	Myers	Gordon	Midway School District	Superintendent	816-250-2994	gmyers@midwayk12.net
	Myler	Eric	Harrisonville	Fire Chief / Emergency Mgr	816-380-8925	emyler@ci.harrisonville.mo.us
	Nagel	Marlene	Mid-America Regional Council	Director Community Development	816-701-8218	mmagel@marc.org

KC Regional Hazard Mitigation Plan Meeting - Cass County, Missouri  
 Wednesday, September 11, 2019

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Newkirk	Sue	City of Archie	City Clerk	816-293-5601	cityofarchie@hotmail.com
	Odom	Jimmy	CASS COUNTY	Cass County Commissioner		jimmyo@casscounty.com
	Patterson	Eric	Harrisonville	Public Works Director	816-380-8964	epatterson@ci.harrisonville.mo.us
	Person	James	Belton	Police Chief	816-331-5522	jpersion@beltonpd.org
	Ratliff	Brad	Peculiar	City Administrator		bratliff@cityofpeculiar.com
	Ritter	Dr Steve	Sherwood-Cass School District	Superintendent	660-499-2239	sritter@sherwoodk12.net
	Sebree	Jimmy	Central Cass Co. Fire Protection District	Fire Chief	816-380-6744	cccfd@embarqmail.com
	Smith	Kenneth	Lake Winnebago	Emerg. Mgr.	816-582-6091	hogheadpc@comcast.net
	Stevens	Lee	South Metro Fire Protection District	Fire Chief	816-331-3008	lstevens@southmetrofire.org
	Strange	Bob	Drexel Fire	Fire Chief	816-382-5523	drexelfire1801@gmail.com
	Teufel	Shelby	Pleasant Hill	City Admin.	816-540-3135	shelbyt@pleasanthill.com
	Traey	Lambertz	CASS COUNTY	Cass County Building and Zoning Dir	816-380-8134	TraeyL@CassCounty.com
	Underwood	Andrew	Belton #124 School District	Superintendent	816-489-7000	aunderwood@bsd124.org
	Welch	Happy	Harrisonville	City Administrator	816-380-8919	hwelch@ci.harrisonville.mo.us
	Zimmerman	Jan	Raymore	Police Chief		jzimmerman@raymore.com
✓	ARTHUR	CHRIS	HARRISONVILLE	BUILDING OFFICIAL	816-380-8958	carthure@harrisonville.com
JE	Eggers	Jason	Harrisonville Schools	Assist. Supt.	816-380-2727	jason.eggers@harrisonville.schools.mo.us
SP	Johnson	Scott	Ray-Mo Schools	Winters of Frontier	816-935-1373	Scott.Johnson@RayMo.org
PD	Hefterngal	BRYAN	Ray-Pec Schools	Asst. Supt	816-892-1317	bryan.hefterngal@raypecschools.org
PP	Poisel	Bob	Belton School District	Asst. Spt	816-719-5947	bpoisel@beltonschools.org

**KC Regional Hazard Mitigation Plan Meeting - Cass County, Missouri  
Wednesday, September 11, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Alig	Josh	Pleasant Hill	PW and CD Director		j.alig@pleasanthill.com
	Arnone	Larry	Strasburg C3 School District	Superintendent	816-680-3333	larnone@strasburg.k12.mo.us
	Barton	Alexa	Belton	City Administrator	816-331-4331	abarton@belton.org
	Besermin	Steve	Lake Winnebago	Public Works		lwpubworks@comcast.net
	Blackburn	David	City of Archie	City Administrator	816-293-5601	Cityadmin@cityofarchie.org
	Brinkley	John	East Lynne 40 School District	Superintendent/Principal	816-626-3511	jbrinkley@elynn.k12.mo.us
	Brooks	Carl	Peculiar	Engineer		cbrooks@cityofpeculiar.com
	Brown	Bill	CASS COUNTY	Economic Development		billbrownspectrum@gmail.com
	Cadoret	Jim	Raymore	Community Development Dir	816-892-3030	jcadoret@raymore.com
	Clements	David	Belton	Planning & Building Director	816-331-4331	dclements@belton.org
	Crane	Justin	CASS COUNTY	Emerg. Mgr.	816-380-8584	emergency.management@cassmosheriff.org
	Donahoe	Michele	Raymore-Peculiar School District	PIO		mdonahoe@raypect.k12.mo.us
	Driscoll	Robert	Pleasant Hill	Police Chief		rdriscoll@pleasanthill.com
	Duran	Celia	Belton	Public Works Director	816-331-4331	cduran@belton.org
	Feuerborn	Jim	Raymore	City Administrator		jfeuerborn@raymore.com
	Filer	Jill	Harrisonville School District	PIO		jill.filer@harrisonvilleschools.org
	Francis	Larry	Harrisonville	Emerg. Services Director	816-380-8925	lfrancis@ci.harrisonville.mo.us
	Franse	Bill	Western Cass Fire	Fire Chief	816-618-3998	brfranse@wc-fed.org
	Gooch	Nicholas	Grain Valley School District	Assistant Superintendent	(816) 847-5006	ngooch@gv5.net
	Gress	David	Raymore	Planner		dgress@raymore.com
	Grolebe	Jack	East Lynn Gunn City Fire	Fire Chief	816-869-3840	jgrolebe@cgfire@hotmail.com
	Gurin	Harry	Peculiar	Police Chief	816-779-5102	hgurin@peculiarpd.org
	Hondrick	Jason	Dolan West Dolan Fire	Fire Chief	816-899-2550	dwd@mokancomm.net




**KC Regional Hazard Mitigation Plan Meeting - Cass County, Missouri**  
**Wednesday, September 11, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Hubbard	Kim	Garden City	City Clerk	816-862-8208	khubbard@fairpoint.net
	Kagarice	Chuck	Creighton Fire	Fire Chief	816-547-8072	ckcfd@yahoo.com
	Kramer	Jeff	Archie School District	Superintendent	816-293-5312	jkramer@archie.k.12.mo.us
	Krass	Mike	Raymore	Public Works Director	816-331-1852	mkrass@raymore.com
	Kroh	Roger	Harrisonville	CD Director		rkroh@ci.harrisonville.mo.us
	Larkey	Norman	Belton	Fire Chief/EM	816-331-7969	nlarkey@beltonfire.org
	Little	Wayne	Loch Lloyd	City Clerk	816-322-8198	littlwaynea@hotmail.com
	Long	Steve	Pleasant Hill Fire	Fire Chief / Emergency Mgr	816-540-9108	slong@phfr.net
	Lopez	Mark	Garden City Fire	Fire Chief	816-862-6366	gardencityfire1900@gmail.com
	Martinez	Sharon	Creighton	City Administrator/City Clerk	816-499-2210	creighton.cityclerk@gmail.com
	Mayfield	Terry	Drexel	Mayor	816-619-2323	cityofdrexel@gmail.com
	Mayfield	Terry	Drexel School District	Superintendent	816-657-4715	tmayfield@drexelbobcats.net
	McConnell	Melissa	Belton #124 School District	PIO		mmcconnell@bsd124.org
	McDonald	Cliff	Peculiar	City Planner		cmcdonald@cityofpeculiar.com
	McKee	Jeff	Cleveland	Mayor	816-618-3412	cleveland1@fairpoint.net
	Meins	Dillard	CASS COUNTY	Cass County Road and Bridge Superintendent	816-380-8360	dillardm@casscounty.com
	Mensching	Paul	Harrisonville School District	Superintendent	816-380-2727	paul.mensching@harrisonvilleschools.org
	Meyers	Steven	Pleasant Hill School District	Superintendent	816-540-3161	smeyers@pleasanthillschools.com
	Monsees	Kari	Raymore-Peculiar School District	Superintendent	816-892-1300	kari.monsees@raypec.org
	Murdock	Ryan	Raymore	Emerg. Mgr.	816-892-3032	rmurdock@raymore.com
	Myers	Gordon	Midway School District	Superintendent	816-250-2994	gmyers@midwayk12.net
	Myler	Eric	Harrisonville	Fire Chief / Emergency Mgr	816-380-8925	emyler@ci.harrisonville.mo.us
	Nagel	Marlene	Mid-America Regional Council	Director Community Development	816-701-8218	mnagel@marc.org






**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**CASS COUNTY  
SEPT. 11, 2019**

**PLANNING MEETING**



1



**MITIGATION PLAN  
EVERY FIVE YEARS**

**LOCAL JURISDICTIONS – Cities, counties,  
school districts, colleges, special districts**

**Mitigation planning is a process to:**

- Identify hazards that pose risk
- Assess the potential impacts
- Develop goals, objectives, and actions
- Set priorities/ implement mitigation actions

2



## **BENEFITS OF ADOPTING A HAZARD MITIGATION PLAN**

- **Enables jurisdictions to assess their risks and vulnerabilities to natural (or man-made) hazards**
- **Enables inter-departmental and interdisciplinary discussions on hazards and possible mitigation measures**
- **Allows for broad community input**
- **Enables jurisdictions to seek FEMA grants**

3



## **BENEFITS OF PARTICIPATING IN A MULTI-JURISDICTIONAL PLAN**

- **Enables comprehensive approach to mitigate hazards that affect multiple jurisdictions**
- **Receives planning support and shares resources**
- **Avoids duplication of effort**
- **Improves coordination/communication among local jurisdictions**

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## FEMA HAZARD MITIGATION GRANTS

- **HAZARD MITIGATION GRANT PROGRAM** – After federally declared disaster, funds awarded to state. 20% in MO for mitigation projects. 75% fed 25% local
- **PRE-DISASTER MITIGATION GRANT PROGRAM** – Competitive grant funds available every yr through states. 75% fed 25% local
- **FLOOD MITIGATION GRANT PROGRAM** – Help communities with repetitive flood losses 75%/25% for insured properties & planning grants; 90%/10% for repetitive loss properties; 100% Fed for severe repetitive loss
- **ALL REQUIRE ADOPTED HAZARD MITIGATION PLAN**

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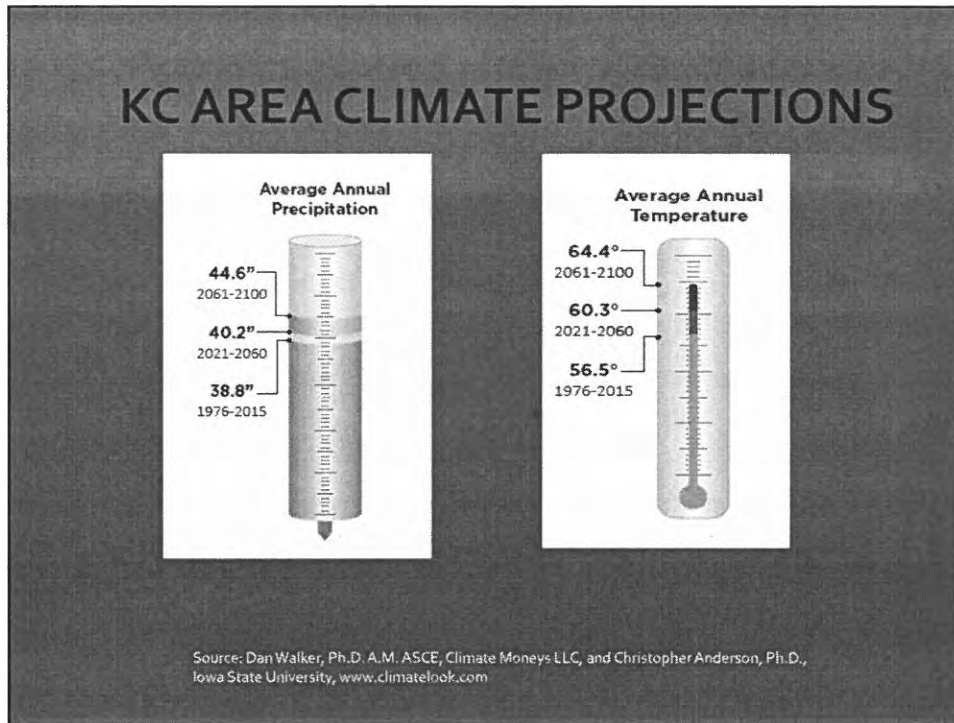


## 2020 PRIORITIES - NATURAL HAZARDS FOR CONSIDERATION


- **Flood-Related Hazards**
  - River Flooding
  - Flash Flooding
  - Dam/Levee Failure
- **Severe Winter Weather**
- **Tornadoes/Severe Thunderstorms**
- **Drought/Extreme Temperatures**



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### HAZARD IDENTIFICATION AND RISK ASSESSMENT

- **Hazard Profile – 5 Missouri counties**
- 34 Presidential disaster declarations since 1998 – avg 1.5 per year
- \$52 million in public assistance since 2002 avg of \$3 million annually
- \$38 million in hazard mitigation grants since 1993


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### SEVERE THUNDERSTORMS CASS COUNTY

	1950-2018	2014-2018
Wind > 57.5 mph	171	1 2016 Harrisonville
Hail > 1" Diameter	225	1 2018 Lake Winnebago
Lightning Strikes (w high wind/rain)	1	2 2015 and 2018


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### HEAT AND DROUGHT CASS COUNTY

	2009-2019 DROUGHT REPORTS	2009-2019 DROUGHT IMPACTS
AGRICULTURAL, PLANTS AND WILDLIFE	79	21
BUSINESS & INDUSTRY	0	1
FIRE	11	1
WATER SUPPLY	7	3
OTHER	21	10

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### SEVERE WINTER WEATHER CASS COUNTY

	2014 – 2/2019
Cold/Wind Chill	1 (2014)
Heavy Snow	1 (2014)
Winter Storm	2 (2014, 2019)
Ice Storm	2 (2018, 2019)
Blizzard	1 (2018)
Other Winter Weather	2 (2018, 2019)

2/28/2020

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### TORNADOES 1950-2018 CASS COUNTY

EF – SCALE	NUMBER OF TORNADOES	INJURIES/DEATHS
F0	20	0/0
F1	11	1/0
F2	2	0/0
F3	5	25/3
F4	0	0/0
F5	0	0/0
<b>TOTAL</b>	<b>38</b>	<b>26/3</b>

2/28/2020

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## FLOODING CASS COUNTY

FLOOD EVENTS (2014-2019)	TYPE/CAUSE
8 events – Freeman, Avon (2), Harrisonville, Strasburg, Pleasant Hill (2), Belton	Flash Flood, Heavy Rain
2 events – Freeman, Pleasant Hill	Flood, Heavy Rain

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## ONLINE PROFILE TOOL

### Cities and Counties

- Part I – Hazard Identification -Update the probability and severity of the five priority risks
- Part II – Local Capabilities Assessment (Administrative, Financial; Education and outreach; and planning and regulatory).
- Part III – Safe Growth Audit (How your community supports or could accommodate future growth).
- Part IV – Participation in National Flood Insurance Program


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## ONLINE PROFILE TOOL SCHOOL DISTRICTS/COLLEGES

- Part I – Hazard Identification (Assign a probability and severity for each priority risks – describe past events).
- Part II – Plans– Identify any plans or policies that could prevent or reduce the impacts.
- Part III – Mitigation Activities – Identify mitigation activities that your district may have taken over the past 5 years.
- Part IV – FEMA Grants – describe any grants you have applied for or received during the past 5 years.
- Part V – Technical Documents – Y/N has your district reviewed the state hazard mitigation plan?


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## PROFILE UPDATE ONLINE TOOL



### 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



#### 2020 Community/School Profile

The Mid-America Regional Council is updating the 2015 Regional Multi-Hazard Mitigation Plan to assist cities, counties, school districts, colleges and universities and other special districts on the Missouri side of the Kansas City metro area.

The plan is required for local jurisdictions to identify hazards that pose a greater risk to lives and property, and to outline actions that could be taken to mitigate those risks. Adoption of the plan enables the local jurisdictions to be eligible to apply for certain FEMA grants.

To become an eligible signatory to the 2020 Plan, each jurisdiction must participate in the planning process, provide important information for the plan and identify action steps that the local jurisdiction is willing to take over the next five years.

Please complete the profile by **September 9, 2019**. Thank you for your participation!

Questions: Marlene Nagel, [mnagel@marc.org](mailto:mnagel@marc.org)

Create New User
Log In To Account

#### INSTRUCTIONS & TIPS

- To get started, click on Create New User button, or
- If you have your or reference from the 2015 plan application, click the Log In to Account button.
  - Your 2015 information will pre-populate the application.
  - If you want a reference copy of your 2015 profile, go immediately to the Summary page and click on the Print Page button before you fill out the application with your 2020 update.
  - When your 2020 profile is complete, from the Summary page click the Print Page button to print or PDF a copy for your internal records.

600 Broadway, Suite 200  
Kansas City, MO 64105  
816-474-4240  
Fax 816-421-2758

MARC programs that receive federal funding may not discriminate against anyone on the basis of race, color or national origin, according to Title VI of the Civil Rights Act of 1964.  
Title VI 60001 | [www.marc.org](http://www.marc.org) | [www.marc.org/2015/02/2015-profile/](http://www.marc.org/2015/02/2015-profile/)  
Questions? Contact Marlene Nagel at [mnagel@marc.org](mailto:mnagel@marc.org)

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**GOALS & ACTIONS UPDATE ONLINE TOOL**

**MARC 2020 Regional Multi-Hazard Mitigation Plan**

Save Goals

Please review your 2015 Goals and Actions listed below and update the status and explanation accordingly. Then click the Save Goals button at the top.

**Mid-America Regional Council**

**TODAY'S GOALS**

**Goal: Increase public awareness and understanding of the benefits of "safe rooms"**

ACTION	STATUS	EXPLANATION OF STATUS
Develop, promote informational materials on both forms	Completed	Completed
Publish to reach target to conduct safe room consultation	Ongoing	Continued with further consultation available by 3/31/20

**Goal: Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/nat. hazards**

ACTION	STATUS	EXPLANATION OF STATUS
Assess existing facilities to provide adequate, safe work and visitor spaces employees of visitors	Completed	Facilities identified and an assessment completed. The assessment is in progress.
Review all available facilities to identify existing facilities with inadequate conditions for tornadoes and other risks	Ongoing	Review complete and final engineering drawings for current status of all facilities is in progress. Review, for safety, not applicable.
Consider adopting policies relating incorporation of safe room shelters in ongoing new public facility construction	Ongoing	Public works is in a position to review the requirements of the current I.C.C. codes adopted each jurisdiction, and to provide guidance.

2/28/2020

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**TYPES OF MITIGATION STRATEGIES**

- Public education and awareness
- Local plans and regulations
- Natural systems protection
- Structures and infrastructure

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## MITIGATION MEASURES TO CONSIDER - TORNADOES

- Promote the construction of safe rooms or shelters in schools, child care centers or nursing homes  
homes and mobile home parks  
public parks, particularly large  
sporting complexes

2/28/2020

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## MITIGATION MEASURES TO CONSIDER - TORNADOES

- Require wind engineering measures and construction techniques
- Adopt Residential Building Codes for high wind regions
- Education and Awareness Programs – conduct drills, teach safety precautions, support severe weather awareness, promote use of NOAA weather radios

2/28/2020

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## MITIGATION MEASURES TO CONSIDER – LIGHTNING AND HAIL

- Protect critical facilities and equipment with lightning protection devices
- Promote awareness of lightning and hail dangers and post warnings at outdoor park and recreation facilities
- Minimize hail damage in new construction

2/28/2020

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## MITIGATION MEASURES TO CONSIDER – SEVERE WIND

- Protect power lines and infrastructure with tree pruning, anchor systems, bury power lines, install redundancy, etc.
- Review wind hazards for your facilities to identify and address at-risk structures
- Promote site and building design standards to minimize wind damage
- Adopt and enforce high wind building codes

2/28/2020

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## MITIGATION MEASURES TO CONSIDER – SEVERE WINTER WEATHER

- Adopt building codes to include roof snow loads and discourage flat roof construction
- Lessen roadway impacts using snow fences to reduce blowing snow
- Conduct winter weather risk awareness activities
- Identify and assist vulnerable populations to remain in their homes or at heating centers


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## MITIGATION MEASURES TO CONSIDER – DROUGHT

- Develop drought emergency plan to include criteria for drought-related actions and to inform the public
- Monitor drought conditions and water supply and have plans to take actions as necessary
- Consider mandatory water conservation measures during drought emergencies for non-essential uses
- Improve water supply and delivery systems to save water
- Encourage use of drought-tolerant landscape design
- Educate residents on water saving techniques and farmers on conservation practices

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### MITIGATION MEASURES TO CONSIDER – EXTREME TEMPERATURES

- Reduce Urban Heat Island through tree and other vegetation plantings
- Educate the public on impacts of extreme temperatures on public health
- Assist vulnerable populations with heating or cooling centers, encourage utilities to provide assistance
- Educate property owners about freezing pipes

2/28/2020

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### MITIGATION MEASURES TO CONSIDER - FLOODING

- Incorporate flood mitigation into local planning
- Limit or restrict development in flood prone areas
- Adopt a stream buffer (or setback) ordinance
- Establish a green infrastructure program to expand green spaces to absorb rain water
- Improve stormwater management planning and adopt policies to reduce runoff

2/28/2020

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## HAZARD MEASURES TO CONSIDER – FLOOD (CONTINUED)

- Participate in Community Rating System
- Establish local funding for flood mitigation
- Remove existing structures from flood hazard areas
- Improve stormwater drainage system capacity
- Protect infrastructure and critical facilities
- Increase public awareness of flood risks

2/28/2020

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## HAZARD MITIGATION WEBSITE

Website that will help participants understand the hazards, identify potential risks, assist with assessing impact and tracking goals and actions.

2/28/2020

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## NEXT STEPS IN PLANNING PROCESS

- Complete regional profile using local information
- Discuss possible hazard mitigation strategies with local jurisdictions at second round public meetings in early Nov
- Draft plan for review by end of year
- Seek adoption of plan by local jurisdictions in March
- Submit to state and FEMA by May 1, 2020

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## QUESTIONS?

Marlene Nagel [mnagel@marc.org](mailto:mnagel@marc.org)

Jay Heermann, [jheermann@marc.org](mailto:jheermann@marc.org)

Tim Victor, [tvictor@marc.org](mailto:tvictor@marc.org)

816/474-4240

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*Kansas City Regional*

# Hazard Mitigation Plan

## **REGIONAL HAZARD MITIGATION PLAN**

### **PLATTE COUNTY MEETING**

**Friday, September 6, 2019**

**9 am – 11 am**

**Platte County Resource Center, 11724 NW Plaza Circle, Kansas City, MO**




## **AGENDA**

1. Welcome/introductions
2. Background/Purpose and Value of the Hazard Mitigation Plan
3. Elements of the plan – risk profiles, local jurisdictions' profile and goals/strategies. Local jurisdiction and school profile
4. Goals/strategies – what are the considerations to identifying these and what are some that are more commonly considered by cities and counties, school districts and colleges, other special districts
5. Mapping/Data Tool
6. Next steps in our process
7. Questions/Discussion







## Hazard Mitigation Plan Meeting at Platte County, MO Friday, September 6, 2019

Initial if Present	Last Name	First Name	Organization	Title	Phone	Email
	Priddy	Joyce	Weston	Councilmember		jpriddy@aol.com
	Reik	Michael	Platte County R-3 School District	Superintendent	816-858-5420	reikm@platteco.k12.mo.us
	Rinehart	John	West Platte R-II School District	Superintendent	816-640-2236	rinehartj@wpsd.net
	Stackhouse	Chris	Edgerton	EM/Assistant Chief	8168052393	Stack719@kc.rr.com
	Taylor	Jeff	Houston Lake	Emergency Management Director	816-686-3262	jtaylor@riversidemo.com
	Taylor	Jeff	Riverside	EM Dir	816-718-0987	jetaylor@riversidemo.com
	Todd	Dennis	Lake Waukomis	Mayor	8167412670	waukomiscityclerk@kc.rr.com
	Voorhies	Carleton	Weatherby Lake	EM Coordinator	816-309-2293	cpvoor@att.net
	Wellington	Joe	Platte City	Chief of Police	816-858-5150	jwellington@plattacity.org


## Hazard Mitigation Plan Meeting at Platte County, MO Friday, September 6, 2019

Initial if Present	Last Name	First Name	Organization	Title	Phone	Email
	James	Jason	Northland Regional Ambulance District	Supervisor	816-858-4450	james@nrad-ems.org
	Johnson	Brad	Dearborn Area Fire Protection District	Fire Chief	816-992-8919	beeybeej@yahoo.com
	Johnson	Lynn	West Platte Fire Protection District	Administrator of Emergency Services	816-640-2724	ljohnson@wpfpd.org
	Jordan	Jon	Parkville	Captain	816-741-4454	jjordan@parkvillemo.gov
	Kerns	Sheri	Dearborn	Alderman	816-992-0111	posthaste4-sheri@yahoo.com
	Kerns	Jim	Lake Waukomis Police Department	Chief of Police	8167412071	jkerns@cityofplattewoods.org
	Kerns	Jim	Platte Woods	Chief of Police/EMD	816-741-7973	jkerns@cityofplattewoods.org
	Kincaid	Beverly	Village of Farley	Emergency Manager	816-330-3359	kincbk@planetkc.com
	Lachky	Stephen	Parkville	Community Development Dir		slachky@parkvillemo.gov
	Large	Mike	Weston	PW Superint	816-640-5477	large.wpw@westonmo.us
	Lemon	Brett Central	Camden Point Fire Protection District	Assistant Fire Chief <i>MAD-PC</i>	816-935-9604	firemedic04@me.com
	London	Will	Park University	Director of Security	816-584-6228	william.london@park.edu
	Loy	Kenny	Platte City	Public Works Director		kloy@plattcity.org
	Matt	Karl	North Platte R-I School District	Superintendent	816-450-3511	karl.matt@nplatte.k12.mo.us
	Miller	David	City Engineer	City of KCMO Public Works	816-513-2746	David.H.Miller@kcmo.org
	Murray	Patsy	Tracy	City Clerk/Collector	816-858-5555	cityoftracymo@kc.rr.com
	O'Neal	Mike		Emerg Mgr	816-858-1966	michael.oneal@plattsheriff.org

## Hazard Mitigation Plan Meeting at Platte County, MO Friday, September 6, 2019


Initial if Present	Last Name	First Name	Organization	Title	Phone	Email
	Abel	Alysen	Parkville	Public Works Director		aabel@parkvillemo.gov
	Baxter	April	Village of Ferrelview	Village Clerk	816-464-5010	vof.clerk@gmail.com
	Blanton	Terry	Weston	Police Chief	816-640-2455	blanton.wpd@westonmo.us
	Carter	Barbra	Iatan	City Clerk		villageofiatan@gmail.com
	Chrisman	Kevin	Parkville	Police Chief	816-234-5520	kchrisman@parkvillemo.gov
	Clark	Kelly	Northmoor	Chief of Police	8166794859	kclark@northmoorpd.com
	Colvin	Joshua	Park Hill School District	Director of Student Services	8163594036	colvinj@parkhill.k12.mo.us
	Cowherd	Jeanette	Park Hill School District	Superintendent	816-359-4050	cowherdj@parkhill.k12.mo.us
	Cull	Dean	Southern Platte Fire Prot. Dist.	Division Chief/Fire Marshal	816-741-2900	dcull@spfpd.com
	Davis	Kevin	Weatherby_Lake	Chief of Police	816-741-5545	k.davis@cityofweatherbylake-mo.gov
	Deckman	Rodney	Edgerton -Trimble Fire Protection District	Fire Chief	816-790-3396	rodney.deckman@etfpd.org
	Dudley	Julie	Camden Point	City Clerk	816-506-0062	jdudley@avisfurniture.com
	Duffy	Mike	Riverside	Community Development Dir		mduffy@riversidemo.com
	Erickson	Daniel	Platte County	Community Development Dir		derickson@co.platte.mo.us
	Gant	Karla	Ridgely	Treasurer	816-532-0970	kwgant@juno.com
	Gehrt	DJ	Platte City	City Administrator		djgehr plattcity.org
	Heim	Bob	Platte County	Public Works Director		bheim@co.platte.mo.us

**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**PLATTE COUNTY  
SEPT. 6, 2019**

**PLANNING MEETING**



1



**MITIGATION PLAN  
EVERY FIVE YEARS**

**LOCAL JURISDICTIONS – Cities, counties,  
school districts, colleges, special districts**

**Mitigation planning is a process to:**

- Identify hazards that pose risk
- Assess the potential impacts
- Develop goals, objectives, and actions
- Set priorities/ implement mitigation actions

2







*Kansas City Regional*

# **Hazard Mitigation Plan**

## **REGIONAL HAZARD MITIGATION PLAN**

### **CLAY COUNTY MEETING**

**Thursday, September 12, 2019**

**1 pm – 3 pm**

**Gladstone Community Center**

**6901 N. Holmes Street, Gladstone, MO**

### **AGENDA**

1. Welcome/introductions
2. Background/Purpose and Value of the Hazard Mitigation Plan
3. Elements of the plan – risk profiles, local jurisdictions' profile and goals/strategies. Local jurisdiction and school profile
4. Goals/strategies – what are the considerations to identifying these and what are some that are more commonly considered by cities and counties, school districts and colleges, other special districts
5. Mapping/Data Tool
6. Next steps in our process
7. Questions/Discussion



**KC Regional Hazard Mitigation Plan Meeting - Clay County, Missouri (Gladstone)**  
**Thursday, September 12, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Akin	Will	Clay County	Emerg Mgr	816-407-3739	wakin@sheriffclayco.com
	Berlin	Eric	North Kansas City	City Administrator		eberlin@nkc.org
	Birdsong	Chad	Excelsior Springs	Public Works Dir		cbirdsong@excelsiorsprings.gov
	Blankenship III	John	Birmingham	Chair		villageofbirminghammo@gmail.com
	Clemens	Daniel	North Kansas City Schools	Superintendent	8164135088	superintendent@nkcschools.org
	Cline	Dave	Smithville Area Fire Protection District	Fire Chief	816-532-4902	dcline@safpd.com
	Copeland	Sara	North Kansas City	Planning Dir		scopeland@nkc.org
	Daugherty	Sean	Gladstone Emergency Management	Deputy Chief/EM	816-469-9712	seand@gladstone.mo.us
	Draughon	Laurie	Oakwood Park	Chair	816-277-4882	villageofoakwoodpark@gmail.com
	Eldridge	Jim	Kearney	City Administrator		jeldridge@kearneymo.us
	Evans	Melissa	Clay Co Emergency Mgt	Em Management		mevans@sheriffclayco.com
	Hawver	Patrick	North Kansas City	Public Works Dir		phawver@nkc.org
	Hoehn	Dan	Excelsior Springs 40 School District	Superintendent	816-630-9200	dhoehn@ga-essd40.com
	Jackson	Jay	Missouri City 56 School District	Superintendent	816.750.4391	jj@mocity.k12.mo.us
	Jenkins	Mike	North Kansas City Fire Dept	Battalion Chief	816-274-6025	mjenkins@nkc.org
	Jones	Kipp	Clay County	Planning & Zoning Dir		kjones@claycountymo.gov
	Liningier	Jason	Mosby	Emergency Manager	(816)916-3168	dadofzsvrtbabies@aol.com
	Lockridge	Jason	Smithville Police Department	Chief of Police	816-532-0500	jlockridge@smithvillemo.org
	Long	Alan	Randolph	Mayor		cityofrandolphmo@gmail.com
	McClelland	Aarin	Oakview	Chair	816-436-9150	
	McGovern	Molly	Excelsior Springs	City Administrator	816-630-0752	mmcgovern@excelsiorsprings.gov
	Mehaffy	Melinda	Excelsior Springs	Community Development Dir		mmehaffy@excelsiorsprings.gov

KC Regional Hazard Mitigation Plan Meeting - Clay County, Missouri (Gladstone)  
 Thursday, September 12, 2019

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Menard	Mary	Oaks	City Clerk		clerk@villageofoaks.org
	Miles	Eric	Claycomo	Fire Chief		cityhall@claycomo.org
KW	Nakahodo	Kim	North Kansas City	Asst City Administrator		knakahodo@nkc.org
	Napoli	Alan	Gladstone	Community Development Administrator		alann@gladstone.mo.us
	Nebergall	Tim	Gladstone	Public Works Dir		timn@gladstone.mo.us
	Nicely	Bill	Kearney R-1 School District	Superintendent	816-628-4116	nicelyb@ksdr1.net
	Nolker	Matt	Lawson	City Administrator	816-580-3217	cityadmin@cityoflawsonmo.org
	Noll	Andy	Liberty	Public Works Dir		anoll@ci.liberty.mo.us
DP	Paddack	Dustin	City of Liberty Fire Dept.	Fire Marshal	816-439-4310	dpaddack@ci.liberty.mo.us
	Pavlich	David	Kearney	Community Development Dir	816-903-4731	dpavlich@kearneymo.us
	Petty	Frankie	Glenaire	Mayor		francesmpetty@gmail.com
	Pratt	Kevin	Kearney	Fire Chief	816-628-4122	kpratt@kearneyfire.org
	Railey	Monte	Missouri City	City Clerk		mocityclerk@gmail.com
	Ramsey	Eric	Clay Co Emergency Mgt	EMD	8164073732	eramsey@claycountymo.gov
	Roetman	Tony	Smithville Police Department	Sgt	816-532-050	troetman@smithvillemo.org
	Rouchka	Dan	Oakwood	Chair	816-286-1152	
	Russell	Robert	North Kansas City	Detective PD	816-412-7937	rrussell@nkc.org
	Schuetz	Todd	Smithville R-II School District	Superintendent	816-532-0406	schuetzt@smithville.k12.mo.us
	Sharp	Katherine	Liberty	Planning Manger		planner@ci.liberty.mo.us
	Slater	David	Pleasant Valley	Mayor		dslater@pleasantvalleymo.org
	Snider	P. Michael	Liberty Fire Department	Fire Chief	816-439-4312	msnider@libertymo.gov
	Swope	Ronnie	Prathersville	Chair		prathersvillemo@gmail.com



KC Regional Hazard Mitigation Plan Meeting - Clay County, Missouri (Gladstone)  
 Thursday, September 12, 2019

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Menard	Mary	Oaks	City Clerk		clerk@villageofoaks.org
	Miles	Eric	Claycomo	Fire Chief		cityhall@claycomo.org
	Nakahodo	Kim	North Kansas City	Asst City Administrator		knakahodo@nkc.org
	Napoli	Alan	Gladstone	Community Development Administrator		alann@gladstone.mo.us
	Nebergall	Tim	Gladstone	Public Works Dir		timn@gladstone.mo.us
	Nicely	Bill	Kearney R-1 School District	Superintendent	816-628-4116	nicelyb@ksdr1.net
	Nolker	Matt	Lawson	City Administrator	816-580-3217	cityadmin@cityoflawsonmo.org
	Noll	Andy	Liberty	Public Works Dir		anoll@ci.liberty.mo.us
	Paddack	Dustin	City of Liberty Fire Dept.	Fire Marshal	816-439-4310	dpaddack@ci.liberty.mo.us
	Pavlich	David	Kearney	Community Development Dir	816-903-4731	dpavlich@kearneymo.us
	Petty	Frankie	Glenaire	Mayor		francesmpetty@gmail.com
	Pratt	Kevin	Kearney	Fire Chief	816-628-4122	kpratt@kearneyfire.org
	Railey	Monte	Missouri City	City Clerk		mocyclerk@gmail.com
	Ramsey	Eric	Clay Co Emergency Mgt	EMD	8164073732	eramsey@claycountymo.gov
	Roetman	Tony	Smithville Police Department	Sgt	816-532-050	troetman@smithvillemo.org
	Rouchka	Dan	Oakwood	Chair	816-286-1152	
	Russell	Robert	North Kansas City	Detective PD	816-412-7937	rrussell@nkc.org
	Schuetz	Todd	Smithville R-II School District	Superintendent	816-532-0406	schuetzt@smithville.k12.mo.us
	Sharp	Katherine	Liberty	Planning Manger		planner@ci.liberty.mo.us
	Slater	David	Pleasant Valley	Mayor		dslater@pleasantvalleymo.org
	Snider	P. Michael	Liberty Fire Department	Fire Chief	816-439-4312	msnider@libertymo.gov
	Swope	Ronnie	Prathersville	Chair		prathersvillemo@gmail.com




KC Regional Hazard Mitigation Plan Meeting - Clay County, Missouri (Gladstone)  
 Thursday, September 12, 2019

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Akin	Will	Clay County	Emerg Mgr	816-407-3739	wakin@sheriffclayco.com
	Berlin	Eric	North Kansas City	City Administrator		eberlin@nkc.org
	Birdsong	Chad	Excelsior Springs	Public Works Dir		cbirdsong@excelsiorsprings.gov
	Blankenship III	John	Birmingham	Chair		villageofbirmingham@gmail.com
	Clemens	Daniel	North Kansas City Schools	Superintendent	8164135088	superintendent@nkcschools.org
	Cline	Dave	Smithville Area Fire Protection District	Fire Chief	816-532-4902	dcline@safpd.com
	Copeland	Sara	North Kansas City	Planning Dir		scopeland@nkc.org
	Daugherty	Sean	Gladstone Emergency Management	Deputy Chief/EM	816-469-9712	seand@gladstone.mo.us
	Draughon	Laurie	Oakwood Park	Chair	816-277-4882	villageofoakwoodpark@gmail.com
	Eldridge	Jim	Kearney	City Administrator		jeldridge@kearneymo.us
	Evans	Melissa	Clay Co Emergency Mgt	Em Management		mevans@sheriffclayco.com
	Hawver	Patrick	North Kansas City	Public Works Dir		phawver@nkc.org
	Hoehn	Dan	Excelsior Springs 40 School District	Superintendent	816-630-9200	dhoehn@ga.essd40.com
	Jackson	Jay	Missouri City 56 School District	Superintendent	816.750.4391	jj@mocity.k12.mo.us
	Jenkins	Mike	North Kansas City Fire Dept	Battalion Chief	816-274-6025	mjenkins@nkc.org
	Jones	Kipp	Clay County	Planning & Zoning Dir		kjones@claycountymo.gov
	Liminger	Jason	Mosby	Emergency Manager	(816)916-3168	dadof2swtbabies@aol.com
	Lockridge	Jason	Smithville Police Department	Chief of Police	816-532-0500	jlockridge@smithvillemo.org
	Long	Alan	Randolph	Mayor		cityofrandolphmo@gmail.com
	McClelland	Aarin	Oakview	Chair	816-436-9150	
	McGovern	Molly	Excelsior Springs	City Administrator	816-630-0752	mme.govern@excelsiorsprings.gov
	Mehaffy	Melinda	Excelsior Springs	Community Development Dir		mmeahffy@excelsiorsprings.gov






**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**CLAY COUNTY  
SEPT. 12, 2019**

**PLANNING MEETING**



1



**MITIGATION PLAN  
EVERY FIVE YEARS**

**LOCAL JURISDICTIONS – Cities, counties,  
school districts, colleges, special districts**

**Mitigation planning is a process to:**

- Identify hazards that pose risk
- Assess the potential impacts
- Develop goals, objectives, and actions
- Set priorities/ implement mitigation actions

2



# REGIONAL HAZARD MITIGATION PLAN MEETING

RAY COUNTY – SEPTEMBER 4, 2019

2 – 4 PM

EAGLETON CIVIC CENTER, 1015 W ROYLE STREET, RICHMOND, MO

## AGENDA

1. Welcome/introductions
2. Background/purpose of the Hazard Mitigation Plan
3. Elements of the plan – risk profiles, local jurisdictions' profile and goals/strategies.
  - a. What does the update of the risk profile tell us for each county?
  - b. Local jurisdiction profile – review tool, answer questions
  - c. Review/Demonstrate New Mapping tool
  - d. Goals/strategies – what are the considerations to identifying these and what are some that are more commonly considered by cities and counties, school districts and colleges, other special districts
4. Next steps in our process



[https://www.richmond-dailynews.com/news/hazard-mitigation/article\\_fd4428ac-d000-11e9-b8ef-4bbd36b4abea.html](https://www.richmond-dailynews.com/news/hazard-mitigation/article_fd4428ac-d000-11e9-b8ef-4bbd36b4abea.html)

TOP STORY

## HAZARD MITIGATION

Jack 'Miles' Ventimiglia Editor-in-chief  
Sep 5, 2019



SLIDES HELP Mid-America Regional Council Community Development Director Marlene Nagel explain the r hazard mitigation plan that could lead to federal funding.

J.C. VENTIMIGLIA | Richmond Daily News

RICHMOND – County, emergency management, school district and leaders of other governments within Ray County met to discuss hazard mitigation at the Eagleton Center on Wednesday.

Hazards may be defined as tornadoes and floods.

From the Mid-America Regional Council, Community Development Director Marlene Nagel provided information to the group of about 15 people about the need for, and the value of, having a hazard mitigation plan.

“The Federal Emergency Management Agency, FEMA, requires that communities adopt a plan every five years,” Nagel said.

This area last adopted a plan four years ago.

TO FIND OUT MORE, SEE THE FRIDAY RICHMOND NEWS

Jack Ventimiglia

**KC Regional Hazard Mitigation Plan Meeting - Eagleton Civic Center Richmond, Missouri  
Wednesday, September 4, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
<i>SA</i>	Archibald	Scott	Orrick R-XI	Superintendent	816-770-0094	sarchibald@orrick.k12.mo.us
<i>JMA</i>	Aytes	Mike	Richmond R-XVI	Superintendent	816-776-6912	maytes@richmond.k12.mo.us
	Barnett	Gail	Crystal Lakes	Mayor	816-637-6677	
	Berndt	Marla	Homestead	City Clerk	816-900-1147	
<i>KB</i>	Bilton	Kelly	Orrick Fire <small>Detachment District</small>	<i>Captain</i> Fire Captain	<i>816-514-3590</i>	<i>bilton5@aol.com</i> <i>ORRICK FIRE CHIEF@gmail.com</i>
<i>TC</i>	Cavanah	Trey	Hardin-Central C-2	Superintendent	660-398-4394	tcavanah@hardin-central.org
	Cline	Cynthia	Elmira	City Clerk	816-296-4010	
<i>CH</i>	Harper	Carl	RAY COUNTY	Emerg Coordinator	816-470-0787	raycoemergency@mediacombb.net
<i>LA</i>	Hastings	Lisa	Richmond	City Planner		lhastings@cityofrichmondmo.org
<i>DA</i>	Hufford	Deanna	Orrick	City Clerk		deanna.hufford@cityoforrick.org
	Kasserman	Sondra	Wood Heights	City Clerk		sondra.kasserman@woodheights-mo.gov
<i>BK</i>	King	Bob	RAY COUNTY	Presiding Commissioner	816-776-4507	raycountycommissioners@yahoo.com
<i>P.L.</i>	Lam	Patricia	Hardin	City Clerk	<i>660-398-4537</i>	cityofhardin.plam@gmail.com
<i>Majie</i>	Long	Marjorie	Camden	City Clerk	816-290-5337	marjorielong201@hotmail.com
<i>Majie</i>	Long	Marjorie	Fleming	City Clerk	816-290-5337	marjorielong201@hotmail.com
<i>Majie</i>	Long	Marjorie	Henrietta	City Clerk	816-290-5337	marjorielong201@hotmail.com
<i>MS</i>	<del>Quirk</del> Schmitz	<del>Lonny</del> Roger	Richmond Lawson R-XIV	Fire Chief Superintendent	816-776-2115 x107 816-580-7277	devildoc400@aol.com schmitzr@lawsoncardinals.org
<i>mf</i>	Nagel	Marlene	MARC	Community Development Director	816-701-8218	mnagel@marc.org







Country 6 incl 3 co commissioners  
city 4  
school district 3  
fpd 2  
news media 1  


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16  
2 Marc 2  

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18

**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**RAY COUNTY  
SEPT 4, 2019**

PLANNING MEETING



1



**MITIGATION PLAN  
EVERY FIVE YEARS**

**LOCAL JURISDICTIONS – Cities, counties,  
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- Identify hazards that pose risk
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- Set priorities/ implement mitigation actions

2





*Kansas City Regional*

# **Hazard Mitigation Plan**

## **REGIONAL HAZARD MITIGATION PLAN**

### **JACKSON COUNTY MEETING**

**Tuesday, September 10, 2019**

**1 pm – 3 pm**

**Independence Truman Memorial Building**

**416 West Maple, Independence, MO**

### **AGENDA**

1. Welcome/introductions
2. Background/Purpose and Value of the Hazard Mitigation Plan
3. Elements of the plan – risk profiles, local jurisdictions' profile and goals/strategies. Local jurisdiction and school profile
4. Goals/strategies – what are the considerations to identifying these and what are some that are more commonly considered by cities and counties, school districts and colleges, other special districts
5. Mapping/Data Tool
6. Next steps in our process
7. Questions/Discussion



**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri**  
**Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Austin	Lewis	Grandview Fire Dept.	Assistant Fire Marshall	816-316-4961	Laustin@grandview.org
	Beale	James	Grain Valley	Police Chief		jbeale@grainvalleypolice.org
	Bedell	Mark	Kansas City Public School District #33	Superintendent	816-418-7000	askthesupt@kcpublicschools.org
	Bobadilla	Joe	Buckner	City Administrator		jbobadilla@cityofbuckner.org
	Boatright	Les	CJC Emergency Management Agency	Assistant Emergency Mgt. Director	816-463-8530	lboatright@cjcjcpd.org
	Carpenter	Andrew	City of Independence EM			
	Carpenter	Dennis	Lee's Summit School District	Superintendent	816-986-2197	dennis.carpenter@lsr7.net
	Cash	Daniel	University of Missouri Extension		816-482-5863	cashdr@missouri.edu
	Carroll	Chris	Kansas City, MO	Emerg Planner	816-513-8603	christopher.carroll@kcmo.org
	Casey	Pat	Sugar Creek	Fire Chief - Interim City Administrator		pcasey@sugar-creek.mo.us
	Chiodini	Chris	Grandview	Community Development Dir	816-316-4800	cchiodini@grandview.org
	Cole	Tom	Blue Springs	Community Development Dir	816-228-0115	tcole@bluespringsgov.com
	Connelly	Jim	Kansas City, MO	Emergency Manager		james.connelly@kcmo.org
	Curry	Mike	Jackson Emergency Management	Emerg Mgr	816-881-4625	mcurry@jacksongov.org
	DeBoard	Virginia	Metropolitan Community Colleges	Emergency Mgr	816-604-1225	virginia.deboard@mcckc.edu
	Dunning	Mark	Lee's Summit	Asst City Manager		mark.dunning@cityofls.net
	Dyer	Kimberlyn	Levasy	Mayor		cityoflevasy@gmail.com
	Eden	Jim	Lee's Summit Fire Department	Assistant Chief		
	Elam	Ryan	Lee's Summit	Dir of Development Services	816-969-1202	ryan.elam@cityofls.net
	Gaddie	Brian	Jackson County Public Works	Public Works Director		bgaddie@jacksongov.org
	Gliniecki	Dante	Independence	Emerg Mgr	816-325-7133	dgliniecki@indepmo.org

**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri  
Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Goddard	Thomas	Lake Tapawingo	Mayor		mayor@laketapawingomo.org
	Gooch	Nicholas	Grain Valley R-5 School District	Assoc Superintendent		ngooch@gvr5.net
	Goodman	Scott	Jackson County Sheriff's Office	EM		sgoodman@jacksongov.org
	Graham	Ron	Grandview	Fire Chief		rgraham@grandview.org
	Gramling	Tim	Independence	Public Works Director		tgramling@indepmo.org
	Grote	Jeff	Central Jackson Co FPD	Fire Chief		jgrote@cjcpd.org
	Gungor	Cemal	Grandview	City Administrator	816-316-4800	cgungor@grandview.org
	Hayes	Jeannie	Riverbend	City Clerk		jhayes0763@comcast.net
	Hall	Ryan	Lee's Summit School District	Supervisor of Safety and Security	816-986-2197	Ryan.Hall@lsr7.net
	Herl	Dale	Independence School District	Superintendent	816-521-5300	dale_herl@idsdschools.org
	Hufford	Billie	Grandview	Building Dept	816-316-4823	bhufford@grandview.org
	Hunt	Ryan	Grain Valley	City Administrator	816-847-6200	rhunt@cityofgrainvalley.org
	Jefferies	Troy	Sibley	Chair		sibleycityhall@comcast.net
	Keele	Doreen	Unity Village	City Clerk		keeled@unityonline.org
	Kinder	Paul	Blue Springs School District	Superintendent	816-874-3200	pkinder@bssd.net
	Lynch	James	Raytown	Chief of Police	816-737-6100	lynchj@raytownpolice.org
	Mallon	Mike	City of Blue Springs	Community Development Assistant Director	816-228-0124	mmallon@bluespringsgov.com
	Manley	Dan	Lee's Summit	Interim Fire Chief	816-969-1304	dan.manley@cityofls.net
	Martin	Douglas	Lone Jack	Mayor		mayor@lonejackmo.org
	McIntyre	Sherri	Kansas City, MO	Public Works Director		sherri.mcintyre@kcmo.org
	Mezger	Dena	Lee's Summit	Public Works Director	816-969-1806	dena.mezger@cityofls.net



**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri**  
**Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Morgan	Steve	Fort Osage			ngooch@gvr5.net
	Muenz	Bob	Blue Springs	Police Chief		bmuenz@bluespringsgov.com
	Nelson	Victoria	City of Lee's Summit			
	Randall	Mark	Independence	Asst City Manager		mrandall@indepmo.org
	Randolph	Dennis	Grandview	Public Works Director	816-316-4800	drandolph@grandview.org
	Rasmussen	Tracy	Lake Lotawana	Mayor		trasmussen@lakelotawana.org
	Roberts	Cheri	City of Greenwood	City Clerk	816-537-6969	croberts@greenwoodmo.com
	Rodriquez	Kenny	Grandview C-4 School District	Superintendent	816-316-5000	kenny.rodriquez@grandviewC4.net
	Sandie	Chris	Blue Springs	Public Works Dir	816-228-0115	csandie@bluespringsgov.com
	Scannell	Tom	Independence	Community Development Dir	816-325-7830	tscannell@indepmo.org
	Sherwood	Mark	Oak Grove	Emerg Mgr	816-690-3773	msherwood@cityofaogrove.com
	Sherwood	Mark	Oak Grove/ Sni-Valley Fire Protection District	Emerg Mgr	816-690-3773	msherwood@cityofaogrove.com
	Shirley	Eric	Kansas City University of Medicine & Biosciences	Manager, Safety & Emerg Mgt	816-654-7910	eshirley@kcumb.edu
	Smith	Kenneth	Lake Winnebago	Emerg Mgr	816-591-5259	lwkensmith@comcast.net
	Snodgrass	Jason	Fort Osage R-1 School District	Superintendent	816-650-7005	jsnodgrass@fortosage.net
	Snow	Marc	Grain Valley R-5 School District	Superintendent	816-847-5006	msnow@gvr5.net
	Tarwater	Matthew	Lone Jack C-6 School District	Superintendent	816-697-3539	mtarwater@lonejackc6.net
	Tatum	Lamont	Greenwood	Acting Police Chief		ltatum@greenwoodpd.com
	Taylor	Kara	City of Lee's Summit Public Works	Environmental Specialist	816-969-1800	publicworks@cityofls.net
	Thomsen	Bryan	Oak Grove R-VI School District	Superintendent	816-690-4156	bthomsen@oakgrove.k12.mo.us
	Walker	Travis	Greenwood	Building/Zoning/Public Works Dir	816-537-6969	twalker@greenwoodmo.com

KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri  
 Tuesday, September 10, 2019

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Weaver	Levi	Greenwood	Mayor		lweaver@greenwoodmo.com
	Weishaar	Michael	Center School District	Superintendent	816-349-3300	mweishaar@center.k12.mo.us
	Williams	Jeff	Kansas City, MO	Planning & Dev Director		jeffrey.williams@kcmo.org
DMR	Call	Don (brod)	SACOHD	Emrg Planner	816 404 6134	don.call@tmcmed.org

SMT Hoeger ~~Steven~~ TMC Safety/Em 816-858-2330 Steven.Hoeger@tmcmed.org  
 JH Hilde Geoff IEP Planner 816-355-6960 G.Hinkle@indpsmo.org

SM Wilke Bruce Jac. Co. Planner 816-503-4802 bwilke@jacksongov.org







Karen Conrad JC Emrg Prep 816 241 7540 Kconrad@jacksongov.org



**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri  
Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Austin	Lewis	Grandview Fire Dept.	Assistant Fire Marshall	816-316-4961	Laustin@grandview.org
	Beale	James	Grain Valley	Police Chief		jbeale@grainvalleypolice.org
	Bedell	Mark	Kansas City Public School District #33	Superintendent	816-418-7000	askthesupt@kcpublicschools.org
	Bobadilla	Joe	Buckner	City Administrator		jbobadilla@cityofbuckner.org
	Carpenter	Andrew	City of Independence EM			
	Carpenter	Dennis	Lee's Summit School District	Superintendent	816-986-2197	dennis.carpenter@lsr7.net
	Cash	Daniel	University of Missouri Extension		816-482-5863	cashdr@missouri.edu
	Carroll	Chris	Kansas City, MO	Emerg Planner	816-513-8603	christopher.carroll@kcmo.org
	Casey	Pat	Sugar Creek	Fire Chief - Interim City Administrator		pcasey@sugar-creek.mo.us
	Chiodini	Chris	Grandview	Community Development Dir	816-316-4800	cchiodini@grandview.org
	Cole	Tom	Blue Springs	Community Development Dir	816-228-0115	tcole@bluespringsov.com
	Connelly	Jim	Kansas City, MO	Emergency Manager		james.connelly@kcmo.org
	Curry	Mike	Jackson Emergency Management	Emerg Mgr	816-881-4625	mcurry@jacksongov.org
	DeBoard	Virginia	Metropolitan Community Colleges	Emergency Mgr	816-604-1225	virginia.deboard@mcckc.edu
	Dunning	Mark	Lee's Summit	Asst City Manager		mark.dunning@cityofls.net
	Dyer	Kimberlyn	Levasy	Mayor		cityoflevasy@gmail.com
	Eden	Jim	Lee's Summit Fire Department	Assistant Chief		
	Elam	Ryan	Lee's Summit	Dir of Development Services	816-969-1202	ryan.elam@cityofls.net
	Gaddie	Brian	Jackson County Public Works	Public Works Director		bgaddie@jacksongov.org
	Gliniecki	Dante	Independence	Emerg Mgr	816-325-7133	dgliniecki@indepmo.org
	Goddard	Thomas	Lake Tapawingo	Mayor		mayor@laketapawingomo.org
	Gooch	Nicholas	Grain Valley R-5 School District	Assoc Superintendent		ngooch@gvr5.net
	Goodman	Scott	Jackson County Sheriff's Office	EM		sgoodman@jacksongov.org
	Graham	Ron	Grandview	Fire Chief		rgraham@grandview.org

**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri  
Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
	Gramling	Tim	Independence	Public Works Director		tgramling@indepmo.org
	Grote	Jeff	Central Jackson Co FPD	Fire Chief		jjgrote@cjcfpd.org
	Gungor	Cemal	Grandview	City Administrator	816-316-4800	cgungor@grandview.org
	Hayes	Jeannie	Riverbend	City Clerk		jhayes0763@comcast.net
	Hall	Ryan	Lee's Summit School District	Supervisor of Safety and Security	816-986-2197	Ryan.Hall@ls7.net
	Herl	Dale	Independence School District	Superintendent	816-521-5300	dale_herl@isdschools.org
	Hufford	Billie	Grandview	Building Dept	816-316-4823	bhufford@grandview.org
	Hunt	Ryan	Grain Valley	City Administrator	816-847-6200	rhunt@cityofgrainvalley.org
	Jefferies	Troy	Sibley	Chair		sibleycityhall@comcast.net
	Keele	Doreen	Unity Village	City Clerk		keeledl@unityonline.org
	Kinder	Paul	Blue Springs School District	Superintendent	816-874-3200	pkinder@bssd.net
	Lynch	James	Raytown	Chief of Police	816-737-6100	lynchj@raytownpolice.org
	Manley	Dan	Lee's Summit	Interim Fire Chief	816-969-1304	dan.manley@cityofls.net
	Martin	Douglas	Lone Jack	Mayor		mayor@lonejackmo.org
	McIntyre	Sherri	Kansas City, MO	Public Works Director		sherri.mcintyre@kcmo.org
	Mezger	Dena	Lee's Summit	Public Works Director	816-969-1806	dena.mezger@cityofls.net
	Morgan	Steve	Fort Osage			smoosch@fvr5.net
	Muenz	Bob	Blue Springs	Police Chief		bmuenz@bluespringsovm.com
	Nelson	Victoria	City of Lee's Summit			
	Randall	Mark	Independence	Asst City Manager		mrandall@indepmo.org
	Randolph	Dennis	Grandview	Public Works Director	816-316-4800	drandolph@grandview.org
	Rasmussen	Tracy	Lake Lotawana	Mayor		trasmussen@lakelotawana.org
	Roberts	Cheri	City of Greenwood	City Clerk	816-537-6969	croberts@greenwoodmo.com
	Rodriguez	Kenny	Grandview C-4 School District	Superintendent	816-316-5000	kenny.rodriquez@grandviewC4.net



**KC Regional Hazard Mitigation Plan Meeting - Jackson County, Missouri  
Tuesday, September 10, 2019**

Initial if Present	Last Name	First Name	Organization/ Location	Title	Phone	Email
<i>CS</i>	Sandie	Chris	Blue Springs	Public Works Dir	816-228-0115	csandie@bluespringsgov.com
	Scannell	Tom	Independence	Community Development Dir	816-325-7830	tscannell@indepmo.org
<i>MS</i>	Sherwood	Mark	Oak Grove	Emerg Migr	816-690-3773	msherwood@cityofoakgrove.com
<i>MS</i>	Sherwood	Mark	Sni-Valley Fire Protection District	Emerg Migr	816-690-3773	msherwood@cityofoakgrove.com
	Shirley	Eric	Kansas City University of Medicine & Biosci	Manager, Safety & Emerg Mgt	816-654-7910	eshirley@kcumb.edu
	Smith	Kenneth	Lake Winnebago	Emerg Migr	816-591-5259	lwkenSmith@comcast.net
	Snodgrass	Jason	Fort Osage R-1 School District	Superintendent	816-650-7005	jsnodgrass@fortosage.net
	Snow	Marc	Grain Valley R-5 School District	Superintendent	816-847-5006	msnow@gvr5.net
	Tarwater	Matthew	Lone Jack C-6 School District	Superintendent	816-697-3539	mtarwater@lonejackc6.net
	Tatum	Lamont	Greenwood	Acting Police Chief		ltatum@greenwoodpd.com
<i>KATL</i>	Taylor	Kara	City of Lee's Summit Public Works	Environmental Specialist	816-969-1800	publicworks@cityoflis.net
	Thomsen	Bryan	Oak Grove R-VI School District	Superintendent	816-690-4156	bthomsen@oakgrove.k12.mo.us
	Walker	Travis	Greenwood	Building/Zoning/Public Works Dir	816-537-6969	twalker@greenwoodmo.com
	Weaver	Levi	Greenwood	Mayor		lweaver@greenwoodmo.com
	Weishaar	Michael	Center School District	Superintendent	816-349-3300	mweishaar@center.k12.mo.us
	Williams	Jeff	Kansas City, MO	Planning & Dev Director		jeffrey.williams@kcmo.org

*Kim Maxey Katie JACOBO Emerg Resp 404 8156*







**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**JACKSON COUNTY  
SEPT. 10, 2019**

**PLANNING MEETING**



1



**MITIGATION PLAN  
EVERY FIVE YEARS**

**LOCAL JURISDICTIONS – Cities, counties,  
school districts, colleges, special districts**

**Mitigation planning is a process to:**

- Identify hazards that pose risk
- Assess the potential impacts
- Develop goals, objectives, and actions
- Set priorities/ implement mitigation actions

2





*Kansas City Regional*

# Hazard Mitigation Plan

## Meetings on the new regional hazard mitigation effort scheduled for December

### Please join us and offer your feedback!

Please join us at one of the December meetings to complete the update of your jurisdiction's part of the region's Hazard Mitigation Plan and consider goals and strategies. This plan is prepared every five years to help cities, counties, school districts, colleges and other local jurisdictions reduce risks from future disaster events by identifying mitigation actions they might take. As a result of their planning, participating jurisdictions are eligible to apply for federal grant funds through the Federal Emergency Management Agency (FEMA).

This second round of two-hour meetings will provide an overview of the capabilities' assessment for the five-county area and discuss possible goals and strategies that cities, counties, school districts, colleges and universities and special districts might choose to include in the plan to reduce risks from the five priority hazards.

### Timeframe

MARC expects to complete the draft plan by the end of the year or early January 2020 and send the draft to the state of Missouri for review. Following the review and with any changes, local jurisdictions will be asked to adopt the plan with their goals and strategies by early April.

### Questions?

Contact Marlene Nagel at 816-701-8218 or [mnagel@marc.org](mailto:mnagel@marc.org) for more information.

### Meeting Dates:

#### **Cass County**

Wednesday, Dec. 18, 2–4 p.m.  
Raymore Riverview  
Community Center  
227 Municipal Circle  
Raymore, Missouri  
**REGISTER**

#### **Clay County**

Monday, Dec. 16, 1–3 p.m.  
Clay County Public Health Center  
800 Haines  
Liberty, Missouri  
**REGISTER**

#### **Jackson County**

Friday, Dec. 13, 9–11 a.m.  
Grandview Community Center  
13500 Byars Road  
Grandview, Missouri  
**REGISTER**

#### **Platte County**

Wednesday, Dec. 11, 9–11 a.m.  
Platte County Resource Center  
11724 N.W. Plaza Circle  
Kansas City, Missouri  
**REGISTER**

#### **Ray County**

Thursday, Dec. 5, 2–4 p.m.  
Ray County Library  
215 E. Lexington Street  
Richmond, Missouri  
**REGISTER**

### Who Should Attend:

Elected officials, emergency managers, public works directors, planners, school personnel and the public are encouraged to attend.

## Marlene Nagel

---

**From:** Nordia Epps  
**Sent:** Monday, December 23, 2019 9:23 AM  
**To:** Marlene Nagel  
**Subject:** Images and Results Please Join Us- December Hazard Mitigation Plan Meeting Dates  
**Attachments:** Ray Dec 5.png; Platte Dec 11.png; Jackson Dec 13.png; Clay Dec 16-Canceled.png; Cass Dec 18.png

Marlene,  
Here are images of the events we posted for the Hazard Mitigation Meetings  
The images also show the people reached and responses, also summarized below.  
Please let me know if I can provide any more information.

	<b>Reach</b>	<b>Responses</b>
Ray	513	3
Platte	316	3
Jackson	271	1
Clay	357	2
Cass	269	1
<b>Total</b>	<b>1726</b>	<b>10</b>

Thanks,

Nordia

**From:** Marlene Nagel <MNAGEL@MARC.ORG>  
**Sent:** Sunday, December 22, 2019 9:26 PM  
**To:** Nordia Epps <nepps@MARC.ORG>  
**Subject:** RE: Please Join Us- December Hazard Mitigation Plan Meeting Dates

Thanks for your help; I might not have a date until next week.

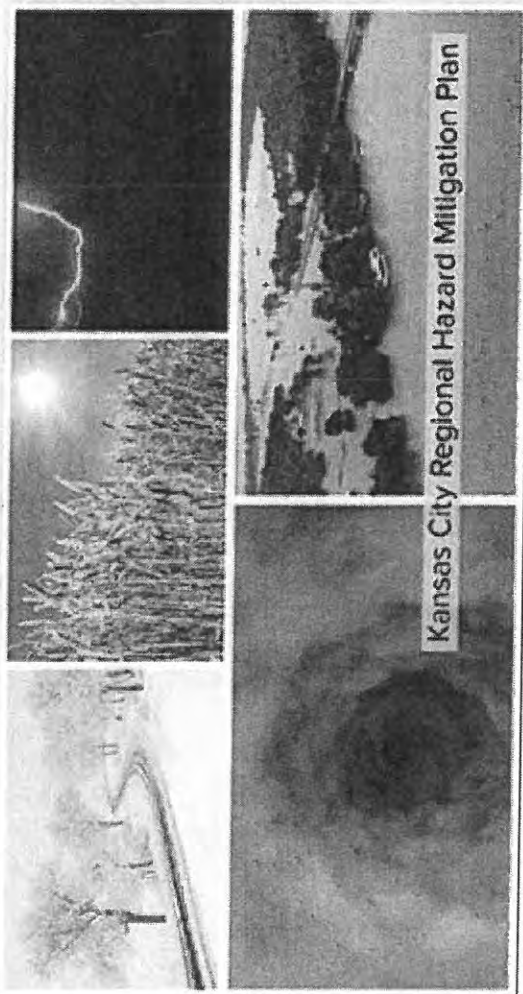
---

**From:** Nordia Epps <nepps@MARC.ORG>  
**Sent:** Sunday, December 22, 2019 8:27 PM  
**To:** Marlene Nagel <MNAGEL@MARC.ORG>  
**Subject:** Re: Please Join Us- December Hazard Mitigation Plan Meeting Dates

Marlene,  
I can send you images and results from the event posts promoting the meetings. Would you send me the new date for the Clay County meeting when it's rescheduled? I can update the event.  
Nordia

Get [Outlook for Android](#)

---



DEC 5 **Ray County Hazard Mitigation Plan**  
Public · Hosted by Mid-America Regional Council

★ Interested ✓ Going Hootlet ...

Thursday, December 5, 2019 at 2 PM – 4 PM  
about 2 weeks ago

Ray County Library  
215 E Lexington St, Richmond, Missouri 64085  
Show Map

About Discussion

INSIGHTS See More

**513**  
People Reached  
+0 last 7 days

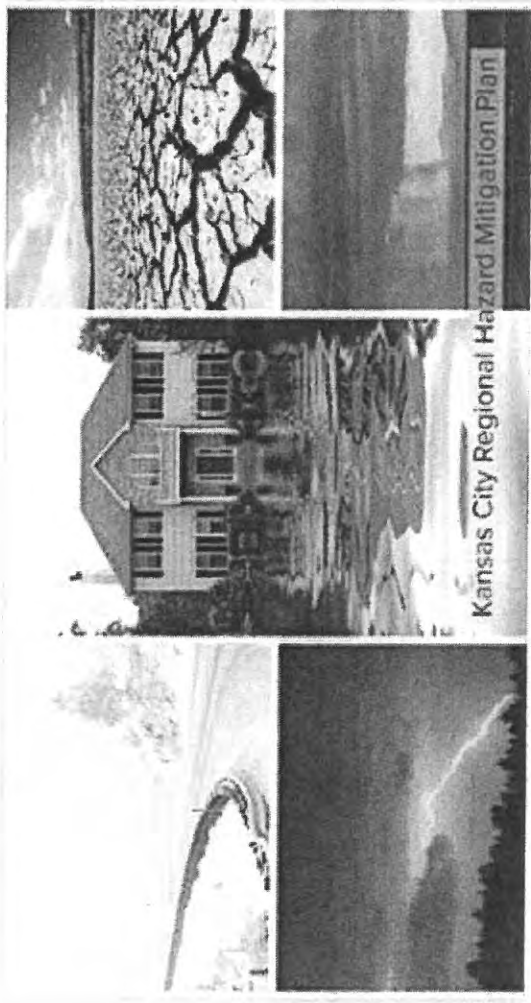
★ **3**  
Responses  
+0 last 7 days

Track ticket sales on your next event by adding a ticket link

Audience  
**Women 35-44**  
23% of total reach

English (US) · Español · Português (Brasil) · Français (France) · Deutsch +

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Facebook © 2019



**DEC 11** **Platte Co. Hazard Mitigation**

Public · Hosted by Mid-America Regional Council

★ Interested ✓ Going

Hootlet ...

🕒 **Wednesday, December 11, 2019 at 9 AM – 11 AM**  
about 1 week ago

📍 **Platte County Resource Center**  
11724 Nw Plaza Cir Ste 200, Kansas City, Missouri 64153

Show Map

About

Discussion

INSIGHTS

See More

**316** People Reached  
+0 last 7 days

**3** Responses  
+0 last 7 days

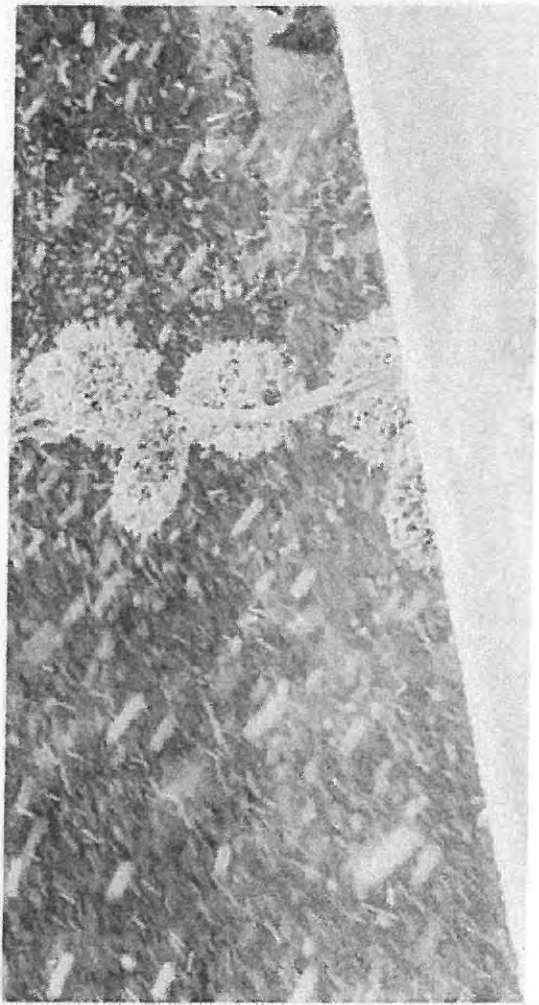
Track ticket sales on your next event by adding a ticket link

Audience  
**Women 35-44**  
24% of total reach

English (US) · Español · Português (Brasil) · Français (France) · Deutsch +

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DEC 13 **Jackson Co. Hazard Mitigation**  
Public · Hosted by Mid-America Regional Council

★ Interested ✓ Going

Hootlet ...

🕒 Friday, December 13, 2019 at 9 AM – 11 AM  
about 1 week ago

📍 Grandview City Community Center  
13500 Byals Rd, Grandview, Missouri 64030

Show Map

About Discussion

INSIGHTS

See More

👤 **271**  
People Reached  
+0 last 7 days

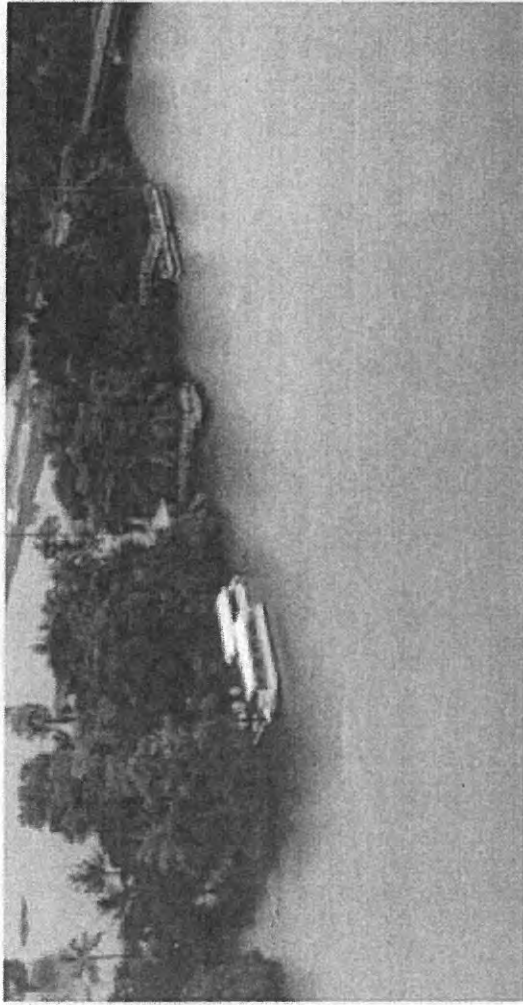
★ **1**  
Responses  
+0 last 7 days

📄 Track ticket sales on your next event by adding a ticket link

Audience  
**Women 35-44**  
24% of total reach

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DEC

16

### Clay Co. Hazard Mitigation

Public · Hosted by Mid-America Regional Council

★ Interested ✓ Going

Hootlet ...

Monday, December 16, 2019 at 1 PM – 3 PM  
6 days ago

Clay County Public Health Center  
800 Haines Dr, Liberty, Missouri 64068

Show Map

#### About

Discussion

Write Post | Add Photo/Video | Live Video | Create Poll

MARC Write something...

#### INSIGHTS

See More

**357**  
People Reached  
+0 last 7 days

**2**  
Responses  
+0 last 7 days

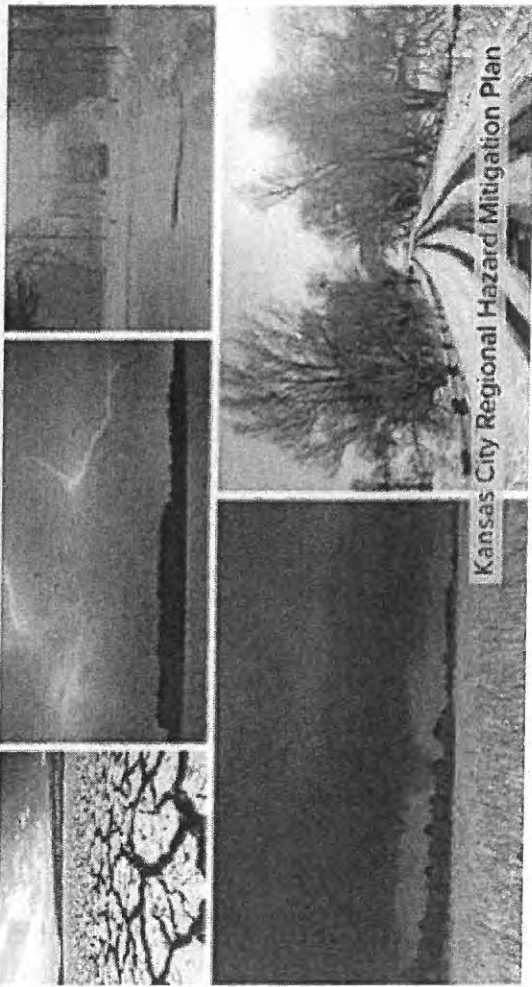
Track ticket sales on your next event by adding a ticket link

Audience  
**Women 35-44**  
23% of total reach

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DEC 18 **Cass Co. Hazard Mitigation**  
Public · Hosted by Mid-America Regional Council

★ Interested ✓ Going Hootlet ...

🕒 Wednesday, December 18, 2019 at 2 PM – 4 PM  
4 days ago

📍 227 Municipal Cir, Raymore, MO 64083, United States Show Map

About Discussion

INSIGHTS

See More

👤 **269**  
People Reached  
+0 last 7 days

★ **1**  
Responses  
+0 last 7 days

📄 Track ticket sales on your next event by adding a ticket link

Audience  
**Women 35-44**  
25% of total reach

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# REGIONAL HAZARD MITIGATION PLAN MEETING

RAY COUNTY – DECEMBER 5, 2019

2 – 4 PM







Ray County Library, Richmond, MO

## AGENDA

1. Welcome/introductions
2. Background/Update on the Hazard Mitigation Plan requirements (FEMA)
3. Status on Planning Process
  - a. Additional information needed from local jurisdictions
  - b. What's next
4. Capability Assessment Update
  - a. Key findings
  - b. Review needed/Small group discussion
5. Goals and Strategies
  - a. What progress/changes to 2015 goals?
  - b. Review of risks and capabilities – ideas for goals?
  - c. Steps to identify and record 2020 goals and strategies
6. Timeframe to complete the plan and seek approval
  - a. Sample resolution
  - b. Review of draft plan – submit to SEMA by February 1, 2020
7. Next steps in our process

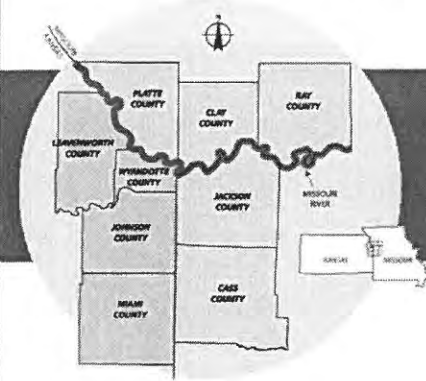


**KC Regional Hazard Mitigation Plan Meeting - Ray County, MO at Ray County Library  
Thursday, December 5, 2019**

Initial if Present	Last Name	First Name	Organization	Email Address	Phone Number
	Archibald	Scott	Orrick R-XI School District	sarchibald@orrick.k12.mo.us	816-770-0094
	Harper	Carl	Ray County Emergency Management	raycoemergency@mediacombb.net	816-848-4500
	Nolker	Matt	City of Lawson, MO	cityadmin@cityoflawsonmo.org	816-580-3217
	Schmitz	Roger	Lawson R-XIV School District	schmitzr@lawsoncardinals.org	816-580-7277
	Summa	Bruce	City of Lawson	201@lawsonpolice.com	816-580-3217
	Sanders	Mark	City of Richmond	MSanders@cityofrichmondmo.org	816-776-2125
	<del>Summa</del>				
	Bob	KING	Ray County		(816) 776-4507




MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN



**RAY COUNTY  
DECEMBER 5, 2019**

PLANNING MEETING



1



MEETING AGENDA

- Welcome/introductions
- Background/Update on the Plan requirements
- Status on Planning Process
- Capability Assessment Update
- Goals and Strategies
- Timeframe to complete the plan and seek approval
- Next steps in our process

2



## **BENEFITS OF ADOPTING A HAZARD MITIGATION PLAN**

- **Enables jurisdictions to assess their risks and vulnerabilities to natural (or man-made) hazards**
- **Enables inter-departmental and inter-disciplinary discussions on hazards and possible mitigation measures**
- **Allows for broad community input**
- **Enables jurisdictions to seek FEMA grants**

3




## **FEMA HAZARD MITIGATION GRANTS**

- **HAZARD MITIGATION GRANT PROGRAM** – After federally declared disaster, funds awarded to state. 20% in MO for mitigation projects. 75% fed 25% local
- **PRE-DISASTER MITIGATION GRANT PROGRAM** – Competitive grant funds available every yr through states. 75% fed 25% local
- **FLOOD MITIGATION GRANT PROGRAM** – Help communities with repetitive flood losses 75%/25% for insured properties & planning grants; 90%/10% for repetitive loss properties; 100% Fed for severe repetitive loss
- **ALL REQUIRE ADOPTED HAZARD MITIGATION PLAN**

4






## 2020 PRIORITIES - NATURAL HAZARDS FOR CONSIDERATION

- Flood-Related Hazards
  - River Flooding
  - Flash Flooding
  - Dam/Levee Failure
- Severe Winter Weather
- Tornadoes/Severe Thunderstorms
- Drought/Extreme Temperatures



5




## ONLINE PROFILE TOOL

### Cities and Counties

- Part I – Hazard Identification -Update the probability and severity of the five priority risks
- Part II – Local Capabilities Assessment (Administrative, Financial; Education and outreach; and planning and regulatory).
- Part III – Safe Growth Audit (How your community supports or could accommodate future growth).
- Part IV – Participation in National Flood Insurance Program

2/28/2020


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## ONLINE PROFILE TOOL SCHOOL DISTRICTS/COLLEGES

- Part I – Hazard Identification (Assign a probability and severity for each priority risks – describe past events).
- Part II – Plans– Identify any plans or policies that could prevent or reduce the impacts.
- Part III – Mitigation Activities – Identify mitigation activities that your district may have taken over the past 5 years.
- Part IV – FEMA Grants – describe any grants you have applied for or received during the past 5 years.
- Part V – Technical Documents – Y/N has your district reviewed the state hazard mitigation plan?

7




## PROFILE UPDATE ONLINE TOOL



**MARC**  
Metropolitan Area Regional Council

**2020 Regional Multi-Hazard Mitigation Plan**  
**Community/School Profile**



### 2020 Community/School Profile

The USA-America Regional Council is updating the 2015 Regional Multi-Hazard Mitigation Plan to assist cities, counties, school districts, colleges and universities and other special districts on the Missouri side of the Kansas City metro area.

The plan is important for local jurisdictions to identify hazards that pose a greater risk to lives and property, and to outline actions that could be taken to mitigate those risks. Adoption of the plan enables the local jurisdictions to be eligible to apply for certain FEMA grants.

To become an eligible signatory to the 2020 Plan, each jurisdiction must participate in the planning process, provide important information for the plan and identify action steps that the local jurisdiction is willing to take over the next five years.

Please complete the profile by **September 3, 2019**. Thank you for your participation.

Questions: Marlene Nagel [mnagel@marc.org](mailto:mnagel@marc.org)

Create New User
Log In To Account

#### INSTRUCTIONS & TIPS

- To get started, click on Create New User button, or
- If you have your credentials from the 2015 plan application, click the Log In to Account button.
  - Your 2015 information will pre-populate the application.
- If you want a reference copy of your 2015 profile, go immediately to the Summary page and click on the Print Page button before you fill out the application with your 2020 update.
- When your 2020 profile is complete, from the Summary page click the Print Page button to print or PDF a copy for your internal records.

600 Broadway, Suite 200  
Kansas City, MO 64105  
(816)474-4240  
Fax 816-421-2758

MARC programs that receive federal funding may not discriminate against anyone on the basis of race, color, or national origin, according to Title VI of the Civil Rights Act of 1964.  
Title VI email: [discrimination@metropolitanarea.org](mailto:discrimination@metropolitanarea.org)  
Questions? Contact Marlene Nagel at [mnagel@marc.org](mailto:mnagel@marc.org)

2/28/2020

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**GOALS & ACTIONS UPDATE ONLINE TOOL**

**MARC** 2020 Regional Multi-Hazard Mitigation Plan

Save Goals

Please review your 2015 Goals and Actions listed below and update the status and explanation as appropriate. Then click the Save Goals button at the top.

**Mid-America Regional Council**

**Tomadoes:**

**Goal: Increase public awareness and understanding the benefits of "safe rooms."**

Action	Status	Explanation of Status
Develop specific informational messages in both years.	Delayed	Delayed
Partner in outreach to conduct safe room education.	Delayed	Delayed until further resources available in 2020.

**Goal: Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/rain hazards.**

Action	Status	Explanation of Status
Review existing facilities for shelter suitability, make changes and make modifications as needed.	Completed	Finalized a grant application (2019) that covered costs of the project (i.e. utility relocation, roof replacement, foundation and landscaping work).
Partner in efforts to bring public facilities into compliance with codes and regulations.	Ongoing	Partner in efforts to bring public facilities into compliance with codes and regulations.
Conduct ongoing sector meeting/review of safe room status in ongoing new public facility construction.	Ongoing	Partner in efforts to conduct ongoing meeting/review of safe room status in ongoing new public facility construction.

2/28/2020

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**TYPES OF MITIGATION STRATEGIES**

- Public education and awareness
- Local plans and regulations
- Natural systems protection
- Structures and infrastructure

10



## MITIGATION MEASURES TO CONSIDER - TORNADOES

- Promote the construction of safe rooms or shelters in schools, child care centers or nursing homes homes and mobile home parks public parks, particularly large sporting complexes

2/28/2020

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## MITIGATION MEASURES TO CONSIDER - TORNADOES

- Require wind engineering measures and construction techniques
- Adopt Residential Building Codes for high wind regions
- Education and Awareness Programs – conduct drills, teach safety precautions, support severe weather awareness, promote use of NOAA weather radios

2/28/2020

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### MITIGATION MEASURES TO CONSIDER – LIGHTNING AND HAIL

- Protect critical facilities and equipment with lightning protection devices
- Promote awareness of lightning and hail dangers and post warnings at outdoor park and recreation facilities
- Minimize hail damage in new construction

2/28/2020

13



### MITIGATION MEASURES TO CONSIDER – SEVERE WIND

- Protect power lines and infrastructure with tree pruning, anchor systems, bury power lines, install redundancy, etc.
- Review wind hazards for your facilities to identify and address at-risk structures
- Promote site and building design standards to minimize wind damage
- Adopt and enforce high wind building codes

2/28/2020

14





## MITIGATION MEASURES TO CONSIDER – SEVERE WINTER WEATHER

- Adopt building codes to include roof snow loads and discourage flat roof construction
- Lessen roadway impacts using snow fences to reduce blowing snow
- Conduct winter weather risk awareness activities
- Identify and assist vulnerable populations to remain in their homes or at heating centers

15



## MITIGATION MEASURES TO CONSIDER – DROUGHT

- Develop drought emergency plan to include criteria for drought-related actions and to inform the public
- Monitor drought conditions and water supply and have plans to take actions as necessary
- Consider mandatory water conservation measures during drought emergencies for non-essential uses
- Improve water supply and delivery systems to save water
- Encourage use of drought-tolerant landscape design
- Educate residents on water saving techniques and farmers on conservation practices

16



## MITIGATION MEASURES TO CONSIDER – EXTREME TEMPERATURES

- Reduce Urban Heat Island through tree and other vegetation plantings
- Educate the public on impacts of extreme temperatures on public health
- Assist vulnerable populations with heating or cooling centers, encourage utilities to provide assistance
- Educate property owners about freezing pipes

2/28/2020

17



## MITIGATION MEASURES TO CONSIDER - FLOODING

- Incorporate flood mitigation into local planning
- Limit or restrict development in flood prone areas
- Adopt a stream buffer (or setback) ordinance
- Establish a green infrastructure program to expand green spaces to absorb rain water
- Improve stormwater management planning and adopt policies to reduce runoff

2/28/2020

18



## HAZARD MEASURES TO CONSIDER – FLOOD (CONTINUED)

- Participate in Community Rating System
- Establish local funding for flood mitigation
- Remove existing structures from flood hazard areas
- Improve stormwater drainage system capacity
- Protect infrastructure and critical facilities
- Increase public awareness of flood risks

2/28/2020

19



## HAZARD MITIGATION WEBSITE

Website that will help participants understand the hazards, identify potential risks, assist with assessing impact and tracking goals and actions.

2/28/2020

20





## NEXT STEPS IN PLANNING PROCESS

- Complete regional profile using local information
- Discuss possible hazard mitigation strategies with local jurisdictions at second round public meetings in early Nov
- Draft plan for review by end of year
- Seek adoption of plan by local jurisdictions in March
- Submit to state and FEMA by May 1, 2020

21

## QUESTIONS?

Marlene Nagel [mnagel@marc.org](mailto:mnagel@marc.org)

Jay Heermann, [jheermann@marc.org](mailto:jheermann@marc.org)

Tim Victor, [tvictor@marc.org](mailto:tvictor@marc.org)

816/474-4240

2/28/2020

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# **REGIONAL HAZARD MITIGATION PLAN MEETING**

**CASS COUNTY – DECEMBER 18, 2019**

**2 pm – 4 pm**

**Raymore Community Center, Raymore, MO**

## **AGENDA**

1. Welcome/introductions
2. Background/Update on the Hazard Mitigation Plan requirements (FEMA)
3. Status on Planning Process
  - a. Additional information needed from local jurisdictions
  - b. What's next
4. Capability Assessment Update
  - a. Key findings
  - b. Review needed/Small group discussion
5. Goals and Strategies
  - a. What progress/changes to 2015 goals?
  - b. Review of risks and capabilities – ideas for goals?
  - c. Steps to identify and record 2020 goals and strategies
6. Timeframe to complete the plan and seek approval
  - a. Sample resolution
  - b. Review of draft plan – submit to SEMA by February 1, 2020
7. Next steps in our process




**Hazard Mitigation Plan- Cass County, MO at Raymore Riverview Community Center  
Wednesday, December 18, 2019**

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Austin	Lewis	City of Grandview - Fire Dept.	LAustin@grandview.org	816-316-4961
	Eggers	Jason	Harrisonville School District	jason.eggers@harrisonvilleschools.org	816-380-2727
	Fisher	Bruce	Blue Valley Public Safety / Cass County Emergency Management	bruce@bvpsonline.com	800-288-5120
	Henderson	Stuart	Belton School District #124	dhenderson@bsd124.org	8164897000
	Hufford	Billie	City of Grandview - Community Development	bhufford@grandview.org	816-316-4823
	Nelson	Victoria	City of Lee's Summit	victoria.nelson@cityofs.net	816-969-1600
	Crane	Justin	Cass County Emergency Management	emergency.management@cassmosheriff.org	816-807-4168
	Davis	Lt. Dan	Belton Police Department	ddavis@beltonpd.org	(816) 331-1500
	Nagel	Markene	MARC	mnagel@marc.org	8167018218
	Gress	David	City of Raymore	dgress@raymore.com	
	Groppe	Shelby	City of Peculiar	shelby@groppehill.com	816 813-9425
	Brooks	Ron	City of Peculiar	brooks@cityofpeculiar.com	(816) 779-2228
	Graham	Ron	Grandview Fire	rgraham@grandview.org	816-457-0191

Hazard Mitigation Plan- Cass County, MO at Raymore Riverview Community Center  
Wednesday, December 18, 2019


Initial if Present	Last Name	First Name	Organization	Email	Phone

# MID-AMERICA REGIONAL COUNCIL HAZARD MITIGATION PLAN




**CASS COUNTY  
DECEMBER 18, 2019**

**PLANNING MEETING**



1



## MEETING AGENDA

- Welcome/introductions
- Background/Update on the Plan requirements
- Status on Planning Process
- Capability Assessment Update
- Goals and Strategies
- Timeframe to complete the plan and seek approval
- Next steps in our process

2





# REGIONAL HAZARD MITIGATION PLAN MEETING

CLAY COUNTY – JANUARY 8, 2020

1:30 PM TO 3 PM

Clay County Public Health Center, Liberty, MO



## AGENDA

1. Welcome/introductions
2. Background/Update on the Hazard Mitigation Plan requirements (FEMA)
3. Status on Planning Process
  - a. Additional information needed from local jurisdictions
  - b. What's next
4. Capability Assessment Update
  - a. Key findings
  - b. Review needed/Small group discussion
5. Goals and Strategies
  - a. What progress/changes to 2015 goals?
  - b. Review of risks and capabilities – ideas for goals?
  - c. Steps to identify and record 2020 goals and strategies
6. Timeframe to complete the plan and seek approval
  - a. Sample resolution
  - b. Review of draft plan – submit to SEMA by February 15, 2020
7. Next steps in our process



KC Regional Hazard Mitigation Plan Meeting- Clay County, MO at Clay County Public Health Center

Wednesday, January 8, 2020 1:00 PM - 3:00 PM

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Bazzano	Jon	Clay County - Sheriff's Office - EM	jbazzano@sheriffclayco.com	816-407-3732
	Brady	Jon	North Kansas City School District	jon.brady@nkschools.org	816-413-5088
	Daugherty	Sean	Gladstone EM	seand@gladstone.mo.us	816-423-4080
	Evans	Melissa	Clay County - Emergency Management	mevans@sheriffclayco.com	816-407-3730 3730
	Krueger	Wayne	Smithville School District	kruegerw@smithville.k12.mo.us	816-532-0406
	Lockridge	Jason	City of Smithville - Police Department	jlockridge@smithvillemo.org	816-532-0500
	Masoner	Kimberly	Excelsior Springs City Hospital	kmasoner@esmc.org	8168633945
	Mauer	Matt	Kansas City, MO	matt.mauer@kcmo.org	816-513-
	Miles	Eric	Claycomo Fire Department	ericmiles@claycomo.org	816-452-4612
	Mills	John	City of Liberty - Fire Department	jmills@libertymo.gov	816-792-6005

KC Regional Hazard Mitigation Plan Meeting- Clay County, MO at Clay County Public Health Center

Wednesday, January 8, 2020 1:00 PM - 3:00 PM

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Nakahodo	Kim	City of North Kansas City	knakahodo@nkc.org	816-412-7814
	Nolker	Matt	City of Lawson	cityadmin@cityoflawsonmo.org	
Def	Pavlich	David	City of Kearney	dpavlich@kearneymo.us	816-628-4142
	Schmitz	Roger	Lawson School District		
WT	Tarama	Wennekota	Clay County Public Health Center	wtarama@clayhealth.com	816-595-4254
QuT	Tomlinson	Jaret	Excelsior Springs School District	jtomlinson@ga.essd40.com	8166309200
	Tribble	Paul	Excelsior Springs Fire	ptribble@esfire.org	816-630-3000
	Walker	Gene	Fishing River FPD	hotspotfirewalker@yahoo.com	816-628-4191
	Festgen	Laure	FEMA	laure.l.bestonefema.dhs.gov	202-705-5573
	Harcos	DAVE	NORTH KANSAS CITY	dharco@nkc.org	816-241-6025

KC Regional Hazard Mitigation Plan Meeting- Clay County, MO at Clay County Public Health Center

Wednesday, January 8, 2020 1:00 PM - 3:00 PM

Initial if Present	Last Name	First Name	Organization	Email	Phone
WHA	AKIN	WELL	CCSO/EM	wakin@sheriffclayco. com	816-407-3739
CC	Caveney	Christopher	Public	ccaveney@ato.edu	870-623-7364
AB	breer	Aly	KCMO OEM	allison.breer@kcmo.org	816-513-8600



KC Regional Hazard Mitigation Plan Meeting- Clay County, MO at Clay County Public Health Center

Wednesday, January 8, 2020 1:30 PM - 3:00 PM

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Bazzano	Jon	Clay County - Sheriff's Office - EM	jbazzano@sheriffclayco.com	816-407-3732
	Brady	Jon	North Kansas City School District	jon.brady@nkschools.org	816-413-5088
	Daugherty	Sean	Gladstone EM	seand@gladstone.mo.us	816-423-4080
	Evans	Melissa	Clay County - Emergency Management	mevans@sheriffclayco.com	816-407-3739
	Krueger	Wayne	Smithville School District	kruegerw@smithville.k12.mo.us	816-532-0406
	Lockridge	Jason	City of Smithville - Police Department	jlockridge@smithvillemo.org	816-532-0500
	Masoner	Kimberly	Excelsior Springs City Hospital	kmasoner@esmco.org	8168633945
	Mauer	Matt	Kansas City, MO	matt.mauer@kcsmo.org	816-513-
	Miles	Eric	Claycomo Fire Department	ericmiles@claycomo.org	816-452-4612
	Mills	John	City of Liberty - Fire Department	jmills@libertymo.gov	816-792-6005

KC Regional Hazard Mitigation Plan Meeting- Clay County, MO at Clay County Public Health Center

Wednesday, January 8, 2020 1:30 PM - 3:00 PM

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Nakahodo	Kim	City of North Kansas City	knakahodo@nkc.org	816-412-7814
	Nolker	Matt	City of Lawson	<a href="mailto:cityadmin@cityoflawsonmo.org">cityadmin@cityoflawsonmo.org</a>	
	Pavlich	David	City of Kearney	dpavlich@kearneymo.us	816-628-4142
	Schmitz	Roger	Lawson School District		
	Tarama	Wennekota	Clay County Public Health Center	wtarama@clayhealth.com	816-595-4254
	Tomlinson	Jaret	Excelsior Springs School District	jtomlinson@ga.essd40.com	8166309200
	Tribble	Paul	Excelsior Springs Fire	ptribble@esfire.org	816-630-3000
	Walker	Gene	Fishing River FPD	<a href="mailto:hotspotfirewalker@yahoo.com">hotspotfirewalker@yahoo.com</a>	816-628-4191



**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**CLAY COUNTY  
JANUARY 8 , 2020**

**PLANNING MEETING**



1



**MEETING AGENDA**

- Welcome/introductions
- Background/Update on the Plan requirements
- Status on Planning Process
- Capability Assessment Update
- Goals and Strategies
- Timeframe to complete the plan and seek approval
- Next steps in our process

2



# **REGIONAL HAZARD MITIGATION PLAN MEETING**

**PLATTE COUNTY – DECEMBER 11, 2019**

**9 AM – 11 AM**








**Platte County Resource Center, Kansas City, MO**

## **AGENDA**

1. Welcome/introductions
2. Background/Update on the Hazard Mitigation Plan requirements (FEMA)
3. Status on Planning Process
  - a. Additional information needed from local jurisdictions
  - b. What's next
4. Capability Assessment Update
  - a. Key findings
  - b. Review needed/Small group discussion
5. Goals and Strategies
  - a. What progress/changes to 2015 goals?
  - b. Review of risks and capabilities – ideas for goals?
  - c. Steps to identify and record 2020 goals and strategies
6. Timeframe to complete the plan and seek approval
  - a. Sample resolution
  - b. Review of draft plan – submit to SEMA by February 1, 2020
7. Next steps in our process



**KC Regional Hazard Mitigation Plan Meeting- Platte County, MO  
Wednesday, December 11, 2019**

Initial if Present	Last Name	First Name	Organization	Email	Number
	Cantu	Gale	Platte County - Planning & Zoning Dept.	gcantu@co.platte.mo.us	816-858-3380
	Carroll	Christopher	Kansas City, Missouri Office of Emergency Management	christopher.carroll@kcmo.org	8165138603
	Clark	Kelly	Northmoor, City of	kclark@northmoorpd.com	8167413960
	Jordan	Jon	City of Parkville - Police Department	jjordan@parkvillemo.gov	816-741-4454
	Libby	Jeff	Lake Waukomis	jalibby1956@gmail.com	8168636987
	O'Neal	Michael	Platte County - Sheriff's Office	michael.oneal@plattesheriff.org	816-858-1966
	Rowden	Julie	City of Northmoor	rowdycitynorthmoor@yahoo.com	816-741-6071
	Schmitz	Roger	Lawson R-XIV School District	schmitzr@lawsoncardinals.org	816-580-7277
	AVERY	ANTHONY	Platte Co: Sheriff's Office	Anthony.Avery@ Platte County. org	816-858-3361




**KC Regional Hazard Mitigation Plan Meeting- Platte County, MO  
Wednesday, December 11, 2019**

Initial if Present	Last Name	First Name	Organization	Email	Number
MJ	Nagel	Mark	MARC	m.nagel@mare.org	
PS	STURMIA	PETE	PLATTE CO. SURVEY OFFICE	PETE.STURMIA@SIFBUREAU.MO	
BT	HEIM	TOM	PLATTE CO. PUBLIC RELATIONS	bt Heim@co.platte.mo.us	
DR	ERICKSON	Daniel	Platte Co. PZ	derickson@co.platte.mo.us	3365
RS	Schmitz	Roger	Lawson School District	schmitzr@lawsoncardinals.org	816 580 7077
CP	Phillips	Chad	Park Hill School Dist.	phillips@parkhill.k12.mo.us	






**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**PLATTE COUNTY  
DECEMBER 11, 2019**

**PLANNING MEETING**



1



**MEETING AGENDA**

- Welcome/introductions
- Background/Update on the Plan requirements
- Status on Planning Process
- Capability Assessment Update
- Goals and Strategies
- Timeframe to complete the plan and seek approval
- Next steps in our process

2



# **REGIONAL HAZARD MITIGATION PLAN MEETING**

**JACKSON COUNTY – DECEMBER 13, 2019**

**9 AM – 11 AM**

**Grandview Community Center, Grandview, MO**

## **AGENDA**

1. Welcome/introductions
2. Background/Update on the Hazard Mitigation Plan requirements (FEMA)
3. Status on Planning Process
  - a. Additional information needed from local jurisdictions
  - b. What's next
4. Capability Assessment Update
  - a. Key findings
  - b. Review needed/Small group discussion
5. Goals and Strategies
  - a. What progress/changes to 2015 goals?
  - b. Review of risks and capabilities – ideas for goals?
  - c. Steps to identify and record 2020 goals and strategies
6. Timeframe to complete the plan and seek approval
  - a. Sample resolution
  - b. Review of draft plan – submit to SEMA by February 1, 2020
7. Next steps in our process



# KC Regional Hazard Mitigation - Jackson County, MO Grandview Community Center

Friday, December 13, 2019

Initial if Present	Last Name	First Name	Organization	Email	Phone
	Boatright	Leslie (Les)	Central Jackson County Emergency Management	lboatright@cjcfd.org	816-223-7507
	Carroll	Christopher	Kansas City, Missouri Office of Emergency Management	christopher.carroll@kcmo.org	8165138603
	Cole	Thomas	City of Blue Springs	tcole@bluespringsgov.com	8166740789
	Harper	Dyon	City of Raytown - Police Department	harperd@raytownpolice.org	8167376104
	Mallon	Mike	City of Blue Springs - Community Development	mmallon@bluespringsgov.com	816-228-0124
	Manley	Dan	City of Lee's Summit - Fire Department	dan.manley@cityoffs.net	816-969-1304
	Maxey	Katie	Jackson County Health Department	katie.maxey@tmcmed.org	816-404-8136
	McCall	Matthew	City of Grandview - Police Department	mmccall@grandview.org	816-316-4922
	Miller	Dawn	<del>THHHH</del> KCOAD Exec. Sec. MR. KC Sec.	dawndmiller@gmail.com	<del>816-394-1653</del> 816-920-1952
	Nelson	Victoria	City of Lee's Summit	victoria.nelson@cityoffs.net	816-969-1600
	Person	James	City of Belton - Police Department	jperson@beltonpd.org	816-331-5522
	Roberts	Cheri	City of Greenwood	croberts@greenwoodmo.com	816-537-6969
	Sherwood	Chris	City of Blue Springs	csandie@bluespringsgov.com	816-228-0115
	Sherwood	Mark	City of Oak Grove - Sni Valley Emergency Management	msherwood@cityfoakgrove.com	816-690-3773

KD

Rubney Keith City of Grandview

Kdabueya@grandview.com

(816) 316-4825



**MID-AMERICA REGIONAL COUNCIL  
HAZARD MITIGATION PLAN**



**JACKSON COUNTY  
DECEMBER 13, 2019**

**PLANNING MEETING**

**MARC**  
MID-AMERICA REGIONAL COUNCIL

1



**MEETING AGENDA**

- Welcome/introductions
- Background/Update on the Plan requirements
- Status on Planning Process
- Capability Assessment Update
- Goals and Strategies
- Timeframe to complete the plan and seek approval
- Next steps in our process

2





City of Kansas City, MO Hazard Mitigation Planning Meetings

date	start time	end time	hours	participants	Dept./Organization	activity
8/22/2019	14:00	14:10	0.17	Chris Carroll (EM)	MARC	planning meeting
9/10/2019	13:00	15:00	2.00	Chris Carroll (EM)	MARC	planning meeting
10/1/2019	9:00	10:00	1.00	Chris Carroll (EM) Tim Gridley (PH Emergency Planner) Steven Lammers (PH Emergency Planner)	KCMO OEM Health Dept. Health Dept.	planning meeting
10/1/2019	13:00	14:00	1.00	Chris Carroll (EM) Lezley Mix (Asst. Airport Mgr) Melissa Cooper (Airport Mgr)	KCMO OEM Aviation - Wheeler Aviation - Wheeler	planning meeting
10/2/2019	13:00	15:00	2.00	Chris Carroll (EM) James Walton (Stormwater Engineer)	KCMO OEM Water Services	planning meeting
10/21/2019	13:00	15:00	2.00	Chris Carroll (EM) Brad Deichler (Major) Mark Folsom (Major) Robert Koehl (Deputy Chief)	KCMO OEM KCPD KCPD KCPD	planning meeting
10/23/2019	9:00	11:00	2.00	Chris Carroll (EM) Andrew Bracker (Development Specialist Brownfields Coordinator)	KCMO OEM City Planning and Development	planning meeting
10/25/2019	8:30	10:30	2.00	Chris Carroll (EM) Tristan Laughlin (Environmental Officer) Andrew Savastino (Chief Environmental Officer)	KCMO OEM Office of Environmental Quality Office of Environmental Quality	planning meeting
10/28/2019	13:00	15:00	2.00	Chris Carroll (EM) Peter Knudsen (BC) Mark Mauer (Asst. Chief) John Hastings (Asst. Fire Chief)	KCMO OEM KCFD KCFD KCFD	planning meeting
11/4/2019	10:00	12:00	2.00	Chris Carroll (EM) David Evans (IT Director) Brandon Hays (IT Specialist)	KCMO OEM General Services - IT Division General Services - IT Division	planning meeting
11/12/2019	9:00	11:00	2.00	Chris Carroll (EM) Ray Herzog (Code Enforcement Supervisor) Tom Neff (Environmental Review Officer)	KCMO OEM Neighborhood & Housing Services Neighborhood & Housing Services	planning meeting
11/13/2019	13:00	15:00	2.00	Chris Carroll (EM) Esther Swanson (Special Projects Mgr) Kevin Evans (Superintendent of Parks) Teresa Rynard (Director Parks)	KCMO OEM Parks & Recreation Parks & Recreation Parks & Recreation	planning meeting
11/15/2019	13:00	15:00	2.00	Chris Carroll (EM) James Connelly (Emergency Manager) Chris Lockey (Fiber Specialist) Steve Bean (Technology Coordinator)	KCMO OEM KCMO OEM KCMO OEM KCMO OEM	planning meeting
12/9/2019	9:00	11:00	2.00	Chris Carroll (EM) Scott Glaeser (Security Manager) Brandon Iliolo (Energy Manager) James Freed (City Architect)	KCMO OEM General Services General Services General Services	planning meeting
12/9/2019	13:00	15:00	2.00	Chris Carroll (EM) James Walton (Airport PD Sgt) Charles McMullin (Airport PD Lt) Bill Simpson (A/Chief; KCI Airport) Matt Mauer (BC KCFD, AARF) Jacob Spain (AirOps Agent) Bob Tempeselli (AirOps Aviation Mgr) Seth Smith (Field Mx Mgr) Bob Johnson (AirOps Mgr) Aaron Wright (Asst AirOps Mgr)	KCMO OEM Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI Aviation - KCI	planning meeting
12/11/2019	9:00	11:00	2.00	Chris Carroll (EM) Brandon Kowalke (Cookingham Fellowship - intern) Diane Binckley (CPD Director)	KCMO OEM City Planning and Development City Planning and Development	planning meeting

City of Kansas City, MO Hazard Mitigation Planning Meetings

date	start time	end time	hours	participants	Dept./Organization	activity
				Greg Franzen (Asst. Director)	City Planning and Development	
12/13/2019	14:00	16:00	2.00	Chris Carroll (EM) Wei Sun (Traffic Engineer) David Miller (City Engineer) Eric Falk (Bridge Maint. Engineer) Jason Waldron (Assoc. Director of Multimodal Transportation)	KCMO OEM Public Works Public Works Public Works Public Works	planning meeting

<b>Lee's Summit, MO Meetings</b>			
<b>Meeting Title</b>	<b>Date</b>	<b>Agenda/Information Covered</b>	<b>Stakeholders in Attendance</b>
MARC Hazard Mitigation Kickoff	April 2, 2019	Marc Hazard Mitigation Kickoff Meeting	Public and Staff
Little Blue River Basin	July 15, 2019	Little Blue River Basin discussion between USACE, KCMO and various regional communities	Staff
Flood Plain Management Course	July 17, 2019 July 18, 2019	SEMA's Tools of Flood Plain Management Course	Staff
Discussion	July 22, 2019	Discussed Timbercreek Flood Plain issues	Staff Residents
Exam - Certified Flood Plain Manager	August 5, 2019	Certified Flood Plain Manager Exam taken by (and passed) Public Works Staff Member.	Public Works Staff Member
Staff Meeting	August 19, 2019	Assess Recent Flooded Properties	Staff
Staff Meeting	August 30, 2019	Staff Hazard Mitigation meeting	Staff
Staff Meeting	September 6, 2019	Discussed Flood Plain layer(s) in GIS	Staff
MARC Hazard Mitigation Meeting	September 10, 2019	Regional MARC Hazard Mitigation Meeting	Public and Staff

Staff Meeting	September 18, 2019	Discuss direct connection to storm pipes to reduce flooding	Staff
Staff Review	October 31, 2019	Review Emergency Management requirements for APWA Accreditation	Staff
Community Assistance Visit (CAV)	November 5, 2019	SEMA performed a Community Assistance Visit	SEMA staff Staff
Staff Meeting	December 10, 2019	Discuss direct connection to storm pipes to reduce flooding	Staff

# ARCHIE R-V SCHOOL DISTRICT



302 W. State Rt. A. Archie, Missouri 64725

[www.archie.k12.mo.us](http://www.archie.k12.mo.us)

816-293-5312 ~ 816-293-5641 Fax

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Marlene Nagel,

Thank you for all of your hard work in getting this information to all those who need it. I personally appreciate the efforts that you have gone to in designating the timeline and needed artifacts for the plan. You have aided greatly in the process. I would like to formally indicate that I am the Lead Contact for the District regarding the Hazard Mitigation Plan.

We have reviewed all documents relating to the Hazard Mitigation Plan. In regards to the Capabilities Assessment, all designations still apply. As we discussed, the only area that we feel the District may be able to enhance, would be under the heading of “Infectious Disease”. We considered this addition because we have added training and materials to our all-staff professional development trainings. Along with these trainings, we have been gifted through a third party grant, blood spill kits for all staff as well as a wall mounted cabinet containing supplies to effectively contain and clean bodily fluid and blood spill episodes that occur in the main areas of the school building. As you and I discussed, we are not adding that to the Capabilities Assessment at this time due to our belief that it does not meet the standard required.

Additionally, we have reviewed our goals and although there are only two goals under “Tornados”, we feel that they are goals that are broad reaching in regards to all severe weather. The two goals address preventative measures that can be taken to mitigate hazards associated with severe weather as well as the emphasis on the importance for planning in the home and in the school setting. If the District were to add any other goals, they would be added in the area of “Flooding”. This would be in response to a consistent issue/concern in the Archie R-V District as it relates to flooding. Those goals would mimic the two goals already listed; they would just now be in multiple categories. For that reason, I would not add any additional goals at this time.

We have met as an administrative staff on multiple occasions regarding the Hazard Mitigation Plan. The dates of the meetings and topics are as follows:

- 12-03-2019 - Administrative Staff (Mr. Kramer – Superintendent, Lee Harmon – Special Programs Director, Tamara Silvey – Elementary Principal, and Coy Dalton – High School Principal) met and discussed/reviewed the 2020 Regional Multi-Hazard Mitigation Plan. Areas of highlight were Goals and Capabilities Assessment.
- 01-09-2020 - Administrative Staff (Mr. Kramer – Superintendent, Lee Harmon – Special Programs Director, Tamara Silvey – Elementary Principal, and Coy Dalton – High School Principal) met and discussed/reviewed the 2020 Regional Multi-Hazard Mitigation Plan. Areas of highlight were Goals and Capabilities Assessment.

# ARCHIE R-V SCHOOL DISTRICT



302 W. State Rt. A. Archie, Missouri 64725

[www.archie.k12.mo.us](http://www.archie.k12.mo.us)

816-293-5312 ~ 816-293-5641 Fax

- 01-21-2020 - Administrative Staff (Mr. Kramer – Superintendent, Lee Harmon – Special Programs Director, Tamara Silvey – Elementary Principal, and Coy Dalton – High School Principal) met and finalized the information for the 2020 Regional Multi-Hazard Mitigation Plan. Areas addressed were information contained in Goals and Capabilities Assessment.

Don't hesitate to reach out to me should you need any other information or assistance.  
Sincerely,

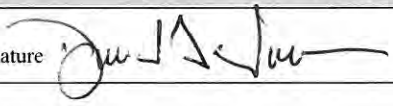
Jeffrey Kramer  
Superintendent, (816)293-5312 ext. 103  
Archie R-V school District

**Memorandum of Agreement**  
**Binding the SEMA & the Consultant**  
*For*  
**Professional Planning Services**  
(FEMA-DR-MO-4317-0002)  
(CFDA 97.039)

**TITLE OF PLAN:** Kansas City Regional **MULTI-JURISDICTIONAL HAZARD MITIGATION**  
**PLAN** (Name of Region, County or City)

*The Missouri State Emergency Management Agency (hereinafter referred to as "SEMA") & the Mid-America Regional Council (hereinafter referred to as "Consultant") hereby declare understanding, agreement and certification of compliance to provide the services, at the prices quoted, in accordance with all requirements and specifications contained herein. In witness, whereof the parties hereto have made and executed this Agreement as of the month, day and year as written below.*

SEMA HEREBY AGREES		
Authorized Signature	Date	
Printed Name Ernie Rhodes	Title SEMA Director	
Missouri State Emergency Management Agency (SEMA)		
Mailing Address P.O. Box 116		
City, State, Zip Jefferson City, MO 65102		
Phone Number (573) 526-9143	Fax Number (573) 526-9198	E-mail Address: Ernie.Rhodes@sema.dps.mo.gov

THE CONSULTANT HEREBY AGREES		
Authorized Signature 	Date: 9/12/18	
Printed Name : David A. Warm	Title : Executive Director	
Consultant Organizational Name : Mid-America Regional Council		
Mailing Address: 600 Broadway, Suite 200		
City, State, Zip : Kansas City, MO 64105		
		Federal Employer ID No.: 43-0976432
Phone Number : 816/474-4240	Fax Number : 816/421-7758	E-mail Address: dwarm@marc.org

***By affixing signatures to this document, both parties affirm that this Agreement is a legally binding document. SEMA and the Consultant thus each binds him/herself and his/her partners, successors, executors, administrators, assigns and legal representatives to other party to this Agreement and to the partners, successors, executors, administrators, assigns and legal representatives of such other party, in respect to all covenants, agreements and obligations to this Agreement and Exhibits A, B, C and D and any subsequently related Change Orders.***

## 1. AGREEMENT REQUIREMENTS

### 1.1 GENERAL REQUIREMENTS

- 1.1.1 The Consultant agrees that the **Kansas City Regional Multi-Jurisdictional Hazard Mitigation Plan** (See Exhibit C for list of participating jurisdictions), hereinafter referred to as “Local Government,” must meet the requirements of the *The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988* (as amended by the Disaster Mitigation Act of 2000, P.L. 106-390), Federal Emergency Management Agency (“FEMA”) guidance at 44 CFR Part 201 – *Mitigation Planning* and 44 CFR Part 206, Subpart N, – *Federal Disaster Assistance, Hazard Mitigation Grant Program*, and FEMA final rules: *Hazard Mitigation Planning and Hazard Mitigation Grant Program* 72 Fed. Reg. 61552 (October 31, 2007), *Flood Mitigation Grants and Hazard Mitigation Planning* 74 Fed. Reg. 47471 (September 19, 2009), and *Change in Submission Requirements for State Mitigation Plans* 79 Fed. Reg. 22873 (April 25, 2014) stipulate that in order for local governments to be eligible to receive funds from the federal Hazard Mitigation Grant Program, the local jurisdiction must have a hazard mitigation plan that describes the process for identifying hazards, assessing risks and vulnerabilities, and identifying and prioritizing mitigation actions.
- 1.1.2 The Consultant agrees to be/become knowledgeable of and to adhere to the *Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988* (as amended by the Disaster Mitigation Act of 2000), and 44 CFR Parts 201 and 206 - Hazard Mitigation Planning and Hazard Mitigation Grant Program; Interim Final Rule, and to become knowledgeable of and to adhere to the FEMA regulations and rules pertaining to the development of and acceptability of the Local Government’s Hazard Mitigation Plans in order to successfully perform the requirements outlined in this document and within the time specified herein.
- 1.1.3 Under the terms of this document, the Consultant agrees to develop and produce a Local Government “Hazard Mitigation Plan” for SEMA in accordance with these terms and conditions. The use of SEMA’s Hazard Mitigation Plan Outline is **required** and is available here: [http://sema.dps.mo.gov/programs/mitigation\\_management.php](http://sema.dps.mo.gov/programs/mitigation_management.php).
- 1.1.4 Under the terms of this document, the Consultant agrees to develop and produce a Local Government “Hazard Mitigation Plan” for SEMA in accordance with these terms and conditions. The use of the *2018 Missouri State Hazard Mitigation Plan* risk assessment data is **required** to be used in local hazard mitigation plan development.
- 1.1.5 Under the conditions set forth in 44 CFR Part 201.6, the successful development of the Hazard Mitigation Plan must include the open public involvement of local units of government and other local and regional public or private sector bodies or agencies that influence hazard management or development policies within a Local Government. The Consultant must be prepared, under the scope of this Agreement, to participate and at times possibly facilitate the development and conduct meetings necessary to include said bodies in the planning development process. Specifically include all public school districts, universities, colleges and any other eligible entities.



- 1.1.6 Multi-jurisdictional plans (e.g. countywide plans and/or region-wide plans) are permissible local Hazard Mitigation Plans, as long as each jurisdiction within the county has participated in the process and has officially adopted the plan (See Exhibit C - Participating Jurisdictions). Statewide plans will not be accepted as multi-jurisdictional plans.
- 1.1.7 Multi-jurisdictional plans with related purposes (e.g. watershed plans, regional development plans, flood studies, etc.) can be incorporated into the plan as long as the information contained in the multi-jurisdictional plan fully meets all of the requirements outlined in this agreement.
- 1.1.8 For multi-jurisdictional plans, all assessments and discussions in all parts of the plan must show specific differences for each jurisdiction. Including those for special districts, school districts, universities, colleges, and any other potentially eligible entities.
- 1.1.9 The Consultant agrees and understands that any and all services shall be performed only with consent of SEMA.
- 1.1.10 The Consultant agrees to provide SEMA with a first copy **draft** Hazard Mitigation Plan no later than **February 1, 2020** and a final draft due to SEMA no later than **May 1, 2020**. The draft plan must include all signed adoption resolutions for all participating jurisdictions, unless an exception is approved by SEMA. The Consultant also agrees to complete the project by providing the copy of the plan as agreed to by SEMA, unless specifically authorized in writing by SEMA through a properly executed Change Order, coordinated through SEMA’s Primary Agreement Representative (PAR). The Change Order request must be received by SEMA at least 30 days prior to the due dates.

<b>SEMA’S PRIMARY AGREEMENT REPRESENTATIVE (PAR)</b>				
Printed Name: Elizabeth Weyrauch		Title: State Hazard Mitigation Officer		
Missouri State Emergency Management Agency (SEMA)				
Street	City	State	Zip	
Mailing Address	P.O. Box 116	Jefferson City	Missouri	65102
Phone Number:	Fax Number:	E-mail Address		
(573) 526-9375	(573) 526-9198	elizabeth.weyrauch@sema.dps.mo.gov		

- 1.1.11 The Consultant agrees that SEMA has the right to determine if an extension is fairly warranted and necessary. Moreover, the Consultant agrees that an extension to the terms of completion time does not obligate SEMA to provide any additional funds to the Consultant, unless the extension is required due to a modification in the scope of work of this Agreement and is fully documented by SEMA in a properly executed Change Order coordinated through SEMA’s PAR. Should any Local Government, SEMA or FEMA representative or any other person advertently or inadvertently ask the Consultant to perform any work that is not covered under the scope of this Agreement, the Consultant is required to inform SEMA’s PAR who shall coordinate, prepare and properly execute a Change Order, if SEMA determines that the work is necessary.

- 1.1.12 SEMA may, from time to time, request changes in the scope of the services of the Consultant to be performed hereunder. Such changes, including any increase or decrease in the amount of the Consultant's compensation, which are mutually agreed upon by and between SEMA and the Consultant, shall be incorporated in written Change Orders to this Agreement. If SEMA's PAR requests significant modifications or changes in the extent of the project, the time of performance of Consultant's services and rates of compensation shall be adjusted appropriately, provided funding is available.
- 1.1.13 By accepting the definitions, terms, requirements, conditions, tasks, and special considerations of this document, the Consultant agrees that the Local Government's Hazard Mitigation Plan shall meet the final approval of both SEMA and FEMA before the terms of this document are considered to be satisfied for purposes of final payment.
- 1.1.14 SEMA agrees to provide to the Consultant all criteria and full information concerning the requirements for the project and to furnish copies of all documents related to the project.
- 1.1.15 SEMA agrees to assist the Consultant by furnishing information pertinent to the plan, including previous reports and any other data relative to the plan where such information is readily available to SEMA. However, the Consultant acknowledges that the Hazard Mitigation Plan is local in nature and agrees to obtain most of the information pertinent to the plan, including previous reports and any other data relative to the plan where such information is readily available from the Local Government participating in the planning process and other pertinent information sources such as the National Weather Service, the Census Bureau, the Missouri State Hazard Mitigation Plan, FEMA, and other agencies as appropriate.
- 1.1.16 SEMA shall bear the costs, incurred incident to the Consultant's compliance with the requirements of this Agreement, in accordance with the terms and conditions contained in the Financial Management section of this Agreement.
- 1.1.17 The Consultant shall submit monthly statements for services and expenses incurred at the time of billing. SEMA shall make prompt payments in response to consultant's statements.
- 1.1.18 The Consultant shall not assign any interest on this Agreement, and shall not transfer any interest in the same (whether by assignment or novation), without the prior written consent of SEMA thereto: Provided, however, that claims for money by the Consultant from SEMA under this Agreement may be assigned to a bank, trust company, or other financial institution without such approval. Written notice of any such assignment or transfer shall be furnished promptly to SEMA.
- 1.1.19 The Consultant understands and agrees that this Agreement shall not be construed as an exclusive arrangement with SEMA and that other SEMA/State of Missouri agreements may exist with other entities for the same services.
- 1.1.20 The Consultant agrees to submit the Hazard Mitigation plan to SEMA whom shall review the plan; and after completion of review SEMA will forward the plan to FEMA. All participating jurisdictions must formally adopt the plan. In the event FEMA determines the plan "needs improvement," the plan does not meet the minimum requirements. The Consultant will then have sixty (60) days from FEMA's designation of the plan to make necessary improvements. Consultant shall then resubmit the plan to SEMA for another review.

1.1.21 The Consultant understands and accepts their responsibility under the Revised Statutes of Missouri (RSMo) Sections 285.525 through 285.555 (Illegal Immigrants) to ensure that “no business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the state of Missouri.” The Consultant further certifies that any contract awarded by the state will require the contracted business entity to comply with the references mentioned above. The Consultant understands that failure to comply with this requirement will subject the Consultant to the penalties described in the references mentioned above.

### 1.1.22 *References*

- a. *Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988* (as amended by the Disaster Mitigation Act of 2000)
- b. 44 CFR Parts 201 and 206 - Hazard Mitigation Planning and Hazard Mitigation Grant Program.
- c. State of Missouri Hazard Mitigation Plan, (July 2013) ([http://sema.dps.mo.gov/programs/mitigation\\_management.php](http://sema.dps.mo.gov/programs/mitigation_management.php))
- d. **FEMA Local Mitigation Planning How-To Series** (<https://www.fema.gov/media-library/collections/6>)
- e. **FEMA Local Mitigation Plan Review Guide** (October 2011) is mandatory for those plans submitted for final approval after October 1, 2012. ([http://www.fema.gov/media-library-data/20130726-1809-25045-7498/plan\\_review\\_guide\\_final\\_9\\_30\\_11.pdf](http://www.fema.gov/media-library-data/20130726-1809-25045-7498/plan_review_guide_final_9_30_11.pdf))
- f. **FEMA Plan Review Tool** is mandatory and must be submitted with draft plan (see the SEMA Mitigation Webpage under the title “Hazard Mitigation Plan Outline”) ([http://sema.dps.mo.gov/programs/mitigation\\_management.php](http://sema.dps.mo.gov/programs/mitigation_management.php))
- g. **FEMA Local Mitigation Planning Handbook** (March 2013) ([http://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema\\_local\\_mitigation\\_handbook.pdf](http://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf))
- h. **Planning for a Sustainable Future (FEMA 364)** (<http://www.fema.gov/media-library/assets/documents/2110>)
- i. **State and Local Mitigation Planning (FEMA 386-2)** (<http://www.fema.gov/media-library/assets/documents/4241>)
- j. **Multi-Hazard Mitigation Planning Guidance** (<http://www.fema.gov/hazard-mitigation-planning-laws-regulations-policies>)

## 1.2 **SPECIFIC PLAN REQUIREMENTS**

1.2.1 **Local HAZARD MITIGATION PLAN PROCESS, CONTENT AND PRESCRIBED FORMAT:** CONSULTANT AGREES TO FOLLOW THE INSTRUCTIONS CONTAINED IN THE FEMA publication: **Multi-Hazard Mitigation Planning Guidance** and **Plan Review Tool**.

1.2.2 Consultant agrees that **no formal Benefit Cost Analysis is required** for this Local Hazard Mitigation Plan. Consultant acknowledges that this agreement does not cover any costs associated with any formal Benefit Cost Analysis associated with the Local Plan, before or after the plan is developed.

2. **SPECIAL PROVISIONS AND EXHIBITS**

- 2.1 The following exhibits are attached to and made a part of this Agreement.
  - 2.1.1 Exhibit A, "Scope of Services" consisting of 1 page.
  - 2.1.2 Exhibit B, "Additional and Conditions" consisting of 10 pages.
  - 2.1.3 Exhibit C, "Listing of Local Jurisdictions" consisting of 1 page.
  
- 2.2 This Agreement (consisting of pages 1 to 6, inclusive), together with the exhibits identified above (consisting of pages 7 to 21, inclusive), constitute the entire Agreement between SEMA and Consultant and supersede all prior written or oral understandings. This Agreement and said exhibits may only be amended, supplemented, modified, or canceled by a duly executed written instrument.



**EXHIBIT A****SCOPE OF SERVICES  
LOCAL GOVERNMENT HAZARD MITIGATION PLAN**

The Consultant shall complete, in a professional and timely manner, the following services relative to SEMA's Local Hazard Mitigation Plan criteria. Such actions shall be performed in a manner prescribed by FEMA in the FEMA publication: **Multi – Hazard Mitigation Planning Guidance**

1. The Consultant agrees to provide a plan that focuses on mitigation as part of SEMA's emergency management efforts. Unless mutually agreed upon in advance by SEMA and the Consultant, the Local Hazard Mitigation Plan shall contain various sections as described in detail in the FEMA publication: **Multi – Hazard Mitigation Planning Guidance**
2. Some of the pertinent information to be included in the Local Hazard Mitigation Plan may be available from SEMA and FEMA, but the Consultant with the assistance of Local Government shall develop the majority of the information.
3. The Consultant agrees to provide the plan within the Timeline submitted to SEMA and within the time, terms and conditions and the price stated within this Agreement.
4. The Local Hazard Mitigation Plan must be in compliance with the **Local Mitigation Plan Review Tool**, as applicable, developed by FEMA for evaluating such plans.
5. One electronic copy of the draft plan must be provided to SEMA along with a **Plan Review Tool** identifying page numbers where applicable information is located within the plan. Electronic versions must follow the pre-approved format (see Exhibit B, paragraph 3.a. and 3.b.).
6. One electronic copy of the final plan must be provided to SEMA. Changes made in this version of the plan must be communicated using the **Plan Review Tool**, or other acceptable documentation as determined by SEMA.
7. Any deficiencies noted on the previously approved plan's Plan Review Tool (or crosswalk) must be addressed. A copy of the previous Plan Review Tool (or crosswalk) must be submitted to SEMA along with the draft plan update.

**EXHIBIT B****ADDITIONAL TERMS AND CONDITIONS  
PROJECT MANAGEMENT****1. SEMA's Primary Agreement Representative (PAR).**

- a. The Consultant agrees and understands that SEMA's Primary Agreement Representative (PAR) shall supervise each planning project.
- b. The Consultant shall coordinate directly with the PAR (or the PAR's designee(s)) and shall agree and understand that the PAR shall have authority for the following:
  - 1) Final determination of the time frame the Consultant shall follow to provide services and products, and the final determination that the Consultant has completed such services and products.
  - 2) Approval or disapproval of the Consultant's procedures.
  - 3) Responding to the Consultant's questions and requests for assistance.
  - 4) Approval or disapproval of all equipment, materials, personnel, and related services and procedures proposed by the Consultant.
  - 5) Final approval of any additional equipment, materials, and services requested by the Consultant.
  - 6) Determination of the planning project's completion, as described herein.

**2. Copyright.** No report, maps, or other documents produced in whole or in part under this Agreement shall be the subject of an application for copyright by or on behalf of the Consultant.

- a. The Consultant agrees that all plans, annexes, and products developed for and included in this undertaking become "public domain" information, the sole property of SEMA and may not be used for sale or resale.
- b. SEMA agrees to freely share ownership of all plans, annexes, and products developed for and in this undertaking with the Local Government for public domain uses as the Local Government deems appropriate in accordance with local, state, and federal laws.
- c. SEMA also agrees that the Consultant may use freely the plans, annexes, and products developed for and in this undertaking for other public planning purposes, and agrees that written permission will not unreasonably be withheld from the Consultant for other purposes of a non-profit nature that benefits the public.
- d. The Consultant agrees that all plans, annexes, and products developed for and in this undertaking may not be used for any other purposes without SEMA's expressed advance written permission.

**3. Electronic Media.**

- a. SEMA and the Consultant mutually agree in advance to any and all electronic formats that are used in the development of the plan, its annexes and products. The Consultant agrees to use Microsoft Office products compatible with FEMA and SEMA software – Word (text), Excel (spreadsheet), Access (database) and PowerPoint (Graphics/Presentation) documents. The Consultant also agrees to submit the mitigation plan in PDF format as well. SEMA will not be required to pay the Consultant for any work produced on any electronic format not approved in advance by SEMA, unless SEMA determines in advance that the work is acceptable and beneficial to its needs and purposes.
- b. In addition, the Consultant agrees that all database information (key facility maps, hazard analysis maps, GIS maps, etc.) must be incorporated into the plan in CD format, and that the format must be compatible with existing software owned by SEMA (ArcView 3.1, 3.2, 8.3, or 9.3).
- c. The Consultant agrees that the plan must incorporate any previously adopted mitigation related plans, identifies mitigation measures currently undertaken or implemented by the City/County.
- d. The Consultant understands and agrees that all discussions with the Consultant and SEMA, and all information gained by the Consultant as a result of the Consultant's performance under this Agreement shall be subject to the provisions of Missouri Law (RSMo Chapter 610 - <http://www.moga.mo.gov/statutes/c610.htm>) and the Federal Freedom of Information Act. Copies of documents may be released immediately for inspection and copying, according to the provisions of RSMo 610.10, 610.23 and 610.24, as long as the Consultant provides SEMA and the Local Government a courtesy notification of the request for release.
- e. SEMA agrees to work with Local Government to resolve any concerns or issues broached as pertains to the Special Considerations & Conditions of this Agreement.

**4. Personnel**

- a. The Consultant represents that he/she has, or will secure at his/her own expense, all personnel required in performing the services under this Agreement. Such personnel shall not be employees of or have any relationship with SEMA or the State of Missouri.
- b. All of the services required hereunder shall be performed by the Consultant or under his/her supervision and all personnel engaged in the work shall be fully qualified and shall be authorized or permitted under State and Local law to perform such services.
- c. None of the work or services covered by this Agreement shall be subcontracted without the prior written approval of SEMA. Intent to use subcontracted work shall be spelled out in Exhibit C, the Schedule of Fees and the Work Plan. Any work or services subcontracted hereunder shall be specified by this written Agreement and shall be subject to each provision of this Agreement.

- d. The Consultant agrees not to represent its employees, including subcontracted employees as an employee(s) of SEMA, the State of Missouri or the Local Government.
- e. The Consultant represents that it is subject to the Missouri State Legal Expense fund, established by Missouri Statute, and administered and interpreted by the Attorney General of the State of Missouri, and the Consultant has no liability insurance which can extend protection to any other person. To the extent provided by Missouri Law, and in no way to be construed as any waiver or limitation of the doctrines of sovereign, official or governmental immunity, the Consultant agrees to be fully and entirely responsible for its own acts and omissions, whether negligent or not, in conformance with the performance of the terms and conditions of this Agreement. The Consultant to the extent provided by Missouri Law, further agrees to protect, indemnify and hold harmless, with respect to any damages arising from any tort done in performing any of the work embraced by this Agreement, SEMA and Local Government and the officers and agents of those entities, from any claim or liability arising from or based on the violation of any law, ordinance, regulation, order or decree, by the Consultant or the Consultant's employees.
- f. Subcontracting:
  - 1) The Consultant agrees and understands that SEMA's concurrence to the Agreement may be predicated in part on the utilization of the specific Consultant identified in the bid. Therefore, the Consultant agrees that no substitution of such specific Consultant and/or personnel qualifications identified in the Agreement shall be made without the prior written approval of SEMA.
  - 2) The Consultant further agrees that any substitution made pursuant to this paragraph must be equal or better than originally proposed and that SEMA's approval of a substitution shall not be construed as an acceptance of the substitution's performance potential. SEMA agrees that an approval of a substitution will not be unreasonably withheld.
  - 3) No subcontracting fees, charges, or hidden commissions shall be allowed or reimbursed beyond the scope of the Consultant's proposal/work plan.
  - 4) Should the Consultant subcontract for those services described herein, any subcontracts shall include appropriate provisions and obligations to ensure the successful fulfillment of all obligations agreed to by the Consultant and SEMA in this Agreement and to ensure that SEMA and the State of Missouri is indemnified, saved, and held harmless from and against any and all claims of damage, loss, and cost (including attorney fees) of any kind related to a subcontract in those matters described in this Agreement between SEMA and the Consultant.
  - 5) The Consultant shall expressly understand and agree that the Consultant assumes and is solely responsible for all legal and financial responsibilities related to the execution of any subcontract.



- 6) The Consultant agrees and understands that utilization of a subcontractor to provide any of the equipment or services in this Agreement shall in no way relieve the Consultant of the responsibility for providing the equipment or services as described and set forth herein.
- 7) The Consultant shall bear the sole responsibility for the safety of its employees and any subcontractors the Consultant may choose to utilize in the performance of the services described herein.

**5. Compliance with Laws, Ordinances, Regulations and Executive Orders.**

- a. The Consultant agrees to complete such action as is required to become fully informed of all State and National laws and county and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work and the Consultant shall at all times observe and comply with, all such applicable existing and future laws, ordinances, regulations, orders and decrees and the Consultant further agrees to the extent permitted by law to protect, indemnify and hold harmless, with respect to any damages arising from any tort done in performing any of the work embraced by this Agreement, SEMA, the State of Missouri and Local Government and the officers and agents of those entities, from any claim or liability arising from or based on the violation of any law, ordinance, regulation, order or decree, whether by the Consultant or the Consultant's employees.
- b. ***Equal Employment Opportunity.*** During the performance of this Agreement, the Consultant agrees as follows:
  - 1) The Consultant shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, religion, or sex. The Consultant will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, national origin, religion, or sex. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by SEMA setting forth the provisions of this non-discrimination clause.
  - 2) The Consultant shall, in all solicitation or advertisements for employees placed by or on behalf of the Consultant; state that all qualified applicants will receive consideration for employment without regard to race, creed, color, national origin, religion, or sex.
  - 3) The Consultant shall cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Agreement so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to subcontracts for standard commercial supplies or raw materials.

- 4) The Consultant shall comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.
  - 5) The Consultant shall furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by SEMA, the State of Missouri, the Local Government, FEMA and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.
  - 6) In the event of the Consultant's noncompliance with the non-discrimination clauses of this Agreement or with any of such rules, regulations or orders, this Agreement may be canceled, terminated, or suspended in whole or in part and the Consultant may be declared ineligible for further Government agreements in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
  - 7) The Consultant shall include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Consultant will take such action with respect to any subcontract or purchase order as SEMA may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the Consultant becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by SEMA, the Consultant may request the United States Government to enter into such litigation to protect the interests of the United States.
- c. ***Civil Rights Act of 1964:*** Under Title VI of the Civil Rights Act of 1964, No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.
- d. ***Section 109(a) of the Housing and Community Development Act of 1974:*** No person in the United States shall on the ground of race, color, national origin, religion, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title. Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in; section 504 of the Rehabilitation Act of 1973 shall also apply to any such program or activity.

- e. ***Section 503 of Rehabilitation Act of 1973***, as amended: Provides for the nondiscrimination in consultants employment. All recipients of Federal funds must certify to the following through all agreements issued.

***Affirmative Action for Handicapped Workers:***

- 1) The Consultant shall not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Consultant agrees to take affirmative action to employ, advance in employment and to otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: Employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship.
  - 2) The Consultant agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
  - 3) In the event of the Consultant's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
  - 4) The Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the SEMA officer. Such notices shall state the Consultant's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.
  - 5) The Consultant shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other understanding that the Consultant is bound by terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
  - 6) The Consultant shall include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The Consultant will take such action with respect to any subcontractor or purchase order as the Director of the Office of Federal Compliance Programs may direct to enforce such provisions, including action for noncompliance.
- f. ***Section 504 of the Rehabilitation Act of 1973***, as amended: Provides for nondiscrimination of an otherwise qualified individual solely on the basis of his/her handicap in benefiting from any program or activity receiving Federal financial

assistance. All recipients must certify to compliance with all provisions of this Section.

- g. ***Age Discrimination Act of 1975:*** No person in the United States, on the basis of age, be excluded from participation in, be denied benefits of, or be subjected to discrimination under, any program or activity receiving Federal financial assistance.
  - h. ***Interest of Members of the Owner:*** No member of the governing body of the State and no other officer, employee, or agent of the State who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Agreement, and the Consultant shall take appropriate steps to assure compliance.
  - i. ***Interest of Other Local Public Officials:*** No member of the governing body of the locality and no other public official of such locality, who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Agreement; and the Consultant shall take appropriate steps to assure compliance.
  - j. ***Interest of Consultant and Employees:*** The Consultant covenants that he/she presently has no interest and shall not acquire interest, direct or indirect, in the study area or any parcels therein or any other interest which would conflict in any manner or degree with the performance of his services hereunder. The Consultant further covenants that in the performance of this Agreement, no person having any such interest shall be employed.
6. **Reports and Information:** The Consultant, at such times and in such forms as SEMA may require, shall furnish SEMA such periodic reports as described below as SEMA may request pertaining to the work or services undertaken pursuant to this Agreement, the costs and obligations incurred or to be incurred in connection therewith, and any other matters covered by this Agreement.
- a. As the work progresses, the Consultant agrees to make advice and information on matters performed by the Consultant reasonably available to the PAR.
  - b. The Consultant agrees to provide a Monthly Progress Report to the PAR by the 10<sup>th</sup> of the month. Invoicing is recommended at the 25%, 50%, 75%, and 100% points of completion of plan. *See page 16, 10 (f)*. The Monthly Progress Report shall contain the following information for the prior month:
    - 1) Date of Report
    - 2) Name of Consultant Organization and the name and telephone number of the report preparer
    - 3) Brief Narrative of any significant activities or meetings conducted during the month, any Milestones Completed, any concerns or complications noted and any assistance requested
    - 4) Percent of Plan Completed to Date



7. **Termination of Agreement for Cause.**

- a. The Consultant agrees to give prompt written notice to SEMA whenever the Consultant becomes aware of any development that affects the scope of timing of the Consultant's services.
- b. If, through any cause, the Consultant shall fail to fulfill in timely and proper manner his obligations under this Agreement, or if the Consultant shall violate any of the covenants, agreements, or stipulations of this Agreement, SEMA shall thereupon have the right to terminate this Agreement by giving written notice to the Consultant of such termination and specifying the effective date thereof, at least seven days before the effective date of such termination. In such event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs and reports prepared by the Consultant under this Agreement shall, at the option of SEMA, become its property and the Consultant shall be entitled to receive just and Equitable compensation for any work satisfactorily completed hereunder.
- c. Notwithstanding the above, the Consultant shall not be relieved of liability to SEMA for damages sustained by SEMA by virtue of any breach of this Agreement by the Consultant, and SEMA may withhold any payments to the Consultant for the purpose of set-off until such time as the exact amount of damages due SEMA from the Consultant is determined.

8. **Termination for Convenience of SEMA.**

- a. SEMA may terminate this Agreement at any time by giving at least ten (10) days notice in writing to the Consultant. If the Agreement is terminated by SEMA as provided herein, the Consultant will be paid for the time provided and expenses incurred up to the termination date.
- b. SEMA agrees to give prompt written notice to the Consultant whenever SEMA observes or otherwise becomes aware of any development that adversely affects the scope, timing or satisfactory fulfillment of the Consultant's services.
- c. If this Agreement is terminated due to the fault of the Consultant, Paragraph 8.b. hereof relative to termination shall apply as part of the termination process.

9. **Records and Audits.** The Consultant shall maintain accounts and records, including personnel, property and financial records, adequate to identify and account for all costs pertaining to the Agreement and such other records as may be deemed necessary by SEMA to assure proper accounting for all project funds, both Federal and non-Federal shares. These records will be made available for audit purposes to SEMA or any authorized representative, and **shall be retained for three years *after* the "Close Out" of the Planning Grant Agreement**, after permission to destroy them is granted by SEMA.

**10. Payments.**

- a. The Consultant shall be paid in accordance with the firm, fixed price stated herein. The maximum amount SEMA shall pay the Consultant for performance of this agreement shall not exceed \$92,950.00, without written consent by SEMA.
- b. For grant management and audit purposes, the above federal amount must be added to the local nonfederal match amount of \$30,983.00 to be provided by the Mid-America Regional Council (MARC) for which the plan is being prepared and/or the Consultant to calculate the total planning project value of \$123,933.00.
- c. The Consultant understands that the Memorandum of Agreement is subject to the availability of grant funding. All work must cease at expiration of the grant. The Consultant may complete work only with the understanding that no additional cost can be charged and will not be paid by the grant.
- d. The Consultant understands that the payment/documentation of the local match is the sole responsibility of the Consultant on behalf of the local jurisdictions for which this plan is being prepared. SEMA is providing only the federal share of the grant being used to fund this planning project. The Consultant and the participating local jurisdictions shall determine jointly how much of the planning work is to be performed by the local jurisdictions/Consultant in the event that the nonfederal match is provided in a form other than cash. The Consultant and the local jurisdictions also shall determine jointly how the local jurisdictions shall pay the Consultant in the event that the local jurisdictions provide the nonfederal match in the form of cash. SEMA has no responsibility to the Consultant for any payments owed by the local jurisdictions. The Consultant also agrees to assist the local jurisdictions to prepare and submit to SEMA each month the paperwork necessary to document the non-federal match.
- e. Payment for this Agreement shall be full compensation for services rendered, including, but not limited to, all labor, materials, supplies, equipment, and incidentals necessary to complete the services required herein, as well as overhead. The Consultant shall not be entitled to any other payments or reimbursements for this planning project without the written consent of SEMA.
- f. The Consultant may submit a request for payment to which SEMA shall respond, at the following percentages of project completion:
  - Twenty-five percent of the Agreement price (federal share) which shall be paid to the Consultant prior to FEMA approval of the Hazard Mitigation Plan. Twenty-five percent of the local match documentation must be submitted along with the request for payment.
  - Fifty percent of the Agreement price (federal share) which shall be paid to the Consultant prior to FEMA approval of the Hazard Mitigation Plan. Fifty percent of the local match documentation must be submitted along with the request for payment.
  - Seventy-five percent of the Agreement price (federal share) which shall be paid to the Consultant prior to FEMA approval of the Hazard Mitigation Plan. Seventy-five percent of the local match documentation must be submitted along with the request for payment.

- One-hundred percent of the Agreement price (federal share) which shall be paid to the Consultant after FEMA approval of the Hazard Mitigation Plan. One-hundred percent of the local match documentation must be submitted along with the final request for payment.
- g. The acceptance by the Consultant of final payment shall be and shall operate as a release to SEMA, the State of Missouri, FEMA and the Local Government of all claims and liability to the Consultant for all things done or furnished in connection with this work and for every act and neglect of SEMA, the State of Missouri, FEMA and the Local Government relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Consultant from any obligations under this Agreement or the performance of the work completed, i.e. a Local Hazard Mitigation Plan in compliance with the federal regulations previously identified.

**11. Repayment Clause.**

If the Consultant does not submit Hazard Mitigation Plans according to the dates outlined in 1.1.10 of this agreement, SEMA shall request, and the Consultant shall return within 30 days, the total Federal funds SEMA spent under this agreement.

**EXHIBIT C****LISTING OF LOCAL JURISDICTIONS**

The Consultant shall develop a regional multi-jurisdictional plan to meet the needs of the following local jurisdictions in **Kansas City Region**:

**Cass County**

Cass County, City of Archie, Village of Baldwin Park, City of Belton, City of Cleveland, City of Creighton, City of Drexel, City of East Lynne, City of Freeman, City of Garden City, Village of Gunn City, City of Harrisonville, City of Lake Annette, City of Lake Winnebago, City of Peculiar, City of Pleasant Hill, City of Raymore, City of Strasburg, Village of West Line

**Clay County**

Clay County, City of Avondale, Village of Birmingham, Village of Claycomo, City of Excelsior Estates, City of Excelsior Springs, City of Gladstone, City of Glenaire, City of Holt, City of Kearney, City of Liberty, City of Missouri City, City of Mosby, City of North Kansas City, Village of Oaks, Village of Oakview, Village of Oakwood, Village of Oakwood Park, Pleasant Valley, City of Pleasant Valley, Village of Prathersville, City of Randolph, City of Smithville.

**Jackson County**

Jackson County, City of Blue Springs, City of Buckner, City of Grain Valley, City of Grandview, City of Greenwood, City of Independence, City of Kansas City, City of Lake Lotawana, City of Lake Tapawingo, City of Lee's Summit, City of Levasy, City of Lone Jack, City of Oak Grove, City of Raytown, Village of River Bend, Village of Sibley, City of Sugar Creek, Village of Unity Village.

**Platte County**

Platte County, City of Camden Point, City of Dearborn, City of Edgerton, Village of Farley, Village of Ferrelview, City of Houston Lake, Village of Iatan, City of Lake Waukomis, City of Northmoor, City of Parkville, City of Platte City, City of Platte Woods, Village of Ridgely, City of Riverside, City of Tracy, City of Weatherby Lake, City of Weston.

**Ray County**

Ray County, City of Camden, City of Crystal Lakes, Village of Elmira, City of Fleming, City of Hardin, City of Henrietta, Village of Homestead, City of Lawson, City of Orrick, Village of Rayville, City of Richmond, City of Wood Heights.

**Other applicable Special Districts**

The Consultant shall notify, invite, and encourage active involvement and participation by representatives of each jurisdiction listed above in public meetings, planning meetings, and in the review of draft information to ensure the plan accurately and appropriately reflects the needs, conditions, desires and capabilities of each participating jurisdiction.



## **APPENDIX C: MAPS & REFERENCES**

### ***Attachment 1: Appendix C Maps***

**Dams in Five County Region**  
**Flood Events 2015-2019**  
**Tornadoes 1996-2019**  
**Tornadoes 1996-2019 Property Damage**  
**Tornadoes Width 1996-2019**

### ***Attachment 2: Appendix C References***

# Appendix C Maps

Multi-Jurisdictional Hazard Mitigation Plan

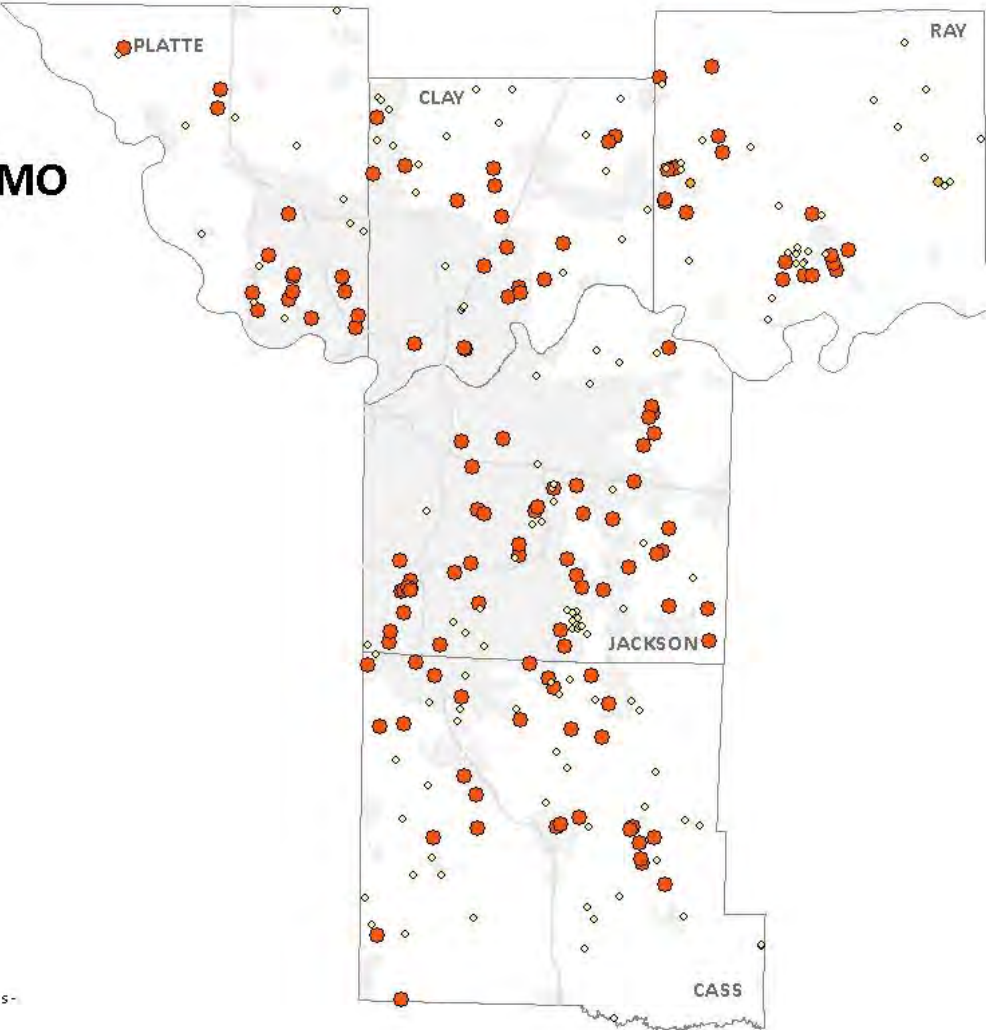
June 2020



# DAMS IN FIVE COUNTY REGION

## Dams in Region - MO

- HAZARD**
- High (131)
  - ◆ Significant (2)
  - ◇ Low (132)

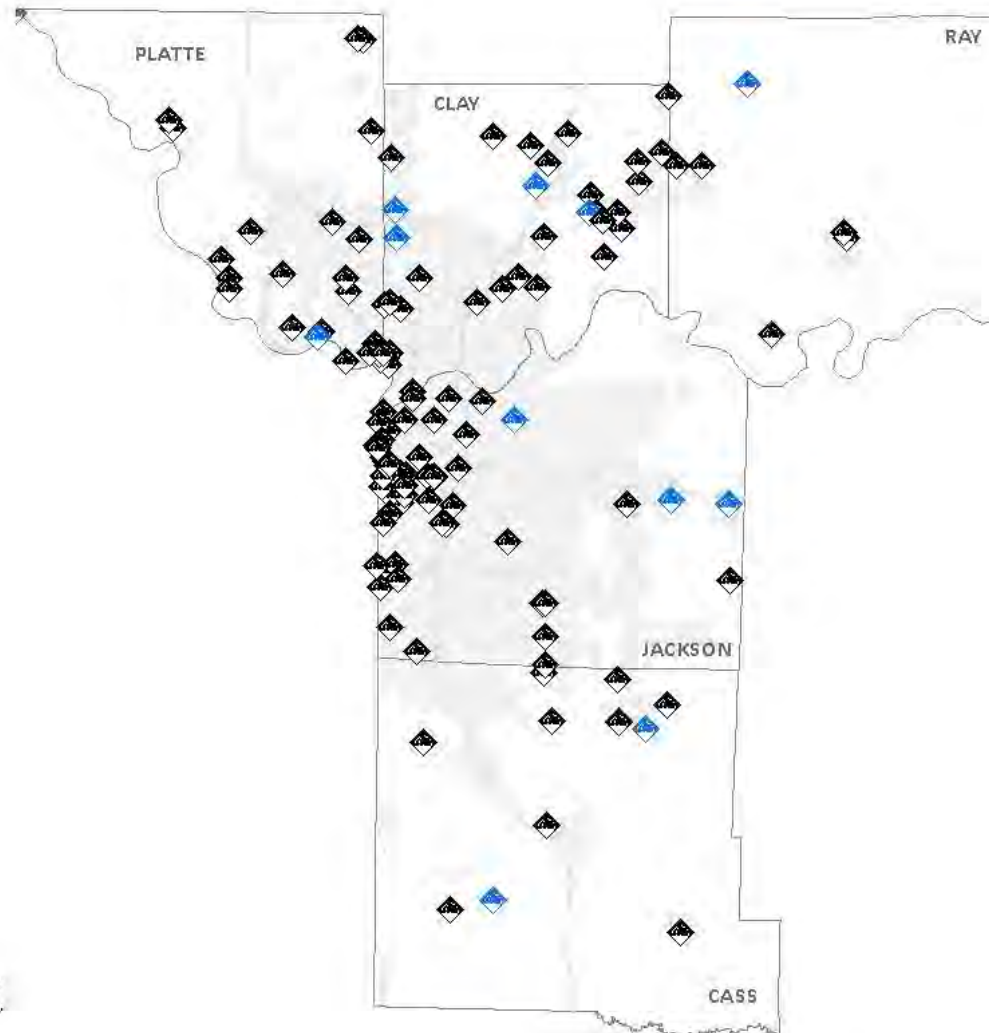


Data source:  
MDNR - Missouri Department of Natural Resources -  
Water Resources Program, MARC 2019

# FLOOD EVENTS 2015 - 2019

## Flood Events 2014 - 2019

- ◆ Flash Flood (118)
- ◆ Flood (13)



Data source: National Oceanic and Atmospheric Administration's (NOAA) Storm Events Database, MARC 2019

# TORNADOES 1996 - 2019

## Tornadoes 1996 - 2019

### Missouri Tornadoes

#### EF or F Scale

- EF0; F0 (21)
- EF1; F1 (13)
- EF2; F2 (8)
- EF3; F3 (3)
- F4 : F4 (3)

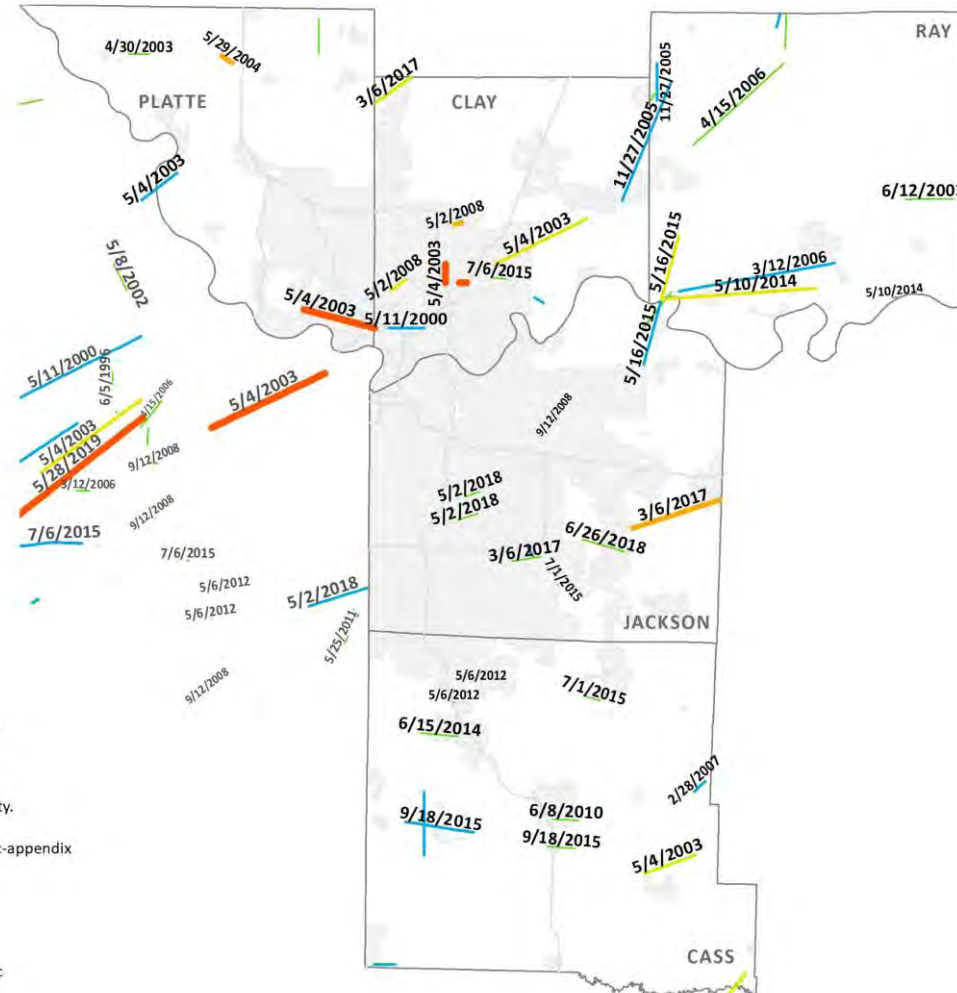
### Kansas Tornadoes

#### EF or F Scale

- EF0; F0 (19)
- EF1; F1 (8)
- EF2; F2 (1)
- EF3; F3 (0)
- EF4; F4 (2)

The EF, or Enhanced Fujita scale, currently used by meteorologists went into operation in 2007. This scale is based on estimated wind speeds and related damage. Previously, the F, or Fujita scale, was used to rank tornado damage intensity. More information at : <https://www.weather.gov/oun/tornadodata-okc-appendix>

Data source: National Oceanic and Atmospheric Administration (NOAA), MARC 2019



# TORNADOES 1996 – 2019 PROPERTY DAMAAGE

## Tornadoes 1996 - 2019

### Missouri Tornadoes

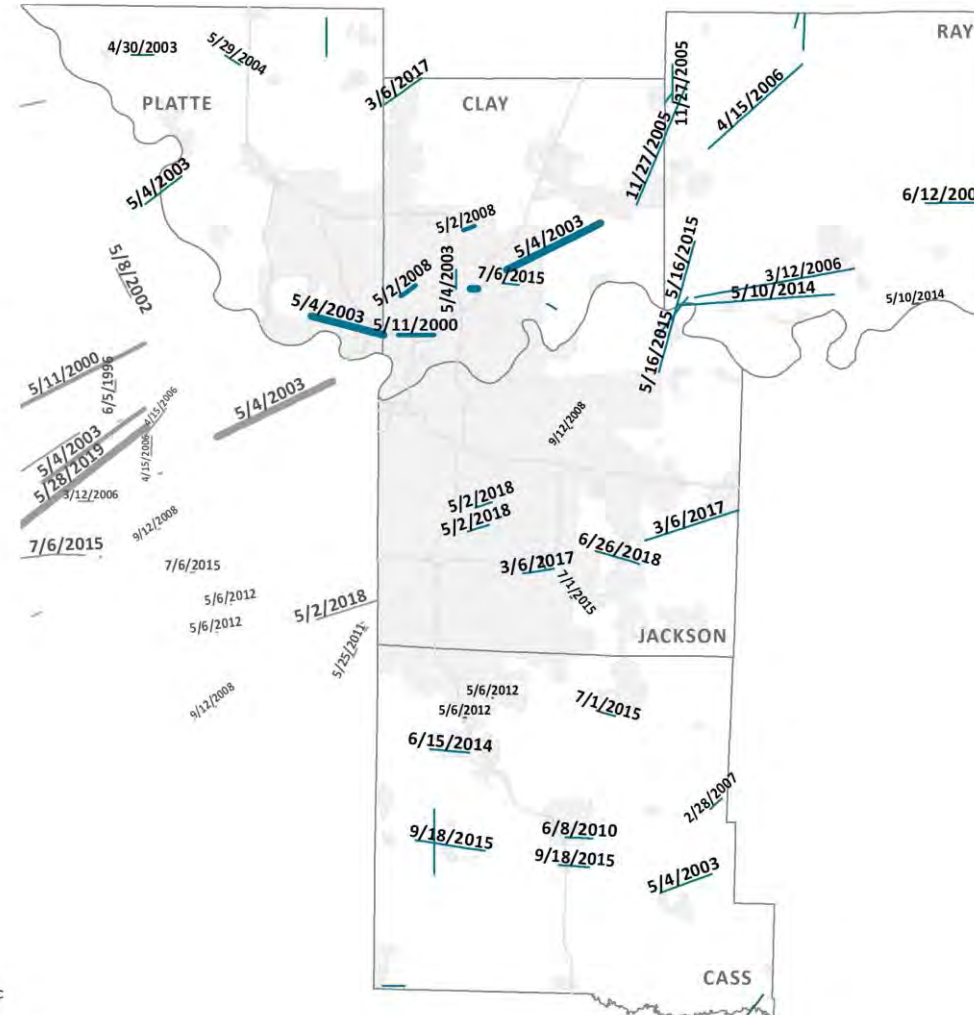
#### Property Damage

- \$0.00 - \$2,000,000 (42)
- \$2,000,001 - \$10,000,000 (3)
- \$10,000,001 - \$60,000,000 (3)

### Kansas Tornadoes

#### Property Damage

- \$0.00 - \$400,000 (26)
- \$400,001 - \$6,000,000 (2)
- \$6,000,001 - \$26,000,000 (2)

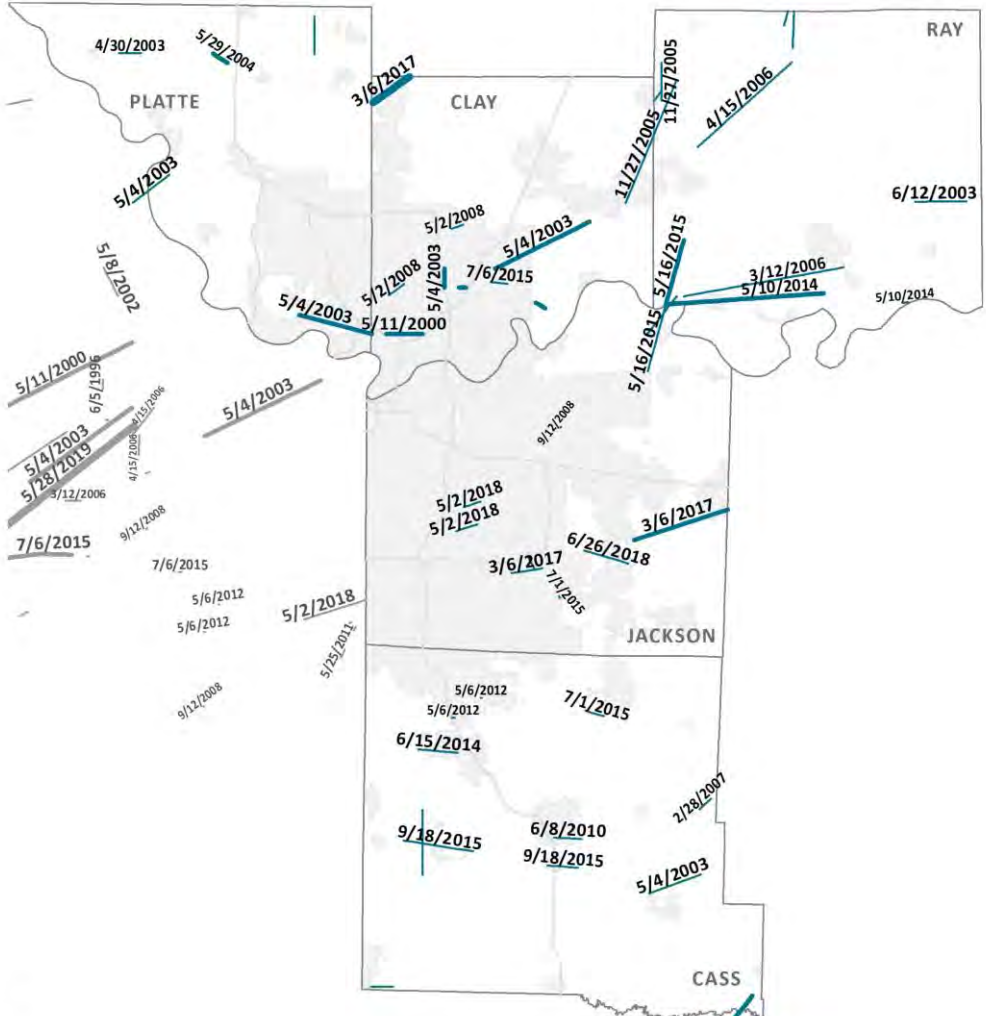


Data source: National Oceanic and Atmospheric Administration (NOAA), MARC 2019

# TORNADOES WIDTH 1996 - 2019

## Tornadoes 1996 - 2019

- Missouri Tornado Width (ft)**
- 10 - 150 (35)
  - 151 - 500 (12)
  - 501 - 1000 (1)
- Kansas Tornado Width (ft)**
- 10 - 150 (24)
  - 151 - 500 (5)
  - 501 - 1760 (1)



Data source: National Oceanic and Atmospheric Administration (NOAA), MARC 2019

## APPENDIX C

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## APPENDIX D: ACRONYMS

### Regional Groups and Systems

APWA	American Public Works Association (KC metro chapter develops common standards for stormwater management and other infrastructure)
CCTA	Complex Coordinated Terrorist Attacks (federal program focused on increasing capacity for local jurisdictions within the metro area to work together to reduce risks and improve response capacities)
CDRN	Community Disaster Resiliency Network (network of community organizations convened to increase their capacity to serve vulnerable populations during disaster events)
GIS	Geographic Information System (regional GIS consortium works with MARC to provide GIS resources for emergency planning and response)
HCC	Health Care Coalition (coalition of EMS, emergency management, hospital, public health and medical examiner/coroners.
HOAFC	Health of America Fire Chiefs
KC TEAM	KC Tracking of Emergency Assets and Members – tracks personnel and equipment for emergency response
KCRMORG	Provide the personnel and resources to facilitate an organized and effective response to mass fatality events
LEPC	Local Emergency Planning Committee (Mid-America) (Brings first responders and private industry together to reduce risks from hazardous materials incidents)
MARC	Mid-America Regional Council (Metropolitan planning organization and association of city and county governments)
MARCER	Mid-America Regional Council Emergency Rescue Committee (brings hospitals and EMS agencies together to ensure high quality pre-hospital emergency care and coordination)
MEMC	Metropolitan Emergency Managers Committee (brings local, state and federal emergency managers and key partners together to coordinate emergency preparedness and response)
MERS	Metropolitan Emergency Response System (radio system used by local emergency managers to coordinate and communicate during an emergency)
MOHAKCA	Metropolitan Official Health Agencies of the Kansas City Area (local public health departments)
MRC	Medical Reserve Corps (volunteers committed to helping support health and medical response in an emergency)
PSCB	Public Safety Communications Board oversees the region's 911 system and interoperable communications
RAPIO	Regional Association of Public Information Officers (local government PIOs)
RHSCC	Regional Homeland Security Coordinating Committee



**State**

CSR	Code of State Regulations
CUSEC	Central United States Earthquake Coalition
DESE	Department of Elementary and Secondary Education
DFS	Division of Fire Safety
DPS	Department of Public Safety
DHSS	Department of Health and Senior Services
MACOG	Missouri Association of Councils of Government
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MODOT	Missouri Department of Transportation
MOFWIS	Missouri Fish and Wildlife Information System
MSSC	Missouri Seismic Safety Commission
RSMo	Revised Statutes of Missouri
SAVE	Structural Assessment and Visual Evaluation Coalition
SEMA	State Emergency Management Agency
SHMO	State Hazard Mitigation Officer

**Federal and National**

ARC	American Red Cross
AASHTO	American Association of State Highway and Transportation Officials
ASFPM	Association of State Floodplain Managers
ATC	Applied Technology Council
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BSSC	Building Seismic Safety Council
CDBG	Community Development Block Grant
CERI	Center for Earthquake Research and Information
CFR	Code of Federal Regulations
CRS	Community Rating System
DHS	Department of Homeland Security
DOD	Department of Defense
DOI	Department of the Interior
DOT	Department of Transportation
EDA	Economic Development Administration
EMWIN	Emergency Managers Weather Information Network
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ER	Emergency Relief
EWP	Emergency Watershed Protection (NRCS program)
FAS	Federal Aid System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map

**Federal and National (Continued)**

GIS	Geographic Information System
GNS	Institute of Geological and Nuclear Sciences (international)
GSA	General Services Administration
HAZMAT	Hazardous materials
HAZUS	Hazards U.S.
HHS	Health and Human Services, U.S. Department of
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development, U.S. Department of
IA	Individual Assistance
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
ICS	Incident Command System
IMS	Incident Management System
IHMT	Interagency Hazard Mitigation Team
NCDC	National Climate Data Center
NEHRP	National Earthquake Hazards Reduction Program
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan
NIBS	National Institute of Building Sciences
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
OMB	Office of Management and Budget
PA	Public Assistance
PDM	Pre-Disaster Mitigation Program
PHMSA	Pipeline and Hazardous Materials Safety Administration
SBA	Small Business Administration
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey

**APPENDIX E: GLOSSARY**

<b>Alluvium</b>	Material, such as sand, silt or clay, deposited on land by streams (Missouri Cooperative Soil Survey).
<b>Bedrock</b>	The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface (Missouri Cooperative Soil Survey).
<b>Boulders</b>	Rock fragments larger than 2 feet (60 centimeters) in diameter (Missouri Cooperative Soil Survey).
<b>Calcareous soil</b>	A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid (Missouri Cooperative Soil Survey).
<b>Canadian Shield</b>	Also known as the Laurentian Plateau, it is a U-shaped region of ancient rock, the nucleus of North America, stretching north from the Great Lakes to the Arctic Ocean. Covering more than half of Canada, it also includes most of Greenland and extends into the United States as the Adirondack Mountains and the Superior Highlands. The first part of North America to be permanently elevated above sea level, it has remained almost wholly untouched by successive encroachments of the sea upon the continent. It is the earth's greatest area of exposed Archaean-age rock; the metamorphic rocks of which it is largely composed were probably formed in the Precambrian era. Repeatedly uplifted and eroded, it is today an area of low relief (1,000–2,000 feet above sea level) with a few monadnocks and low mountain ranges (including the Torngat and Laurentian Mountains) probably eroded from the plateau during the Cenozoic era (Columbia Electronic Encyclopedia, online data).
<b>Candidate species</b>	Plants and animals that have been studied and the U.S. Fish and Wildlife Service has concluded that they should be proposed for addition to the Federal endangered and threatened species list. These species have formerly been referred to as category 1 candidate species. From the February 28, 1996 <i>Federal Register</i> , page 7597: "those species for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded" (FWS Region 3 Endangered Species Glossary, online data).

<b>Chert</b>	A rock that closely resembles flint and consists primarily of chalcedony (quartz) with smaller amounts of other quartz and silica. Chert is insoluble, unlike the carbonate rocks with which it usually occurs in Missouri (Nigh, 207).
<b>Clay</b>	As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt (Missouri Cooperative Soil Survey).
<b>Digital Elevation Model, 30 Meter</b>	Digital Elevation Model, or DEM, refers to a type of topographical map depicting samples of elevation at 30 meter intervals (CARES website, online data). Topographical maps in Part II: Regional Profile of this plan are part of the Missouri portion of the National Elevation Dataset produced by the USGS and available online at the University of Missouri CARES website.
<b>Drainage class</b>	<p>Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized (Missouri Cooperative Soil Survey):</p> <ul style="list-style-type: none"><li>• <i>Excessively drained.</i>—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.</li><li>• <i>Somewhat excessively drained.</i>—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.</li><li>• <i>Well drained.</i>—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and the wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.</li></ul>

- *Moderately well drained.*—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
- *Somewhat poorly drained.*—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
- *Poorly drained.*—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
- *Very poorly drained.*—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

**Ecosystem**

A geographic area including all the living organisms (people, plants, animals, and microorganisms), their physical surroundings (such as soil, water, and air), and the natural cycles that sustain them. All of these elements are interconnected. Managing any one resource affects the others in that ecosystem. Ecosystems can be small (a single stand of aspen) or large (an entire watershed including hundreds of forest stands across many different ownerships) (U.S. Fish and Wildlife Service, online data).

<b>Erosion</b>	The wearing away of the land surface by water, wind, ice or other geologic agents and by such processes as gravitational creep (Missouri Cooperative Soil Survey).
<b>Floodplain</b>	A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially (Missouri Cooperative Soil Survey).
<b>Glacial drift</b>	Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers (Missouri Cooperative Soil Survey).
<b>Glacial till</b>	Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice (Missouri Cooperative Soil Survey).
<b>Hazard</b>	Natural, technological or civil threats to people, property and the environment (Drabek and Hoetmer, 132).
<b>Hazard identification</b>	The process of identifying hazards that threaten a given area (SEMA <i>Regional Planning Commission Hazard Mitigation Planning Guide</i> ).
<b>Igneous</b>	Igneous rocks (from the Greek word for <i>fire</i> ) form when hot, molten rock (magma) crystallizes and solidifies. Igneous rocks are divided into two groups, intrusive or extrusive, depending upon where the molten rock solidifies. <i>Intrusive</i> , or plutonic, igneous rock forms when magma is trapped deep inside the earth, where it cools very slowly over many thousands or millions of years until it solidifies. <i>Extrusive</i> , or volcanic, igneous rock is produced when magma exits and cools outside of, or very near, the earth's surface (USGS and NPS, online data).
<b>Land resource units</b>	Geographic areas, usually several thousand acres in extent, that are characterized by a particular pattern of soils, climate, water resources, and land uses. A unit can be one continuous area or several separate nearby areas. Land resource units (LRUs) are the basic units from which major land resource areas (MLRA's) are determined. They are also the basic units for state land resource maps. They are coextensive with state general soil map units, but some general soil map units are subdivided into land resource units because of significant geographic differences in climate, water resources, and land use (NRCS, online data).

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<b>Loess</b>	Fine grained material, dominantly of silt-sized particles, deposited by wind (Missouri Cooperative Soil Survey).
<b>Major land resource areas</b>	Major land resource areas (MLRAs) are geographically associated land resource units (LRUs). Identification of these large areas is important in statewide agricultural planning and has value in interstate, regional and national planning (NRCS, online data).
<b>Mesic</b>	Relatively moist A term used to describe landscapes capable of supporting vegetation (mesophytes) requiring an adequate moisture supply (Nigh, 208).
<b>Metamorphic rock</b>	Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline (Missouri Cooperative Soil Survey).
<b>Mitigation</b>	Sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. It describes the ongoing efforts at the federal, state, local and individual levels to lessen the impact of disasters upon families, homes, communities and economy (SEMA <i>Regional Planning Commission Hazard Mitigation Planning Guide</i> ).
<b>Missouri Ecological Classification System</b>	The Missouri Ecological Classification System is one of several systems used to classify the land surface. This system divides Missouri into sections, subsections and landtype associations based on geography, topography, geology, vegetation, soils and other natural characteristics. This system is described in more detail in the “Ecosystems” section of this plan. Refer to Nigh and Schroeder’s <i>Atlas of Missouri Ecoregions</i> for detailed information on this system and the natural environments of the state.
<b>Parent material</b>	The unconsolidated organic and mineral material in which soil forms (Missouri Cooperative Soil Survey).
<b>Pediment</b>	Fine textured sediment that is similar in composition to the constituents of the underlying material (Missouri Cooperative Soil Survey).
<b>Period</b>	A unit of time on the geologic timescale. Periods are shorter than an era and longer than an epoch. Periods are of variable length,

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	<p>generally lasting tens of millions of years, with characteristic fossils found preserved in the sediments deposited during the period. It is also used to designate a characteristic of geologic time, such as the glacial period (Columbia Electronic Encyclopedia, online data).</p>
<b>Repetitive Flood Loss</b>	<p>A property having two flood insurance payments of at least two flood insurance payments of at least <b>\$1,000</b> in any 10-year period.</p>
<b>Residuum</b>	<p>Residual soil material. Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place (Missouri Cooperative Soil Survey, online data).</p>
<b>Risk</b>	<p>The probability that a hazard will occur during a particular time period (Drabek and Hoetmer, 132). It is the estimated impact that a hazard [may] have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage (SEMA <i>Regional Planning Commission Hazard Mitigation Planning Guide</i>, 37).</p>
<b>Risk assessment</b>	<p>The process of measuring the potential loss of life, personal injury, economic injury and property damage resulting from hazards (SEMA <i>Regional Planning Commission Hazard Mitigation Planning Guide</i>, 37).</p>
<b>Sand</b>	<p>As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay (Missouri Cooperative Soil Survey, online data).</p>
<b>Sandstone</b>	<p>Sedimentary rock containing dominantly sand-sized particles (Missouri Cooperative Soil Survey, online data).</p>
<b>Sedimentary rock</b>	<p>Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone (Missouri Cooperative Soil Survey, online data).</p>
<b>Silt</b>	<p>As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay (Missouri Cooperative Soil Survey, online data).</p>



<b>Slope</b>	<p>The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized (Missouri Cooperative Soil Survey, online data):</p> <table> <tr> <td>Nearly level</td> <td>0 to 1 percent</td> </tr> <tr> <td>Nearly level and very gently sloping</td> <td>0 to 3 percent</td> </tr> <tr> <td>Very gently sloping</td> <td>1 to 3 percent</td> </tr> <tr> <td>Gently sloping</td> <td>2 to 5 percent</td> </tr> <tr> <td>Moderately sloping</td> <td>5 to 9 percent</td> </tr> <tr> <td>Strongly sloping</td> <td>9 to 14 percent</td> </tr> <tr> <td>Moderately steep</td> <td>14 to 20 percent</td> </tr> <tr> <td>Steep</td> <td>20 to 30 percent</td> </tr> <tr> <td>Very steep</td> <td>More than 30 percent</td> </tr> </table>	Nearly level	0 to 1 percent	Nearly level and very gently sloping	0 to 3 percent	Very gently sloping	1 to 3 percent	Gently sloping	2 to 5 percent	Moderately sloping	5 to 9 percent	Strongly sloping	9 to 14 percent	Moderately steep	14 to 20 percent	Steep	20 to 30 percent	Very steep	More than 30 percent
Nearly level	0 to 1 percent																		
Nearly level and very gently sloping	0 to 3 percent																		
Very gently sloping	1 to 3 percent																		
Gently sloping	2 to 5 percent																		
Moderately sloping	5 to 9 percent																		
Strongly sloping	9 to 14 percent																		
Moderately steep	14 to 20 percent																		
Steep	20 to 30 percent																		
Very steep	More than 30 percent																		
<b>Soil</b>	<p>A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time (Missouri Cooperative Soil Survey, online data).</p>																		
<b>Soil Association</b>	<p>A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit (Missouri Cooperative Soil Survey, online data).</p>																		
<b>Species</b>	<p>From Section 3(15) of the <i>Federal Endangered Species Act</i>: "The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." A population of individuals that are more or less alike, and that are able to breed and produce fertile offspring under natural conditions.</p>																		
<b>Stones</b>	<p>Rock fragments 10 to 24 inches in diameter (Missouri Cooperative Soil Survey, online data).</p>																		
<b>Threatened</b>	<p>The classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.</p>																		
<b>Till plain</b>	<p>An extensive area of nearly level to undulating soils underlain by glacial till (Missouri Cooperative Soil Survey, online data).</p>																		

<b>Topsoil</b>	The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining (Missouri Cooperative Soil Survey, online data).
<b>Upland</b>	Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams (Missouri Cooperative Soil Survey, online data).
<b>Vulnerability</b>	Susceptibility to injury or damage from hazards (Drabek and Hoetmer, 132).
<b>Vulnerability assessment</b>	The extent of injury and damages that may result from a hazard event of a given intensity in a given area (SEMA, <i>Regional Planning Commission Hazard Mitigation Planning Guide</i> ).
<b>Watershed</b>	The land area that drains water to a particular stream, river or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. Large watersheds, like the Missouri River basin, contain numerous smaller watersheds (USGS Water Resources of Georgia, online data).
<b>Water table</b>	The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone (Missouri Cooperative Soil Survey, online data).
<b>Weathering</b>	All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material (Missouri Cooperative Soil Survey, online data).

## **APPENDIX F: ONLINE PLANNING TOOLS**

### **List of Online Planning Tools for Plan Participants**

#### **Community Profile Survey**

online, web-based database tool

#### **School Profile Survey**

online, web-based database tool

#### **Jurisdiction Online Planning Tool (NEW)**

web-based access to local data to assist with plan review



# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 Community/School Profile

The Mid-America Regional Council is updating the 2015 Regional Multi-Hazard Mitigation Plan to assist cities, counties, school districts, colleges and universities and other special districts on the Missouri side of the Kansas City metro area.

The plan is important for local jurisdictions to identify hazards that pose a greater risk to lives and property, and to outline actions that could be taken to mitigate those risks. Adoption of the plan enables the local jurisdictions to be eligible to apply for certain FEMA grants.

To become an eligible signatory to the 2020 Plan, each jurisdiction must participate in the planning process, provide important information for the plan and identify action steps that the local jurisdiction is willing to take over the next five years.

**Please complete the profile by September 9, 2019.** Thank you for your participation.

Questions: Marlene Nagel, [mnagel@marc.org](mailto:mnagel@marc.org).

### RESOURCES

Below are a blank set of the questions in this application for your reference. These blank questions are intended to be used for collecting information from various parties to complete your profile.

[Community Profile Reference Copy](#) (pdf)

[School Profile Reference Copy](#) (pdf)

[Create New User](#)

[Log In To Account](#)

### INSTRUCTIONS & TIPS

- To get started, click on **Create New User** button; or
- If you have your credentials from the 2015 plan application, click the **Log in to Account** button.
  - Your 2015 information will pre-populate the application.
  - If you want a reference copy of your 2015 profile, go immediately to the Summary page and click on the Print Page button before you fill out the application with your 2020 update.
- When your 2020 profile is complete, from the Summary page click the Print Page button to print or PDF a copy for your internal records.

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**Kansas City, MO 64105**  
**816/474-4240**  
**Fax 816/421-7758**

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[Title VI policy](#) | [Americans with Disabilities Act resources](#)

**Questions?** Contact Marlene Nagel at [mnagel@marc.org](mailto:mnagel@marc.org)



# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Contact Information

[Log out](#)

Name of organization\*

School District? No

Contact person\*

Title

Phone\*

Email\*

Organization address\*

City\*

State\*

Zip code\*

[Update Info](#)

### Survey Progress

#### Part 1 - Hazard Identification

[Sections 1, 2, and 3](#) Not Completed

[Section 4](#) Not Completed

#### Part 2 - Local Capabilities Assessment

[A - Administrative and Technical Capabilities](#) Not Completed

[B - Financial Capabilities](#) Not Completed

[C - Education and Outreach Capabilities](#) Not Completed

[D - Planning and Regulatory Capabilities](#) Not Completed

#### Part 3 - Safe Growth Audit

[All Sections](#) Not Completed

#### Part 4 - National Flood Insurance Program (NFIP)

[All Sections](#) Not Completed

#### Summary of all sections

[View Summary.](#)

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Part 1 - Hazard Identification

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The 2015 Regional Multi-Hazard Mitigation Plan identified 17 natural and man-made hazards. The 2020 Plan will focus on five priority natural hazards as most relevant to our region: Tornadoes, Severe Thunderstorms, Floods (Flash, Riverine, Levee and Dam Failure), Severe Winter Weather, and Heat (Drought, Heat Waves).

1. Has your Local Emergency Management Agency conducted a Hazard Vulnerability Analysis?

Yes  No

2. Please indicate which of the following hazards described below affect your district by rating probability of occurrence and severity of impact in terms of: Low, Medium and High.

**Probability is defined as:**

**Low** – The hazard has little or no chance of happening (Less than 1 percent chance of occurrence in any given year.).

**Medium** – The hazard has a reasonable chance of occurring (Between 1 and 10 percent chance of occurrence in any given year.).

**High** – The probability is considered sufficiently high to assume that the event will occur (Between 10 and 100 percent chance of occurrence in any given year.).

**Severity is defined as:**

**Low** – Few or minor damage or injuries are likely

**Medium** – Injuries to personnel and damage to property and the environment is expected.

**High** – Deaths and major injuries and damage will likely occur.

Hazard	Probability	Severity	Changes since 2015 plan update	Describe your biggest concern in the form of a problem statement
Tornadoes	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Flooding	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Severe Thunderstorms	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Severe Winter Weather	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Drought	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Heat Waves	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Dam Failures	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>
Levee Failures (new)	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>	<input type="text"/>

3. Please list any additional hazards that require consideration and rate in terms of probability and severity as described above.

Hazard Probability Severity

<input type="text"/>	--Select-- ▼	--Select-- ▼
<input type="text"/>	--Select-- ▼	--Select-- ▼
<input type="text"/>	--Select-- ▼	--Select-- ▼

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 Community Profile

### Part 1 - Hazard Identification

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The 2015 Regional Multi-Hazard Mitigation Plan identified 17 natural and man-made hazards. The 2020 Plan will focus on five priority natural hazards as most relevant to our region: Tornadoes, Severe Thunderstorms, Floods (Flash, Riverine, Levee and Dam Failure), Severe Winter Weather, and Heat (Drought, Heat Waves).

4. Please describe any hazard events that occurred in your community during the past five years.

Hazard Type	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
--Select--	--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Brief Event Description:</b> <input type="text"/>						
--Select--	--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Brief Event Description:</b> <input type="text"/>						
--Select--	--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Brief Event Description:</b> <input type="text"/>						
--Select--	--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Brief Event Description:</b> <input type="text"/>						
--Select--	--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Brief Event Description:</b> <input type="text"/>						

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Part 2 - Local Capabilities Assessment

[Log out](#)

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete survey questions as completely as possible.

#### A. Administrative and Technical Capabilities

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local resources, indicate whether public resources at the next higher level of government can provide technical assistance.

1. Please identify administrative resources available to assist your community with mitigation efforts.

Administration	Is this function fulfilled at the local level?	Is assistance available from next level of government?
Planning and Zoning Commission	<input type="checkbox"/>	<input type="checkbox"/>
Mitigation Planning Committee	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance program to reduce risk (e.g. tree trimming, clearing drainage system)	<input type="checkbox"/>	<input type="checkbox"/>
Mutual aid agreement	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

2. Please identify staffing resources available to assist your community with mitigation efforts.

Staff	Is this staff role full-time or part-time at the local level?	Is staffing adequate to enforce regulations?	Trained on hazards and mitigation	Technical assistance available from next level of government?
Chief Building Official	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floodplain Administrator	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Manager	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community Planner	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Civil Engineer	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Health Official	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Support	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GIS Coordinator	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	--Select-- ▼	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Please identify technical resources available to assess and mitigate risk.

Technical	Is tool useful to meet local	Has your community used tool to	Describe measures incorporated into the HMP, if applicable.

planning assess/mitigate  
needs? risk?

Warning system/services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Hazard data and Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Critical Facilities Map/APRS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
HAZUS Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Existing Land Use Maps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Future Land Use Maps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
State Hazard Mitigation Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Grant Writing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 Community Profile

### Part 2 - Local Capabilities Assessment

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Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete survey questions as completely as possible.

#### B. Financial Capabilities

1. Please indicate whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility	Used in the past 5 years?	Type of mitigation activity funded	Can be used to fund future mitigation?
Capital Improvement Project Funding	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Authority to levy taxes for specific purpose	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Fees for water, sewer, gas or electric services	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Impact fees for new development	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Stormwater utility fee	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Incur debt through general and/or special tax bonds	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Incur debt through private activities	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Community Development Block Grant	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Flood Mitigation Assistance Program	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Pre-Disaster Mitigation Program	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Hazard Mitigation Grant Program	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	--Select--	<input type="checkbox"/>

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Part 2 - Local Capabilities Assessment

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Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete survey questions as completely as possible.

#### C. Education and Outreach Capabilities

1. Identify access to regional or local education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Useful to implement mitigation activities	Useful to communicate hazard-related information	Describe measures incorporated into the HMP, if applicable.
<b>Existing Warning Systems:</b>			
Storm Sirens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Mass Notification Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
CMAS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
MEMC Project Community Alert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
National Weather Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Kansas City Scout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
<b>Community Partnerships:</b>			
Regional Collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
SAVE Coalition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Kansas City Organizations Active in Disaster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Community Emergency Response Team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Medical Reserve Corps of Greater Kansas City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Ongoing public education or information program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Natural disaster or safety related school program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
StormReady certification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Public-private partnership initiatives (disaster related)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Media Coverage and Public Awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Part 2 - Local Capabilities Assessment

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Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete survey questions as completely as possible.

#### D. Planning and Regulatory Capabilities

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impact of hazards. Please indicate which of the following your jurisdiction has in place.

1. Please identify all plans with relevant measures to complement local mitigation efforts.

Plan	Year last updated or adopted	Does the plan address hazards?	Identifies projects to include in mitigation strategy?	Can be used to implement mitigation actions?	Describe measures incorporated into the HMP, if applicable.
Comprehensive/Master Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Capital Improvement Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Economic Development Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Local Emergency Operations Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Continuity of Operations Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Public Health Emergency Preparedness Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Transportation Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Stormwater Management Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Community Wildfire Protection Plan	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Brownfields Redevelopment	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Climate Change Adaption	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

2. Please identify all building and fire codes your community has adopted by series, version and/or year, applicable ratings or scores, and adequate enforcement.

Code	Series	Year	BCEGS* (ISO) Score	Is the code adequately enforced?	Describe measures incorporated into the HMP, if applicable.
Building Code	--Select-- ▾	<input type="text"/>	--Select-- ▾	<input type="checkbox"/>	<input type="text"/>
Fire Code	--Select-- ▾	<input type="text"/>	--Select-- ▾	<input type="checkbox"/>	<input type="text"/>
Mechanical Code	--Select-- ▾	<input type="text"/>	--Select-- ▾	<input type="checkbox"/>	<input type="text"/>
Plumbing Code	--Select-- ▾	<input type="text"/>	--Select-- ▾	<input type="checkbox"/>	<input type="text"/>
Dangerous Building Code	--Select-- ▾	<input type="text"/>	--Select-- ▾	<input type="checkbox"/>	<input type="text"/>

Other






\* Building Code Effectiveness Grading Schedule.

Codes

- |                                     |   |   |
|-------------------------------------|---|---|
| IC - International Code             | IPMC - International Property Maintenance Code            | UCBC - Uniform Code for Building Construction |
| IBC - International Building Code   | IRC - International Residential Code                      | UHC - Uniform Housing Code                    |
| IFC - International Fire Code       | NEC - National Electric Code                              | UMC - Uniform Mechanical Code                 |
| IFGC - International Fuel Gas Code  | NFC - National Fire Code                                  | UPC - Uniform Plumbing Code                   |
| IMC - International Mechanical Code | UBC - Uniform Building Code                               | URC - Uniform Residential Code                |
| IPC - International Plumbing Code   | UCADB - Uniform Code for Abatement of Dangerous Buildings | USC - Uniform Sign Code                       |

3. Please identify all relevant land use planning policies and ordinances and if the ordinance is an effective measure to reduce natural hazard impacts, and if the ordinance is adequately administered and enforced.

Natural Hazard Mitigation Ordinance/Policy	Adopted?	Is measure an effective tool to mitigate hazard?	Are resources available to adequately administer?	Is ordinance adequately enforced?	Describe measures incorporated into the HMP, if applicable.
Stream setback ordinances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Floodplain management ordinances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Soil and erosion ordinances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Burn ordinance (i.e., farmland, prairie, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Stormwater runoff ordinances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Water conservation measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Open space acquisition/dedication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Flood buyout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Site plan review requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 Community Profile

### Part 3 - Safe Growth Audit

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Identify gaps in your community's growth guidance instruments and improvements that could be made to reduce vulnerability to future development.

Please answer all nine sections (A-I) to the best of your ability.

#### Comprehensive Plan Components:

##### A. Land Use

1. Do the land use policies define an urban services area?

Yes  No

2. Do the land use policies contain provisions for hazard zone identification?

Yes  No

3. Do the land use policies discourage development or redevelopment within natural hazard areas?

Yes  No

4. Does the future land use map clearly identify natural hazard areas?

Yes  No

5. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?

Yes  No

6. Do the land use policies require storm water engineering studies prior to development?

Yes  No

7. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

##### B. Transportation

1. Does the transportation plan limit access to hazard areas?

Yes  No

2. Is transportation policy used to guide growth to safe locations?

Yes  No

3. Are movement systems designed to function under disaster conditions (e.g., evacuation)?



Yes  No

4. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

### C. Environmental Management

1. Are environmental systems that protect development from hazards identified and mapped?

Yes  No

2. Do environmental policies maintain and restore protective ecosystems?

Yes  No

3. Do environmental policies provide incentives to development located outside protective ecosystems?

Yes  No

4. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

### D. Public Safety

1. Are the goals and policies of the comprehensive plan related to those of the HMP?

Yes  No

2. Is safety explicitly included in the plan's growth and development policies?

Yes  No

3. Does the monitoring and implementation section of the plan cover safe growth objectives?

Yes  No

4. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

### E. Building Codes

1. Does the building code contain provisions to elevate construction to withstand hazard forces?

Yes  No

2. Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?

Yes  No

3. Does the building code contain safe room or storm shelter requirements?

Yes  No

4. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

#### **F. Zoning Ordinance**

1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?

Yes  No

2. Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?

Yes  No

3. Does the zoning ordinance contain mitigation performance standards?

Yes  No

4. Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?

Yes  No

5. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?

Yes  No

6. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

#### **G. Subdivision Regulations**

1. Do the subdivision regulations contain an adopted hazard disclosure?

Yes  No

2. Do subdivision regulations contain a provision for soil report evaluations?

Yes  No

3. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?

Yes  No

4. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?

Yes  No

5. Do the regulations allow density transfers where hazards exist?

Yes  No

6. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

#### **H. Capital Improvement Program and Infrastructure Policies**

1. Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?

Yes  No

2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?

Yes  No

3. Does the capital improvement program provide funding for hazard mitigation projects?

Yes  No

4. Describe measures incorporated into the hazard mitigation plan:

(500 characters or less)

**I. Other**

1. Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards?

Yes  No

2. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?

Yes  No

3. Do economic development or redevelopment strategies include provisions for mitigation of natural resources?

Yes  No

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 Community Profile

### Part 4 - National Flood Insurance Program (NFIP)

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Participation in the NFIP is based on an agreement between communities and FEMA. The NFIP has three basic components: Floodplain Mapping, Floodplain Management, and Flood Insurance.

Please document your community's participation and continued compliance with the NFIP.

#### A. Compliance

1. Does your community participate in the NFIP?

Yes  No

2. Is your community in good standing with the NFIP?

Yes  No

3. Are there any outstanding compliance issues (i.e., current violations)?

Yes  No

4. Have you had a Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?

Yes  No

#### B. Staff Resources

1. Does your community have dedicated staff to manage your NFIP participation?

2. Is floodplain management an auxiliary (additional, supplemental) function?

Yes  No

3. Indicate your community's NFIP administration services in terms of effectiveness for the following functions:

NFIP Administrative Service	Effective	Needs Improvement
Permit Review	<input type="checkbox"/>	<input type="checkbox"/>
GIS	<input type="checkbox"/>	<input type="checkbox"/>
Education/Outreach	<input type="checkbox"/>	<input type="checkbox"/>
Inspections	<input type="checkbox"/>	<input type="checkbox"/>
Enforcement	<input type="checkbox"/>	<input type="checkbox"/>
Engineering	<input type="checkbox"/>	<input type="checkbox"/>

#### C. Regulatory

1. When did your community enter the NFIP?

2. Are the FIRMs digital or paper?

3. Do floodplain development regulations meet or exceed FEMA or State minimum requirements?

4. Briefly explain the permitting process:

(500 characters or less)

**D. Insurance Summary**

1. How many NFIP policies are in your community, if known?
2. How many claims have been paid in your community, if known?
3. What is the total amount of paid claims, if known?
4. How many of the claims were for substantial damage, if known?
5. How many structures are exposed to flood risk within your community?
6. Do any areas of flood risk in your community have limited NFIP policy coverage?  
 Yes  No
7. If yes, are these areas of flood risk clearly marked or documented?  
 Yes  No

**E. Community Rating System (this section applies to current CRS participants, including Kansas City, Independence and Platte County.**

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.

1. Does your community participate in CRS?  
 Yes  No
2. What is your community's current CRS Class Rating?
3. Please identify activities included in your community's current CRS Class Rating and indicate those activities recently improved and/or scheduled to be improved within the next five years

Action	Included	Improved	Scheduled
<b>300 Public Information Activities</b>			
310 Elevation Certificates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
320 Map Information Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
330 Outreach Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
340 Hazard Disclosure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
350 Flood Protection Information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
360 Flood Protection Assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
370 Flood Insurance Promotion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>400 Mapping &amp; Regulations</b>			
410 Floodplain Mapping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
420 Open Space Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
430 Higher Regulatory Standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
440 Flood Data Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
450 Stormwater Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>500 Flood Damage Reduction Activities</b>			
510 Floodplain Mgmt. Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
520 Acquisition and Relocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
530 Flood Protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
540 Drainage System Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**600 Warning and Response**

- 610 Flood Warning and Response
- 620 Levees
- 630 Dams

4. Does your community's multi-hazard mitigation planning effort satisfy the CRS planning requirements?

Yes  No

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## Summary of

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### Contact Information

[Print page](#)

Organization:

Contact person:

Title:

Phone:

E-mail:

Organization address:

, MO

## Part 1 - Hazard Identification

1. Has your Local Emergency Management Agency conducted a Hazard Vulnerability Analysis? No

2. Please indicate which of the following hazards described below affect your district by rating probability of occurrence and severity of impact in terms of: Low, Medium and High.

Hazard	Probability	Severity	Changes since 2010 plan update	If not applicable to your community, please explain why.
Tornadoes	N/A	N/A	No	
Flooding	N/A	N/A	No	
Severe Thunderstorms	N/A	N/A	No	
Severe Winter Weather	N/A	N/A	No	
Drought	N/A	N/A	No	
Heat Waves	N/A	N/A	No	
Dam Failures	N/A	N/A	No	
Levee Failures (new)	N/A	N/A	No	

3. Please describe any hazard events that occurred in your community during the past five years.

Hazard Type	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
--Select--	N/A					
<b>Event Description:</b>						
--Select--	N/A					
<b>Event Description:</b>						
--Select--	N/A					
<b>Event Description:</b>						
--Select--	N/A					

**Event Description:**

--Select--

N/A

**Event Description:**

## Part 2 - Local Capabilities Assessment

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

### A. Administrative and Technical Capabilities

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local resources, indicate whether public resources at the next higher level of government can provide technical assistance.

1. Please identify administrative resources available to assist your community with mitigation efforts.

Administration	Is this function fulfilled at the local level?	Is assistance available from next level of government?	Is coordination between governments effective for mitigation purposes?	Reviewed for HMP update?
Planning and Zoning Commission	No	No		
Mitigation Planning Committee	No	No		
Maintenance program to reduce risk (e.g. tree trimming, clearing drainage system)	No	No		
Mutual aid agreement	No	No		
Other	No	No		

2. Please identify staffing resources available to assist your community with mitigation efforts.

Staff	Is this staff role full-time or part-time at the local level?	Is staffing adequate to enforce regulations?	Trained on hazards and mitigation	Technical assistance available from next level of government?	Coordination between staff and agencies effective?	Reviewed for HMP update?
Chief Building Official	N/A	No	No	No		
Floodplain Administrator	N/A	No	No	No		
Emergency Manager	N/A	No	No	No		
Community Planner	N/A	No	No	No		
Civil Engineer	N/A	No	No	No		
Public Health Official	N/A	No	No	No		
IT Support	N/A	No	No	No		
GIS Coordinator	N/A	No	No	No		
Other	N/A	No	No	No		

3. Please identify technical resources available to assess and mitigate risk.

Technical	Is tool useful to meet local planning needs?	Has your community used tool to assess/mitigate risk?	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
Warning system/services	No	No		



Hazard data and Information	No	No
Critical Facilities Map/APRS	No	No
HAZUS Analysis	No	No
Existing Land Use Maps	No	No
Future Land Use Maps	No	No
State Hazard Mitigation Plan	No	No
Grant Writing	No	No
Other	No	No

## B. Financial Capabilities

1. Please indicate whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility	Used in the past 5 years?	Type of mitigation activity funded	Can be used to fund future mitigation?	Reviewed for HMP update?
Capital Improvement Project Funding	No	No	N/A	No	
Authority to levy taxes for specific purpose	No	No	N/A	No	
Fees for water, sewer, gas or electric services	No	No	N/A	No	
Impact fees for new development	No	No	N/A	No	
Stormwater utility fee	No	No	N/A	No	
Incur debt through general and/or special tax bonds	No	No	N/A	No	
Incur debt through private activities	No	No	N/A	No	
Community Development Block Grant	No	No	N/A	No	
Flood Mitigation Assistance Program	No	No	N/A	No	
Pre-Disaster Mitigation Program	No	No	N/A	No	
Hazard Mitigation Grant Program	No	No	N/A	No	
Other	No	No	N/A	No	

## C. Education and Outreach Capabilities

1. Identify access to regional or local education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Useful to implement mitigation activities	Useful to communicate hazard- related information	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
<b>Existing Warning Systems:</b>				
Storm Sirens	No	No		
Mass Notification Systems	No	No		
CMAS	No	No		
MEMC Project Community Alert	No	No		
National Weather Service	No	No		
Kansas City Scout	No	No		
<b>Community Partnerships:</b>				
Regional Homeland Security Coordinating Committee	No	No		

Metropolitan Emergency Managers Committee		
Mid-America Local Emergency Planning Committee		
Mid-America Regional Council Emergency Rescue Committee		
Metropolitan Official Health Agencies of the Kansas City Area		
Regional 9-1-1 System		
SAVE Coalition	No	No
Kansas City Organizations Active in Disaster	No	No
Community Emergency Response Team	No	No
Medical Reserve Corps of Greater Kansas City	No	No
Successful Small Cities: A Technical Tool Kit		
Water Natural Resources Protection (NRI, WRP3)		
Storm Shelter Model Ordinance		
Ongoing public education or information program	No	No
Natural disaster or safety related school program	No	No
StormReady certification	No	No
Firewise Communities certification		
Public-private partnership initiatives (disaster related)	No	No
Media Coverage and Public Awareness	No	No

### D. Planning and Regulatory Capabilities

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impact of hazards. Please indicate which of the following your jurisdiction has in place.

1. Please identify all plans with relevant measures to complement local mitigation efforts.

Plan	Year last updated or adopted	Does the plan address hazards?	Identifies projects to include in mitigation strategy?	Can be used to implement mitigation actions?	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
Comprehensive/Master Plan		No	No	No		
Capital Improvement Plan		No	No	No		
Economic Development Plan		No	No	No		
Local Emergency Operations Plan		No	No	No		
Continuity of Operations Plan		No	No	No		
Public Health Emergency Preparedness Plan		No	No	No		
Transportation Plan		No	No	No		
Stormwater Management Plan		No	No	No		
Community Wildfire Protection Plan		No	No	No		
Brownfields Redevelopment		No	No	No		
Climate Change Adaption		No	No	No		

2. Please identify all building and fire codes your community has adopted by series, version and/or year, applicable ratings or scores, and adequate enforcement.

Code	Series	Year	BCEGS*	Is the code	Reviewed	Describe measures incorporated into
------	--------	------	--------	-------------	----------	-------------------------------------

		(ISO) Score	adequately enforced?	for HMP update?	the HMP, if applicable.
Building Code	N/A	N/A	No		
Fire Code	N/A	N/A	No		
Mechanical Code	N/A	N/A	No		
Plumbing Code	N/A	N/A	No		
Dangerous Building Code	N/A	N/A	No		
Other	N/A	N/A	No		

\* Building Code Effectiveness Grading Schedule.

Codes

IC - International Code	IPMC - International Property Maintenance Code	UCBC - Uniform Code for Building Construction
IBC - International Building Code	IRC - International Residential Code	UHC - Uniform Housing Code
IFC - International Fire Code	NEC - National Electric Code	UMC - Uniform Mechanical Code
IFGC - International Fuel Gas Code	NFC - National Fire Code	UPC - Uniform Plumbing Code
IMC - International Mechanical Code	UBC - Uniform Building Code	URC - Uniform Residential Code
IPC - International Plumbing Code	UCADB - Uniform Code for Abatement of Dangerous Buildings	USC - Uniform Sign Code

3. Please identify all relevant land use planning policies and ordinances and if the ordinance is an effective measure to reduce natural hazard impacts, and if the ordinance is adequately administered and enforced.

Natural Hazard Mitigation Ordinance/Policy	Adopted?	Is measure an effective tool to mitigate hazard?	Are resources available to administer?	Is ordinance adequately enforced?	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
Stream setback ordinances	No	No	No	No		
Floodplain management ordinances	No	No	No	No		
Soil and erosion ordinances	No	No	No	No		
Burn ordinance (i.e., farmland, prairie, etc.)	No	No	No	No		
Stormwater runoff ordinances	No	No	No	No		
Water conservation measures	No	No	No	No		
Open space acquisition/dedication	No	No	No	No		
Flood buyout	No	No	No	No		
Site plan review requirements	No	No	No	No		
Other	No	No	No	No		

## Part 3 - Safe Growth Audit

Identify gaps in your community's growth guidance instruments and improvements that could be made to reduce vulnerability to future development.

**Comprehensive Plan Components:**

### A. Land Use

- 1. Do the land use policies define an urban services area? No
- 2. Do the land use policies contain provisions for hazard zone identification? No
- 3. Do the land use policies discourage development or redevelopment within natural hazard areas? No
- 4. Does the future land use map clearly identify natural hazard areas? No

- |   |    |
|---|----|
| 5. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas? | No |
| 6. Do the land use policies require storm water engineering studies prior to development?                         | No |
| 7. Describe measures incorporated into the hazard mitigation plan:  |    |

## B. Transportation

- |  |    |
|--|----|
| 1. Does the transportation plan limit access to hazard areas?                              | No |
| 2. Is transportation policy used to guide growth to safe locations?                        | No |
| 3. Are movement systems designed to function under disaster conditions (e.g., evacuation)? | No |
| 4. Describe measures incorporated into the hazard mitigation plan:                         |    |

## C. Environmental Management

- |   |    |
|---|----|
| 1. Are environmental systems that protect development from hazards identified and mapped?             | No |
| 2. Do environmental policies maintain and restore protective ecosystems?                              | No |
| 3. Do environmental policies provide incentives to development located outside protective ecosystems? | No |
| 4. Describe measures incorporated into the hazard mitigation plan:                                    |    |

## D. Public Safety

- |   |    |
|---|----|
| 1. Are the goals and policies of the comprehensive plan related to those of the HMP?        | No |
| 2. Is safety explicitly included in the plan's growth and development policies?             | No |
| 3. Does the monitoring and implementation section of the plan cover safe growth objectives? | No |
| 4. Describe measures incorporated into the hazard mitigation plan:                          |    |

## E. Building Codes

- |   |    |
|---|----|
| 1. Does the building code contain provisions to elevate construction to withstand hazard forces?                    | No |
| 2. Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces? | No |
| 3. Does the building code contain safe room or storm shelter requirements?  | No |
| 4. Describe measures incorporated into the hazard mitigation plan:  |    |

## F. Zoning Ordinance

- |   |    |
|---|----|
| 1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas? | No |
| 2. Does the ordinance contain natural hazard overlay zones or districts that set conditions for land use within such zones?                       | No |
| 3. Does the zoning ordinance contain mitigation performance standards?  | No |
| 4. Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?   | No |
| 5. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?              | No |
| 6. Describe measures incorporated into the hazard mitigation plan:  |    |

## G. Subdivision Regulations

- |   |    |
|---|----|
| 1. Do the subdivision regulations contain an adopted hazard disclosure?   | No |
| 2. Do subdivision regulations contain a provision for soil report evaluations?  | No |
| 3. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?                    | No |
| 4. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources? | No |
| 5. Do the regulations allow density transfers where hazards exist?  | No |
| 6. Describe measures incorporated into the hazard mitigation plan:  |    |

## H. Capital Improvement Program and Infrastructure Policies

1. Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards? No
2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards? No
3. Does the capital improvement program provide funding for hazard mitigation projects? No
4. Describe measures incorporated into the hazard mitigation plan:

## I. Other

1. Do small area or corridor plans recognize the need to avoid or to mitigate natural hazards? No
2. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards? No
3. Do economic development or redevelopment strategies include provisions for mitigation of natural resources? No

## Part 4 - National Flood Insurance Program (NFIP)

Participation in the NFIP is based on an agreement between communities and FEMA. The NFIP has three basic components: Floodplain Mapping, Floodplain Management, and Flood Insurance.

Please document your community's participation and continued compliance with the NFIP.

## A. Compliance

1. Does your community participate in the NFIP? No
  2. Please describe reasons for non-participation:
- 

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 Community/School Profile

The Mid-America Regional Council is updating the 2015 Regional Multi-Hazard Mitigation Plan to assist cities, counties, school districts, colleges and universities and other special districts on the Missouri side of the Kansas City metro area.

The plan is important for local jurisdictions to identify hazards that pose a greater risk to lives and property, and to outline actions that could be taken to mitigate those risks. Adoption of the plan enables the local jurisdictions to be eligible to apply for certain FEMA grants.

To become an eligible signatory to the 2020 Plan, each jurisdiction must participate in the planning process, provide important information for the plan and identify action steps that the local jurisdiction is willing to take over the next five years.

**Please complete the profile by September 9, 2019.** Thank you for your participation.

Questions: Marlene Nagel, [mnagel@marc.org](mailto:mnagel@marc.org).

### RESOURCES

Below are a blank set of the questions in this application for your reference. These blank questions are intended to be used for collecting information from various parties to complete your profile.

[Community Profile Reference Copy](#) (pdf)

[School Profile Reference Copy](#) (pdf)

[Create New User](#)

[Log In To Account](#)

### INSTRUCTIONS & TIPS

- To get started, click on **Create New User** button; or
- If you have your credentials from the 2015 plan application, click the **Log in to Account** button.
  - Your 2015 information will pre-populate the application.
  - If you want a reference copy of your 2015 profile, go immediately to the Summary page and click on the Print Page button before you fill out the application with your 2020 update.
- When your 2020 profile is complete, from the Summary page click the Print Page button to print or PDF a copy for your internal records.

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 School Profile

### Contact Information

[Log out](#)

Name of organization\*

School District? Yes

Contact person\*

Title

Phone\*

Email\*

Organization address\*

City\*

State\*

Zip code\*

### Survey Progress

<a href="#">Part 1 - Hazard Identification</a>	Not Completed
<a href="#">Part 1 - Hazard Identification - Section 4</a>	Not Completed
<a href="#">Part 2 - Plans Related to Hazard Mitigation</a>	Not Completed
<a href="#">Part 3 - Mitigation Activities</a>	Not Completed
<a href="#">Part 4: FEMA Grants</a>	Not Completed
<a href="#">Part 5 - Technical Documents</a>	Not Completed
<b>Summary of all sections</b>	
<a href="#">View Summary</a>	

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 School Profile

### Part 1 - Hazard Identification

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The 2015 Regional Multi-Hazard Mitigation Plan identified 17 natural and man-made hazards. The 2020 Plan will focus on five priority natural hazards as most relevant to our region: Tornadoes, Severe Thunderstorms, Floods (Flash, Riverine, Levee and Dam Failure), Severe Winter Weather, and Heat (Drought, Heat Waves).

1. Has your district/facility conducted a Hazard Vulnerability Analysis?

Yes  No

2. Please indicate which of the hazards described below affect your district/facility by rating probability of occurrence and severity of impact in terms of: Low, Medium and High.

**Probability is defined as:**

**Low** – The hazard has little or no chance of happening (Less than 1 percent chance of occurrence in any given year.).

**Medium** – The hazard has a reasonable chance of occurring (Between 1 and 10 percent chance of occurrence in any given year.).

**High** – The probability is considered sufficiently high to assume that the event will occur (Between 10 and 100 percent chance of occurrence in any given year.).

**Severity is defined as:**

**Low** – Few or minor damage or injuries are likely

**Medium** – Injuries to personnel and damage to property and the environment is expected.

**High** – Deaths and major injuries and damage will likely occur.

Hazard	Probability	Severity	Changes since last plan update
Tornadoes	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Flooding	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Severe Thunderstorms	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Severe Winter Weather	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Drought	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Heat Waves	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Dam Failures	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>
Levee Failures (new)	--Select-- ▼	--Select-- ▼	<input type="checkbox"/>

3. Please list any additional school-specific hazards that require consideration and rate in terms of probability and severity as described above.

Hazard	Probability	Severity
<input type="text"/>	--Select-- ▼	--Select-- ▼
<input type="text"/>	--Select-- ▼	--Select-- ▼
<input type="text"/>	--Select-- ▼	--Select-- ▼



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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 School Profile

### Part 1 - Hazard Identification

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The 2015 Regional Multi-Hazard Mitigation Plan identified 17 natural and man-made hazards. The 2020 Plan will focus on five priority natural hazards as most relevant to our region: Tornadoes, Severe Thunderstorms, Floods (Flash, Riverine, Levee and Dam Failure), Severe Winter Weather, and Heat (Drought, Heat Waves).

4. Please describe any hazard events that occurred in your district during the past five years.

Hazard Type	Date	Deaths	Injuries	Property Damage	Brief Event Description
--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
--Select--	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

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# 2020 Regional Multi-Hazard Mitigation Plan

## Community/School Profile



## 2020 School Profile

### Part 2 - Plans Related to Hazard Mitigation

[Log out](#)

Plans, policies or codes that prevent and reduce the impacts of hazards.

1. Has your district/facility adopted any of the following plans related to hazard mitigation? Add other plans or policies, if applicable.

Plan	Have you adopted the plan?	Identifies projects to include in mitigation strategy?	Can be used to implement mitigation actions?	Describe measures incorporated into the HMP, if applicable.
Evacuation Plans (fire, flooding, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Storm Sheltering Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Shelter-in-Place Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Infectious Disease Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Water Conservation Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Security Plan (intruder, lockdown, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
<b>Other Plans (Please describe)</b>				
<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

2. Has your district/facility updated your building codes?

Yes  No

3. Does the building code contain provisions to elevate construction to withstand hazard forces?

Yes  No

4. Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces?

Yes  No

5. Does the building code contain safe room or storm shelter requirements?

Yes  No

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 School Profile

### Part 3 - Mitigation Activities

[Log out](#)

1. Please list any mitigation activities your district/facility has participated in over the previous five years to reduce the damaging effects from natural or other hazards. For instance, "Installed surveillance equipment."

Mitigation Activity	Participated in activity during the past five years?	Describe measures incorporated into the HMP, if applicable.
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 School Profile

### Part 4 - FEMA Grants

[Log out](#)

1. Please describe all FEMA mitigation grants applied for or received during the past five years:

Grant project title	Grant program	Was a grant application submitted?	Was application approved?
<input type="text"/>	--Select-- <input type="button" value="v"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Briefly describe the grant purpose:</b>			
<input type="text"/>			
<b>Describe how measures were incorporated into the hazard mitigation plan, if applicable:</b>			
<input type="text"/>			

Grant project title	Grant program	Was a grant application submitted?	Was application approved?
<input type="text"/>	--Select-- <input type="button" value="v"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Briefly describe the grant purpose:</b>			
<input type="text"/>			
<b>Describe how measures were incorporated into the hazard mitigation plan, if applicable:</b>			
<input type="text"/>			

Grant project title	Grant program	Was a grant application submitted?	Was application approved?
<input type="text"/>	--Select-- <input type="button" value="v"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Briefly describe the grant purpose:</b>			
<input type="text"/>			
<b>Describe how measures were incorporated into the hazard mitigation plan, if applicable:</b>			
<input type="text"/>			

Grant project title	Grant program	Was a grant application submitted?	Was application approved?
<input type="text"/>	--Select-- <input type="button" value="v"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Briefly describe the grant purpose:</b>			
<input type="text"/>			
<b>Describe how measures were incorporated into the hazard mitigation plan, if applicable:</b>			
<input type="text"/>			

Grant project title	Grant program	Was a grant application submitted?	Was application approved?
<input type="text"/>	--Select-- <input type="button" value="v"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Briefly describe the grant purpose:</b>			
<input type="text"/>			
<b>Describe how measures were incorporated into the hazard mitigation plan, if applicable:</b>			
<input type="text"/>			

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## 2020 School Profile

### Part 5 - Technical Documents

[Log out](#)

1. Please indicate if your district/facility has reviewed the state hazard mitigation plan.

Yes  No

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# 2020 Regional Multi-Hazard Mitigation Plan Community/School Profile



## Summary of Contact Information

[Log out](#)

[Print page](#)

Organization:  
 Contact person:  
 Title:  
 Phone:  
 E-mail:  
 Organization address:

, MO

## Hazard Identification

1. Has your district/facility conducted a Hazard Vulnerability Analysis? **No**
2. Please indicate which of the hazards described below affect your district/facility by rating probability of occurrence and severity of impact in terms of: Low, Medium and High.

Hazard	Probability	Severity	Changes since 2010 plan update
Tornadoes	N/A	N/A	No
Flooding	N/A	N/A	No
Severe Thunderstorms	N/A	N/A	No
Severe Winter Weather	N/A	N/A	No
Drought	N/A	N/A	No
Heat Waves	N/A	N/A	No
Dam Failures	N/A	N/A	No
Levee Failures (new)	N/A	N/A	No

4. Please describe any hazard events that occurred in your district during the past five years.

Hazard Type	Date	Deaths	Injuries	Property Damage	Brief Event Description
--Select--					
--Select--					
--Select--					
--Select--					
--Select--					

## Part 2 - Plans Related to Hazard Mitigation

Plans, policies or codes that prevent and reduce the impacts of hazards.

1. Has your district/facility adopted any of the following plans related to hazard mitigation?

Plan	Have you adopted the plan?	Identifies projects to include in mitigation strategy?	Can be used to implement mitigation actions?	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
Evacuation Plans (fire, flooding, etc.)	No	No	No		
Storm Sheltering Plan	No	No	No		
Shelter-in-Place Plan	No	No	No		
Infectious Disease Plan	No	No	No		
Water Conservation Measures	No	No	No		
Security Plan (intruder, lockdown, etc.)	No	No	No		
<b>Other Plans (Please describe)</b>					
	No	No	No		
	No	No	No		
	No	No	No		

- 2. Has your district/facility updated your building codes? No
- 3. Does the building code contain provisions to elevate construction to withstand hazard forces? No
- 4. Does the building code contain wind resistance provisions to strengthen construction to withstand hazard forces? No
- 5. Does the building code contain safe room or storm shelter requirements? No

## Part 3 - Mitigation Activities

1. Please list any mitigation activities your district/facility has participated in over the previous five years to reduce the damaging effects from natural or other hazards. For instance, "Installed surveillance equipment."

Mitigation Activity	Participated in activity during the past five years?	Reviewed for HMP update?	Describe measures incorporated into the HMP, if applicable.
	No		
	No		
	No		
	No		
	No		
	No		
	No		
	No		
	No		

## Part 4 - FEMA Grants

1. Please describe all FEMA mitigation grants applied for or received during the past five years:

Grant project title	Grant program	Was a grant application submitted?	Was application approved?	Reviewed for HMP update?
		No	No	

**Briefly describe the grant purpose:**

**Describe how measures were incorporated into the hazard mitigation plan, if applicable:**

---

Grant project title	Grant program	Was a grant application submitted?	Was application approved?	Reviewed for HMP update?
		No	No	

**Briefly describe the grant purpose:**

**Describe how measures were incorporated into the hazard mitigation plan, if applicable:**

---

Grant project title	Grant program	Was a grant application submitted?	Was application approved?	Reviewed for HMP update?
		No	No	

**Briefly describe the grant purpose:**

**Describe how measures were incorporated into the hazard mitigation plan, if applicable:**

---

Grant project title	Grant program	Was a grant application submitted?	Was application approved?	Reviewed for HMP update?
		No	No	

**Briefly describe the grant purpose:**

**Describe how measures were incorporated into the hazard mitigation plan, if applicable:**

---

Grant project title	Grant program	Was a grant application submitted?	Was application approved?	Reviewed for HMP update?
		No	No	

**Briefly describe the grant purpose:**

**Describe how measures were incorporated into the hazard mitigation plan, if applicable:**

---

## Part 5 - Technical Documents

1. Please indicate if your district/facility has reviewed the state hazard mitigation plan. No

---

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# Appendix F

## Jurisdiction Online Planning Tool

Web-based pages allow jurisdiction to access profile capabilities, risk assessment, hazard mapping, hazard-specific resources, and ability to review and update mitigation goals and actions. Screenshots of Profile, Assessment, Map, Resources and Goals & Actions are included as a sample tool.



### 2020 Regional Multi-Hazard Mitigation Plan

Profile

Assessment

Map

Resources

Goals & Actions

Kansas City MO



#### Instructions

This application filters information in two ways: by jurisdiction and by hazard. Using your secure code link, your jurisdiction's entire data set is visible across the pages unless you filter the data by hazard. To filter the data by hazard, click on a hazard icon. It will stay highlighted and only that hazard's data will appear across the pages (where applicable) for your jurisdiction. To go back to the combined view, unclick the hazard.

The following is a quick guide for the content at each navigation tab:

**Profile:** Displays the summary data from your Community/School Profile for all of the hazards.

**Assessment:** Relevant data for each hazard is displayed here, including population, demographic and vulnerable populations data.

**Map:** Your jurisdiction's map and projection of what might be impacted when a hazard strikes. Each hazard has its own map, so click on the maps tab and then click the hazard icons to see a detailed map for each hazard.

**Resources:** General information about all five hazards in the Kansas City region.

**Goals & Actions:** Your goals and actions from the 2015 Hazard Mitigation Plan documents.

Submit  
feedback about  
the app

## Administrative and Technical Capabilities

<b>Staff</b>	<b>Full/Part-Time</b>
Chief Building Official	Part time
Floodplain Administrator	Full time
Emergency Manager	Full time
Community Planner	Part time
Civil Engineer	Full time
Public Health Official	Full time
IT Support	Full time
GIS Coordinator	Full time
<b>Technical</b>	<b>Available</b>
Warning System/Services	Yes
Hazard Data and Information	Yes
HAZUS Analysis	Yes
Existing Land Use Maps	Yes
Future Land Use Maps	Yes
State Hazard Mitigation Plan	Yes
Critical Facilities Map/APRS	Yes

## Financial Capabilities

<b>Source</b>	<b>Available</b>
Capital Improvement Project Funding	Yes
Authority to Levy Taxes for Specific Purpose	Yes
Fees for Water, Sewer, Gas or Electric Services	Yes
Impact Fees for New Development	No
Stormwater Utility Fee	Yes
Flood Mitigation Assistance Program	Yes
Pre-Disaster Mitigation Program	No
Hazard Mitigation Grant Program	No

## Education and Outreach

<b>Existing Warning Systems</b>	<b>Available</b>
Storm Sirens	Yes
Mass Notification Systems	Yes
<b>Community Partnerships</b>	<b>Available</b>
Kansas City Organizations Active in Disaster	Yes
Community Emergency Response Team	Yes
Ongoing Public Education or Information Program	Yes
Natural Disaster or Safety Related School Program	No
Media Coverage and Public Awareness	Yes

## Planning and Regulatory Capabilities

## Kansas City MO



### Risks

#### Tornadoes

Number of Schools	193
Number of Nursing Homes	72
Number of Childcare Centers	231
Number of Apartment Complexes	1,524
Number of Hazardous Materials locations	451
Tornado events in past 5 years (NOAA)	0

#### Severe Thunderstorm

Severe thunderstorms in past 5 years (NOAA)	124
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#### Floods

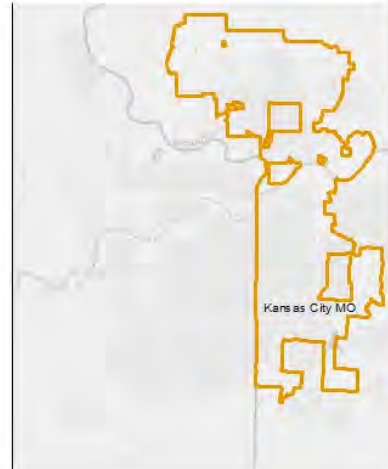
Buildings in floodplain	6,408
Commercial property in floodplain (parcels)	1,439
Commercial property in floodplain (area)	Unknown
Residential property in floodplain (parcels)	1,658
Residential property in floodplain (value)	\$4,182,902,712
Residential property in floodplain (area)	0.0 Acres
Hazardous materials locations in floodplain	121
Dams	32
Flood events in past 5 years (NOAA)	66

#### Severe Winter Weather

Warming Centers	26
Severe winter weather in past 5 years (NOAA)	1

#### Heat

Cooling Centers	27
Heat related events in past 5 years (NOAA)	0



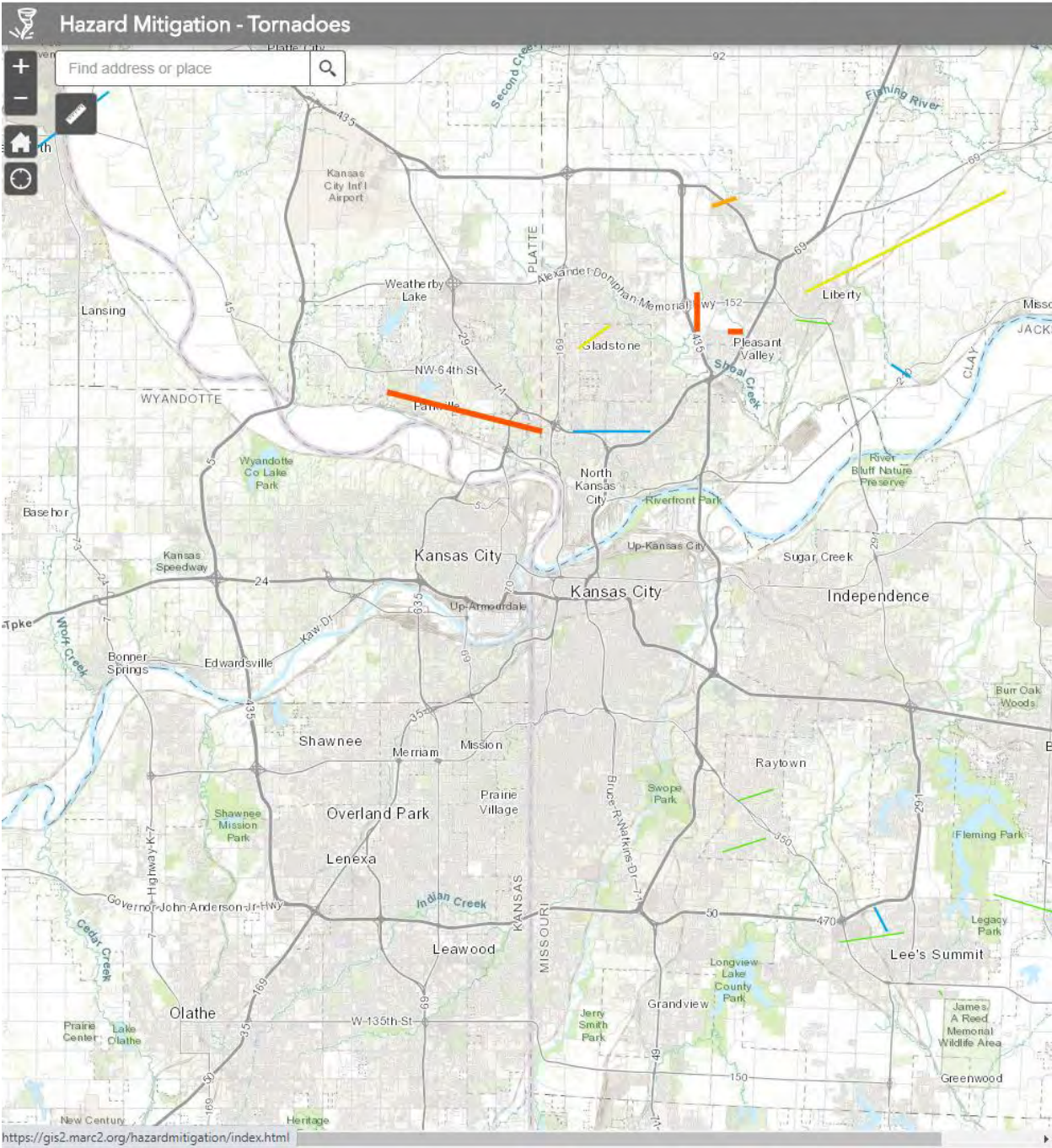
### Things to Consider

#### Tornadoes

##### Building and Construction



## Kansas City MO





## Kansas City MO



### 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. 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. 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 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. 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 a injuring or killing people through the force of their impact.



A total of 18 tornado events since the last plan update occurred on eight specific dates: May 16, 2015 \* July 1, 2015 \* September 18, 2015 \* March 6, 2017 \* June 26, 2018 \* July 6, 2017 \* May 2, 2018 \* October 9, 2018

[More information on Tornadoes in the region»](#)

### Grants Information

[FEMA Grant announcement for disaster declaration State of Missouri Hazard Mitigation funding, August 1, 2019](#)

[Flood Mitigation Assistance \(FMA\) Notice of Interest](#)

[PDM Notice of Interest](#)

[Local Match Guidance, Sept. 26, 2019](#)

## Kansas City MO



Add Goal

Expand All

Collapse All

### Tornadoes

- ▶ Goal: Increase public awareness and understanding the benefits of "safe rooms."
- ▶ Goal: Ensure public facilities have shelters to accommodate staff and visitors during tornadoes/ nat. hazards.
- ▶ Goal: Encourage building practices and the use of materials that reduce the damaging effects of tornadoes.
- ▶ Goal: Improve Police Department's ability to conduct operations to mitigate loss of life and damage to property.
- ▶ Goal: Increase public awareness on mitigating the damage from tornados
- ▶ Goal: Maintain and improve relationships with meteorologists and media
- ▶ Goal: Improve the capabilities of urban search and rescue teams in collapsed building techniques
- ▶ Goal: Improve and enhance personnel resiliency to damage from tornados
- ▶ Goal: Delete - Duplicate
- ▶ Goal: Enhance Aviation Department's capability to protect from and respond to damage resulting from tornadic activity
- ▶ Goal: Enhance personnel awareness to the personal dangers inherent with tornados and mitigate any damage from the related hazards
- ▶ Goal: Mitigate or prevent the disruption of cyber networks, structures, and conduits as a result of damage from tornados
- ▶ Goal: Mitigate damage and loss of life as a result of tornados to public and recreational areas and facilities
- ▶ Goal: Increase personnel awareness of safety measures and mitigation actions to take in response to tornados
- ▶ Goal: Improve and upgrade Public Works Department's capability to respond to damage caused by tornadoes
- ▶ Goal: Improve safety and mitigate the effects of flooding on police officers so they may continue first responder duties during flooding
- ▶ Goal: Improve the Health Department's ability to mitigate diseases resulting from tornadic activity
- ▶ Goal: Incorporate strategies into KCMO development plans to mitigate damage from tornadic activity
- ▶ Goal: Improve KCMO's ability to mitigate damage from hazardous materials released due to tornadic activity
- ▶ Goal: Improve systems to monitor and track tornados