

SECTION 4- Mitigation Strategy

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

The mitigation strategy was developed through a collaborative group process and consists of general goal statements to guide the jurisdictions in efforts to lessen disaster impacts as well as specific mitigation actions that can be put in place to directly reduce vulnerability to hazards and losses. The following definitions are based upon those found in FEMA publication 386-3, *Developing a Mitigation Plan* (2002):

- **Goals** are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.
- **Objectives** are defined strategies or implementation steps intended to attain the identified goals. Unlike goals, objectives are specific, measurable, and have a defined time horizon.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

4.1 Goals

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

HMPC which includes representatives from both the individual jurisdictions and other entities reviewed the goals and objectives and provided input on what had been accomplished in the last five years. HMPC looked at the goals considering that the goals help in providing direction for reducing hazard-related losses. The other issues taken into account were – do the goals match with the needs of the county and do they help to reduce hazards by the greatest amount. The following goals were reviewed and received consensus by the HMPC as best reflecting the needs of Warren County:

Goal 1: Protect the lives and livelihoods of all citizens.

Goal 2: Employ sustainable principles and practices to enhance mitigation effectiveness.

Goal 3: Ensure continued operation of government and emergency functions during a disaster.

4.2 Identification and Analysis of Mitigation Actions

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

FEMA defines mitigation as “a sustained action taken to reduce or eliminate the long-term risk to people and property from hazards and their effects”. This section of the plan focuses on the mitigation strategies developed by each jurisdiction to reduce risk for both the natural and man-made hazards included in this plan. Each of the mitigation action plans identified in the 2004 plan were reviewed for relevance and updated with progress made for each action plan (Table 4.2). Also, a set of proposed objectives and actions plans were reviewed and discussed for relevance to the updated plan. These were developed prior to the kickoff meeting based on the data limitations within the county with the guidance provided by the State Hazard Mitigation Plan, and through the discussions with the County Emergency management Director and the individual jurisdictions.

The six categories of mitigation shown below are discussed during the meetings.

- To save lives and protect property
- To preserve and protect an area’s environment and economy
- To preserve and maintain an area’s essential services and quality of life.
- To provide information to citizens, businesses, and officials.
- Project implementation and funding.

The meetings further provided with the following list of categories of mitigation actions, which originated from the National Flood Insurance Program’s Community Rating System, as well as definitions and examples for each category:

- Prevention tools can include regulatory methods such as planning and zoning, building regulations, open space planning, land development regulations, and stormwater management.
- Property protection measures reduce the risk of building damage through acquisition of land, relocation of buildings, modifying at-risk structures, and floodproofing at-risk structures.
- Natural resource protection can reduce hazard impacts through measures such as erosion and sediment control or wetlands protection.

- Emergency services measures include warning, response capacity, critical facilities protection, and health and safety maintenance.
- Structural mitigation controls natural hazards through projects such as reservoirs, levees, diversions, channel modifications and storm sewers.
- Public information includes providing hazard maps and information, outreach programs, real estate disclosure, technical assistance and education.

These examples helped the representatives from individual jurisdictions to understand better how the mitigation actions would reduce risks within the county.

All goals and actions from the 2004 plan were carried forward, and new actions were proposed. The table below lists the goals and action plans for this plan update.

Table 4.1

<p>Goal 1: Protect the lives and livelihoods of all citizens</p> <p>Objective 1.1: Provide sufficient warning systems.</p> <ul style="list-style-type: none"> - Identify geographic areas in need of warning systems and develop a plan to implement needed systems. - Improve flood alerting system capabilities.
<p>Objective 1.2: Decrease the occurrence and impact of flooding.</p> <ul style="list-style-type: none"> - Encourage property owners and occupants in hazard areas to participate in mitigation policy formulation. - Target any remaining repetitive flood loss properties for buyout. - Promote environmentally-sound watershed and storm water practices to decrease flash flooding. - Review and revise flood-fighting plans as needed. - Strengthen floodplain regulations as needed. - Improve drainage of roadways in flashflood areas. (proposed) - NFIP- Monitor development in special flood hazard areas to ensure compliance with local flood plain management ordinances.(proposed)
<p>Objective 1.3: Increase knowledge of safety measures among employers and the general public.</p> <ul style="list-style-type: none"> - Develop hazard area maps and promote use by the public. - Consider additional professional development and disaster mitigation training for emergency management personnel. (proposed) - Identify ways to promote FEMA safety tips and mitigation techniques. - To provide earthquake preparedness and safety literature every year in the school districts.
<p>Objective 1.4: Increase and maintain appropriate emergency equipment.</p> <ul style="list-style-type: none"> - Review and upgrade policies to identify and budget additional emergency equipment for health and medical services, mass care agencies, and public information. - Execute and maintain mutual aid agreements with all relevant agencies. - Review and upgrade redundancies for the 911 Center/EOC.
<p>Objective 1.5: Protect residential structures.</p> <ul style="list-style-type: none"> - Decrease wildfire risk in areas where development is adjacent to forests or grasslands by incorporating buffer zones into subdivision regulations. - Promote environmentally-sound, fire-resistant materials for homes.

<ul style="list-style-type: none"> - Identify existing mechanisms to promote NFIP policies and earthquake/seismic insurance.
<p>Objective 1.6: Protect large employment and commercial facilities.</p> <ul style="list-style-type: none"> - Consider known hazards when identifying a site for new facilities and systems. - Encourage tornado safe rooms in new construction. Suggestions include centralized safe rooms in subdivisions and/or safe rooms incorporated into the design of front porch foundations in new homes. - Encourage up-to-date commercial/industrial disaster plans that are coordinated with county/city disaster plans. - Encourage backup systems for commercial and industrial businesses.
<p>Objective 1.7: Identify populations with special needs or those who may be more vulnerable to the impacts of disasters or hazard events. (proposed)</p> <ul style="list-style-type: none"> - Maintain inventory of special needs population, equipment & ADA shelters. - Enhance warning systems and notifications for special populations. - Identify and provide mass care shelters.
<p>Objective 1.8 Reduce the disruption to transportation infrastructure from hazard events, by reducing the vulnerability of transportation infrastructure to hazard events (proposed)</p> <ul style="list-style-type: none"> - Utilize County road right of ways as firebreaks and snow storage. - Maintain inventory of vulnerable infrastructure. - Maintain an inventory of traffic incidents.
<p>Goal 2: Manage growth through sustainable principles and practices</p> <p>Objective 2.1: Reduce and prevent degradation of, or conflicts with, natural resources.</p> <ul style="list-style-type: none"> - Encourage best practices for drought-resistant farming. - Resolve any existing environmental conflicts and take steps to prevent future conflicts. - Work with DNR to identify primary maintenance techniques for earthen dams and encourage their use and support periodic inspections of the dams.
<p>Objective 2.2: Promote sustainable planning, development, and construction practices.</p> <ul style="list-style-type: none"> - Promote building codes in incorporated areas that currently do not have such regulations. - Implement measures to increase the county’s CRS status. - To reduce the effects of flash flooding and drought, promote construction and use practices that facilitate rainwater percolation into local water tables.
<p>Goal 3: Ensure continued operation of government and emergency functions in a disaster</p> <p>Objective 3.1: Strengthen critical structures and infrastructures.</p> <ul style="list-style-type: none"> - Review, prioritize, institute and monitor needed upgrades or retrofits for critical buildings and infrastructures. - Review emergency access routes and evacuation routes and mitigate any problem areas. - Maintain essential public services. (proposed) - Maintain an inventory of levees in the County (proposed)
<p>Objective 3.2: Strengthen collaboration among relevant jurisdictions.</p> <ul style="list-style-type: none"> - Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts and private industry. - Improve planning, funding, and response coordination. (proposed)

Apart from the action plans mentioned above, considering the data limitations encountered during this plan process, the planning committee decided to include some action plans.

Data limitations- action plans
<ul style="list-style-type: none"> - To update the GIS maps and overlay the hazard layers to perform specific hazard analysis. - To include the HAZUS-MH analysis for the hazards. - To include the county assessor as part of the planning committee in the next update cycle. - To include a local engineer as part of the planning committee in the next update cycle to calculate the cost estimates for the hazards. - To work with U.S. Corps of Engineers and the local levee districts on levee mapping and damage estimates. - To work with Regional Homeland Security on the hazard events and damage estimates.

The table below serves as a compilation of meetings with the HMPC and the individual jurisdictions concerning the efficacy and continuation of the 2004 action plans. The 2004 action plans were carried to the updated plan based on the progress made and their need for further inclusion considering the updated hazards and risks.

Table 4.2 Warren County Mitigation Action Assessment

Goals, Objectives & Action Plans	Future inclusion
Goal 1: Protect the lives and livelihoods of all citizens	
1.1 Provide sufficient warning systems	
1. Identify geographic areas in need of warning systems and develop a plan to implement needed systems. <i>Remains in progress with respect to the use of NOAA Weather Radio and Weather Warnings text messaging services.</i>	<i>Action maintained</i>
2. Improve flood alerting system capabilities. <i>Remains in progress with respect to the use of NOAA Weather Radio and Weather Warnings text messaging services.</i>	<i>Action maintained</i>
1.2: Decrease the occurrence and impact of flooding.	
1. Encourage property owners and occupants in hazard areas to participate in mitigation policy formulation. <i>County Emergency Management Director is working with Flood Plain Manager and County Assessor's Office to identify properties that lie in a hazard area. Working to encourage citizens in these areas to attend meeting with zoning changes and long range growth plans for that area.</i>	<i>Action maintained</i>
2. Target any remaining repetitive flood loss properties for buyout. <i>After the flood of 1993 the vast majority of residential structural were bought out by FEMA. The remaining properties in the Missouri River Flood plain are agricultural properties. Remains in progress with respect to the future flood events.</i>	<i>Action maintained</i>
3. Promote environmentally-sound watershed and storm water practices to decrease flash flooding. <i>Remains in progress with respect to the growth made by the jurisdictions. In future,</i>	<i>Action maintained</i>

Goals, Objectives & Action Plans	Future inclusion
<i>there is a need for developing an environmentally-sound watershed plan.</i>	
4. Review and revise flood-fighting plans as needed. <i>Continue to work with local Flood Levee District to develop/implement Levee Emergency Action Plans.</i>	<i>Action maintained</i>
5. Strengthen floodplain regulations as needed. <i>Continue to review and revise existing floodplain regulations to insure they meet all federal, state and local regulations.</i>	<i>Action maintained</i>
1.3 Increase knowledge of safety measures among employers and the general public.	
1. Develop hazard area maps and promote use by the public. <i>County Emergency Management Director encourages the implementation of Arcview mapping software for developing the hazard maps. Also, EMD encourages the implementation of internet access to the public.</i>	<i>Action maintained</i>
3. Identify ways to promote FEMA safety tips and mitigation techniques. <i>Encourage implementing public education programs that address disaster public safety issues. Also, implement public awareness program using newspaper articles, public appearances and the internet.</i>	<i>Action maintained</i>
4. To provide earthquake preparedness and safety literature every year in the school districts. <i>Warren County lies within the New Madrid Earthquake Zone. Warren County has established a Community Emergency Response Team (CERT) and is part of the Missouri Region C – North CERT Coalition. And offers annual CERT training courses to the general public and community groups. Remains in progress.</i>	<i>Action maintained</i>
1.4 Increase and maintain appropriate emergency equipment	
1. Review and upgrade policies to identify and budget additional emergency equipment for health and medical services, mass care agencies, and public information. <i>Warren County reviews its County Emergency Plan on a regular basis. The county also conducts tabletop exercises and functional exercises to identify weakness in the response plans as well as identifying equipment gaps. Remains in progress.</i>	<i>Action maintained</i>
2. Execute and maintain mutual aid agreements with all relevant agencies. <i>Warren County has signed Mutual Aid Agreements with all boundaries counties and all municipalities within the county. Remains in progress.</i>	<i>Action maintained</i>
3. Review and upgrade redundancies for the 911 Center/EOC. <i>911 calls are handled by the Warren County Joint 911 Dispatch Center. This agency by Missouri State Statutes is its only political subdivision and is not affiliated with the County of Warren. Warren County is responsible for the operation of the County's EOC and is currently developing plans for the construction of the new EOC. This projected is slated for completion in late 2011 or early 2012.</i>	<i>Action maintained</i>
1.5 Protect residential structures	
1. Decrease wildfire risk in areas where development is adjacent to forests or grasslands by incorporating buffer zones into subdivision regulations. <i>While approximately 73% of Warren County is forested, Warren County has had no significant wildfires. In order to continue this positive trend the County intends to continue to educate the public as to the dangers of wildfires along with promoting buffer zones between forest and grasslands.</i>	<i>Action maintained</i>
2. Promote environmentally-sound, fire-resistant materials for homes. <i>Adopt local Building codes that require fire safety, seismic safety building techniques. Developers should be encouraged to promote and implement sound building safety practices.</i>	<i>Action maintained</i>

Goals, Objectives & Action Plans	Future inclusion
<p>3. Identify existing mechanisms to promote NFIP policies and earthquake/seismic insurance. <i>Identify properties that lie in a flood zone and develop community education program for the general public, lending institutions real estate agents and insurance agents.</i></p>	Action maintained
1.6 Protect large employment and commercial facilities.	
<p>1. Consider known hazards when identifying a site for new facilities and systems. <i>Educate governmental approval authorities i.e. Planning & Zoning Commissions/boards and elected officials in identifying local hazards associated with particular parcels prior to issuing permits.</i></p>	Action maintained
<p>2. Encourage tornado safe rooms in new construction. Encourage up-to-date commercial/industrial disaster plans that are coordinated with county/city disaster plans. <i>Identify existing structures and or population bases that would benefit by the construction of a tornado safe room(s). Implement building code requires for safe rooms for future construction. Work with local schools districts, trailer parks, and large businesses in developing disaster plans.</i></p>	Action maintained
<p>3. Encourage backup systems for commercial and industrial businesses. <i>Educate local businesses to develop and maintain emergency disaster plans and business continuity plans.</i></p>	Action maintained
Goal 2: Manage growth through sustainable principles and practices.	
2.1: Reduce and prevent degradation of, or conflicts with, natural resources.	
<p>1. Encourage best practices for drought-resistant farming. <i>Working with the Missouri Department of Agriculture, local farm bureaus, University of Missouri to promote best agricultural practices.</i></p>	Action maintained
<p>2. Resolve any existing environmental conflicts and take steps to prevent future conflicts. <i>Identify potential environmental conflicts and implement regulations to address these issues.</i></p>	Action maintained
<p>3. Work with DNR to identify primary maintenance techniques for earthen dams and encourage their use and support periodic inspections of the dams. <i>Warren County has 32 regulated Dams in the county. In 2009 Warren was the pilot county for DNR for the development of Emergency Action Plans (EAP). Under a federal grant DNR has developed Inundation maps for all 32 dams in Warren County. Warren County EMA has over laid the inundation maps on to the county's parcel data to identify the residential parcels downstream from each dam.</i></p>	Action maintained
2.2 Promote sustainable planning, development, and construction practices.	
<p>1. Promote building codes in incorporated areas that currently do not have such regulations. <i>While Warren County does have Planning & Zoning Regulations in place the adoption and enforcement of building codes are left up to the local fire districts/fire departments.</i></p>	Action maintained
<p>2. Implement measures to increase the county's CRS status. <i>Review existing county regulatory orders and modify as needed.</i></p>	Action maintained
<p>3. To reduce the effects of flash flooding and drought, promote construction and use practices that facilitate rainwater percolation into local water tables. <i>As growth continues in Warren county the County Commissioners will need to look at ways of addressing flashing flooding issues caused by the lack of sufficient percolation on parcels being developed.</i></p>	Action maintained
Goal: 3 Ensure continued operation of government and emergency functions in a disaster.	

Goals, Objectives & Action Plans	Future inclusion
3.1: Strengthen critical structures and infrastructures.	
1. Review, prioritize, institute and monitor needed upgrades or retrofits for critical buildings and infrastructures. <i>Conduct building hazard analysis on all public critical structures and infrastructures. Identify critical areas that need to be addresses and prioritize these items. Develop long range plan to funds these projects.</i>	<i>Action maintained</i>
2. Review emergency access routes and evacuation routes and mitigate any problem areas. <i>Utilize the county's existing Hazard Analysis along with the 2009 All Hazard Mitigation Plan to identify access routes and evacuation routes.</i>	<i>Action maintained</i>
3.2 Strengthen collaboration among relevant jurisdictions.	
1. Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts and private industry. <i>Warren County has a good working relationship among the jurisdictions within the county.</i>	<i>Action maintained</i>

4.3 Implementation of Mitigation Actions

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

The overall prioritization of the mitigation actions has been accomplished by utilizing the STAPLEE prioritizations, Cost-Benefit Scores and the jurisdictional prioritizations. Each community is different in terms of its economics, size, geography, governance, demography, land uses, and hazards. Therefore each community's prioritization of action plans will vary to some degree. In order to effectively prioritize actions in relation to jurisdiction specific features STAPLEE scores, Cost-Benefit Review scores, and jurisdictional priorities were carefully examined by the committee.

STAPLEE process

STAPLEE scores were determined by the planning committee with assistance from the plan drafter. A STAPLEE review chart is included in the table 4.3. Individual STAPLEE scores are included with each action found in the following section.

Definitions of the STAPLEE criteria are included below along with a definition of the scoring criteria.

STAPLEE:

- Social- “Is the action plan socially acceptable”
- Technical- “Is the action plan technically feasible & potentially successful”
- Administrative- “Is the action plan administratively workable”
- Political- “Is the action plan politically acceptable”
- Legal- “Is there legal authority to implement the action plan”
- Economic- “Is the action plan economically beneficial”
- Environmental- “Is the action plan environmentally beneficial”

STAPLEE score:

- High STAPLEE Priority:** action plan which meets five of the seven STAPLEE criteria
- Medium STAPLEE Priority:** action plan which meets four of the seven STAPLEE criteria
- Low STAPLEE Priority:** action plan which meets three of the seven criteria

Table 4.3 shows the STAPLEE scores for individual action plans

Proposed Action (abbreviated for readability)	S	T	A	P	L	E	E	STAPLEE priority
1.1.1 Identify geographic areas in need of warning systems	X			X	X	X		Medium
1.1.2 Improve flood alerting system capabilities	X			X	X	X		Medium
1.2.1 Public mitigation policy formulation.	X			X		X		Low
1.2.2 Target any remaining repetitive flood loss properties for buyout.	X			X	X			Low
1.2.3 Environmentally-sound watershed and stormwater practices.	X	X		X		X	X	Medium
1.2.4 Review and revise flood-fighting plans as needed.	X	X	X		X			Medium
1.2.5 Strengthen floodplain regulations.	X	X		X	X			Medium
1.2.6 Improve drainage of roadways in flashflood areas	X			X	X			Medium
1.2.7 NFIP- Monitor development in special flood hazard areas				X	X	X		Low
1.3.1 Promote the use of hazard area maps by the public.	X			X			X	Medium
1.3.2 Additional professional training for emergency management personnel.	X	X	X	X	X	X		High
1.3.3 FEMA safety tips and mitigation techniques	X			X		X		Low
1.3.4 Provide earthquake preparedness and safety literature in schools	X	X	X	X	X	X		High
1.4.1 Review and upgrade policies for additional emergency equipment.		X	X		X			Low
1.4.2 Mutual aid agreements with all relevant agencies.	X	X	X	X	X	X		High
1.4.3 Redundancy measures for the 911 Center/EOC.	X	X	X	X	X	X		High
1.5.1 Decrease wildfire risk in buffer zones.	X			X		X		Low
1.5.2 Environmentally-sound, fire-resistant home materials.	X			X	X		X	Medium
1.5.3 Promote NFIP policies and earthquake insurance.	X	X		X				Low
1.6.1 Consideration of known hazards for identification of new facilities	X	X		X	X	X		High
1.6.2 Commercial/industrial disaster plans coordinate with community.	X			X	X	X		Medium
1.6.3 Backup systems for commercial/industrial businesses.	X			X	X			Low

Proposed Action (abbreviated for readability)	S	T	A	P	L	E	E	STAPLEE priority
1.7.1 Maintain inventory of special needs population, equipment & ADA shelters.	X		X	X	X	X		High
1.7.2 Enhance warning systems	X	X	X	X	X	X		High
1.7.3 Identify & provide mass care shelters.	X		X	X	X	X		High
1.8.1 County road right of way as firebreaks and snow storage	X				X	X		Low
1.8.2 Inventory of vulnerable infrastructure	X		X	X	X			Medium
1.8.3 Inventory of traffic accidents	X				X	X		Low
2.1.1. Encourage best practices for drought-resistant farming.	X				X	X		Low
2.1.2 Resolve environmental conflicts; prevent future conflicts.	X			X	X	X		Medium
2.1.3 Identification of primary maintenance techniques for earthen dams			X	X	X			Low
2.2.1 Promote building codes in incorporated areas			X	X	X			Low
2.2.2 Increase the county's CRS status.			X	X	X			Low
2.2.3 Facilitate rainwater percolation into local water tables.	X		X	X				Medium
3.1.1 Upgrades or retrofits for critical buildings and infrastructures.			X	X	X	X		Medium
3.1.2 Inspect emergency access routes and mitigate any problem areas	X			X	X	X		Medium
3.1.3 Maintain essential public services	X		X	X	X	X	X	High
3.1.4 Maintain inventory of levees in the county	X			X	X	X		Medium
3.2.1 Identify collaboration among agencies	X	X	X	X	X	X		High
3.2.2 Improve planning, funding, and response coordination	X		X	X	X	X		High

Data limitations- action plans	S	T	A	P	L	E	E	STAPLEE priority
To update the GIS maps and overlay the hazard layers to perform specific hazard analysis.	X	X	X	X	X		X	High
To include the HAZUS-MH analysis for the hazards.	X	X	X	X	X		X	High
To include the county assessor as part of the planning committee in the next update cycle.		X		X	X		X	Medium
To include a local engineer as part of the planning committee in the next update cycle to calculate the cost estimates for the hazards.		X		X	X		X	Medium
To work with U.S. Corps of Engineers on levee mapping and damage estimates.		X	X	X	X	X	X	High
To work with Regional Homeland Security on the hazard events and damage estimates.		X	X	X	X	X	X	High

Cost-Benefit Review

Cost-Benefit Review was completed by the planning committee with assistance from the plan drafter. Specific monetary cost and benefit information was not available for evaluation, but an action item has been included in Section 5 of the plan to address this data deficiency during the next plan update.

However, in order to prioritize the action plans, individual jurisdictions considered the cost estimates based on the past experiences and typical projects. Also, jurisdictional budgetary constraints and the knowledge of the jurisdictions were utilized to arrive with the cost-benefit scores.

A more limited method of cost-benefit review was used to determine comparative levels concerning costs and benefits for each action plan. Cost benefit review tables and scales are defined below.

Cost-benefit (C/B) scores

High benefit- Benefit 100 lives or 10 Structures

Medium benefit- Benefit 50 lives or 5 Structures

Low benefit- Benefit less than 10 lives or 1 Structure

High cost- Project would require an increase in revenue through an alternative source (bonds and grants) to implement.

Medium cost- Project could be implemented with the existing funding but would require a budget amendment.

Low cost- Project could be funded under the existing budget.

Overall cost-benefit scores

The cost to cover implementation of a specific action plan was compared with the benefit that each action plan has on the specific jurisdiction. Action plans that have a cost level equal or lesser than the benefit level were viewed as cost-beneficial actions, thereby receiving a high priority. The approach followed for assigning the overall cost-benefit scores is described in detail below.

- The action plans that incur low costs with higher effect on reducing the losses to life and property were assigned high priority.
- The action plans that incur medium costs with medium effect on reducing the losses to life and property were assigned medium priority.
- The action plans that incur higher costs with those that are difficult to assess the benefits and those hazards that didn't have any noted major occurrences in the jurisdictions were assigned low priority.

For example, the cost incurred in constructing a tornado safe room (Action plan 1.6.2) is high. The benefits of building it are also high due to the reduced effect on losses to life. Taking this cost-benefit review into account along with the anticipated positive effects and the cost incurred on the communities, this action plan received a medium priority.

Table 4.4 Overall cost-benefit scores

Benefits	Costs	Priority
High	High	Medium
High	Medium	Medium
High	Low	High
Medium	High	Low
Medium	Medium	Medium
Medium	Low	High
Low	Low	High
Low	High	Low
Low	Medium	Low

Table 4.5 Cost-Benefit score and priority ranking for the action plans

Proposed Action (abbreviated for readability)	Benefit	Cost	Priority
1.1.1 Identify geographic areas in need of warning systems	Low	Medium	Low
1.1.2 Improve flood alerting system capabilities	Low	High	Low
1.2.1 Public mitigation policy formulation.	Low	Medium	Low
1.2.2 Target any remaining repetitive flood loss properties for buyout.	Low	Medium	Low
1.2.3 Environmentally-sound watershed and stormwater practices.	Medium	Medium	Medium
1.2.4 Review and revise flood-fighting plans as needed.	High	Medium	Medium
1.2.5 Strengthen floodplain regulations.	Low	Medium	Low
1.2.6 Improve drainage of roadways in flashflood areas	Medium	Medium	Medium
1.2.7 NFIP- Monitor development in special flood hazard areas	Low	Medium	Low
1.3.1 Promote the use of hazard area maps by the public.	High	Medium	Medium
1.3.2 Additional professional training for emergency management personnel.	Medium	Medium	Medium
1.3.3 FEMA safety tips and mitigation techniques	Low	Medium	Low
1.3.4 Provide earthquake preparedness and safety literature in schools	Medium	Low	High
1.4.1 Review and upgrade policies for additional emergency equipment.	Low	Medium	Low
1.4.2 Mutual aid agreements with all relevant agencies.	Medium	Medium	Medium
1.4.3 Redundancy measures for the 911 Center/EOC.	Low	Medium	Low

Proposed Action (abbreviated for readability)	Benefit	Cost	Priority
1.5.1 Decrease wildfire risk in buffer zones.	Low	Medium	Low
1.5.2 Environmentally-sound, fire-resistant home materials.	Low	Medium	Low
1.5.3 Promote NFIP policies and earthquake insurance.	Low	Medium	Low
1.6.1 Consideration of known hazards for identification of new facilities	Low	Medium	Low
1.6.2 Commercial/industrial disaster plans coordinate with community.	High	High	Medium
1.6.3 Backup systems for commercial/industrial businesses.	Low	Medium	Low
1.7.1 Maintain inventory of special needs population, equipment & ADA shelters.	High	Medium	Medium
1.7.2 Enhance warning systems	Medium	Medium	Medium
1.7.3 Identify & provide mass care shelters.	Medium	Medium	Medium
1.8.1 County road right of way as firebreaks and snow storage	Low	Medium	Low
1.8.2 Inventory of vulnerable infrastructure	Medium	Medium	Medium
1.8.3 Inventory of traffic accidents	Low	Medium	Low
2.1.1. Encourage best practices for drought-resistant farming.	Low	Medium	Low
2.1.2 Resolve environmental conflicts; prevent future conflicts.	Low	High	Low
2.1.3 Identification of primary maintenance techniques for earthen dams	High	Medium	Medium
2.2.1 Promote building codes in incorporated areas	Medium	Medium	Medium
2.2.2 Increase the county's CRS status.	Low	Medium	Low
2.2.3 Facilitate rainwater percolation into local water tables.	Low	Medium	Low
3.1.1 Upgrades or retrofits for critical buildings and infrastructures.	Medium	Medium	Medium
3.1.2 Inspect emergency access routes and mitigate any problem areas	High	Medium	Medium
3.1.3 Maintain essential public services	High	High	Medium
3.1.4 Maintain inventory of levees in the county	Medium	Medium	Medium
3.2.1 Identify collaboration among agencies	High	Low	High
3.2.2 Improve planning, funding, and response coordination	High	Low	High

Data limitations- action plans	Benefit	Cost	Priority
To update the GIS maps and overlay the hazard layers to perform specific hazard analysis.	High	Medium	Medium
To include the HAZUS-MH analysis for the hazards.	High	Medium	Medium
To include the county assessor as part of the planning committee in the next update cycle.	High	Low	High
To include a local engineer as part of the planning committee in the next update cycle to calculate the cost estimates for the hazards.	High	Medium	Medium
To work with U.S. Corps of Engineers on levee mapping and damage estimates.	High	Low	High
To work with Regional Homeland Security on the hazard events and damage estimates.	High	Low	High

Jurisdictional prioritizations

The factors considered for the jurisdictional prioritizations include the hazard priority rankings, when and where the damage occurs, available funding, local capabilities, local needs, and jurisdictional priorities. Along with these criteria, local experiences and perceptions for each hazard were also considered. The individual jurisdictional prioritizations are shown in the Appendix Section.

These jurisdictional prioritizations were given rating scores which were utilized in developing the overall prioritizations. The rating scores described below were defined by the committee with the help of the plan drafter.

- If a jurisdiction rated a particular action plan as a *low*, it was given a score of '1'.
- If a jurisdiction rated a particular action plan as a *medium*, it was given a score of '2'.
- If a jurisdiction rated a particular action plan as a *high*, it was given a score of '3'.

Table 4.6 shows the total scores for the jurisdictional prioritizations

Proposed Action (abbreviated for readability)	Total score
1.1.1 Identify geographic areas in need of warning systems	16
1.1.2 Improve flood alerting system capabilities	14
1.2.1 Public mitigation policy formulation.	14
1.2.2 Target any remaining repetitive flood loss properties for buyout.	13
1.2.3 Environmentally-sound watershed and stormwater practices.	22
1.2.4 Review and revise flood-fighting plans as needed.	18
1.2.5 Strengthen floodplain regulations.	17
1.2.6 Improve drainage of roadways in flashflood areas	19
1.2.7 NFIP- Monitor development in special flood hazard areas	17
1.3.1 Promote the use of hazard area maps by the public.	20
1.3.2 Additional professional training for emergency management personnel.	25
1.3.3 FEMA safety tips and mitigation techniques	16
1.3.4 Provide earthquake preparedness and safety literature in schools	24
1.4.1 Review and upgrade policies for additional emergency equipment.	17
1.4.2 Mutual aid agreements with all relevant agencies.	32
1.4.3 Redundancy measures for the 911 Center/EOC.	23
1.5.1 Decrease wildfire risk in buffer zones.	13
1.5.2 Environmentally-sound, fire-resistant home materials.	13
1.5.3 Promote NFIP policies and earthquake insurance.	14
1.6.1 Consideration of known hazards for identification of new facilities	23
1.6.2 Commercial/industrial disaster plans coordinate with community.	19
1.6.3 Backup systems for commercial/industrial businesses.	14

Proposed Action (abbreviated for readability)	Total score
1.7.1 Maintain inventory of special needs population, equipment & ADA shelters.	26
1.7.2 Enhance warning systems	24
1.7.3 Identify & provide mass care shelters.	24
1.8.1 County road right of way as firebreaks and snow storage	11
1.8.2 Inventory of vulnerable infrastructure	21
1.8.3 Inventory of traffic accidents	17
2.1.1. Encourage best practices for drought-resistant farming.	11
2.1.2 Resolve environmental conflicts; prevent future conflicts.	15
2.1.3 Identification of primary maintenance techniques for earthen dams	18
2.2.1 Promote building codes in incorporated areas	18
2.2.2 Increase the county's CRS status.	16
2.2.3 Facilitate rainwater percolation into local water tables.	15
3.1.1 Upgrades or retrofits for critical buildings and infrastructures.	21
3.1.2 Inspect emergency access routes and mitigate any problem areas	22
3.1.3 Maintain essential public services	31
3.1.4 Maintain inventory of levees in the county	19
3.2.1 Identify collaboration among agencies	28
3.2.2 Improve planning, funding, and response coordination	24

The action plans for the data limitations are prioritized by the planning committee not by the jurisdictions. The planning committee considered the hazard priority and their experiences & capabilities to give a score to the action plans.

Data limitations- action plans	Hazard priority and Score
To update the GIS maps and overlay the hazard layers to perform specific hazard analysis.	Planning committee prioritized as high= '3'
To include the HAZUS-MH analysis for the hazards.	Planning committee prioritized as high= '3'
To include the county assessor as part of the planning committee in the next update cycle.	Planning committee prioritized as medium= '2'
To include a local engineer as part of the planning committee in the next update cycle to calculate the cost estimates for the hazards.	Planning committee prioritized as medium= '2'
To work with U.S. Corps of Engineers on levee mapping and damage estimates.	Hazard priority- High Planning committee prioritized as high= '3'
To work with Regional Homeland Security on the hazard events and damage estimates.	Planning committee prioritized as high= '3'

Overall prioritization

Overall prioritization was calculated by summing the values of STAPLEE score, Cost-Benefit scores and the jurisdictional prioritization scores.

STAPLEE score: The overall STAPLEE scores considered are:

- **5-** High STAPLEE Priority: action plan which meets five of the seven STAPLEE criteria
- **4-** Medium STAPLEE Priority: action plan which meets four of the seven STAPLEE criteria
- **3-** Low STAPLEE Priority: action plan which meets three of the seven criteria

Cost-benefit score: The overall cost-benefit scores considered are:

- Low- 1
- Medium-3
- High-5

After summing all the values of STAPLEE, Cost-Benefit, and jurisdictional prioritization scores, the associated timelines were factored into the overall prioritization process which is defined below.

High Priority: an action plan that could be initiated, if possible, within the next 2 or 3 years

Medium Priority: an action plan that could be initiated within the next 5 years

Low Priority: an action plan that will not be addressed immediately

Final prioritizations: The total scores along with the associated timelines were considered to derive with these scores.

- Total score between 15-23 and any action plan that will not be addressed immediately received a **“low”** priority
- Total score between 24-31 and any action plan that could be initiated within the next 5 years received a **“medium”** priority
- Total score between 32-38 and any action plan that could be initiated, if possible within the next 2 or 3 years received a **“high”** priority

Table 4.7 below shows the compilation of STAPLEE, Cost-Benefit, and overall scores along with the final prioritizations.

Table 4.7

Proposed Action (abbreviated for readability)	STAPLEE score	Cost-benefit score	Jurisdictional prioritization score	Overall score	Priority
1.1.1 Identify geographic areas in need of warning systems	4	1	16	21	Low
1.1.2 Improve flood alerting system capabilities	4	1	14	19	Low
1.2.1 Public mitigation policy formulation.	3	1	14	18	Low
1.2.2 Target any remaining repetitive flood loss properties for buyout.	3	1	13	17	Low
1.2.3 Environmentally-sound watershed and stormwater practices.	4	3	22	29	Medium
1.2.4 Review and revise flood-fighting plans as needed.	4	3	18	25	Medium
1.2.5 Strengthen floodplain regulations.	4	1	17	22	Low
1.2.6 Improve drainage of roadways in flashflood areas	4	3	19	26	Medium
1.2.7 NFIP- Monitor development in special flood hazard areas	3	1	17	21	Low
1.3.1 Promote the use of hazard area maps by the public.	3	3	20	26	Medium
1.3.2 Additional professional training for emergency management personnel.	5	3	25	33	High
1.3.3 FEMA safety tips and mitigation techniques	3	1	16	20	Low
1.3.4 Provide earthquake preparedness and safety literature in schools	5	5	24	34	High
1.4.1 Review and upgrade policies for additional emergency equipment.	3	1	17	21	Low
1.4.2 Mutual aid agreements with all relevant agencies.	5	3	32	40	High
1.4.3 Redundancy measures for the 911 Center/EOC.	5	1	23	29	Medium
1.5.1 Decrease wildfire risk in buffer zones.	3	1	13	17	Low
1.5.2 Environmentally-sound, fire-resistant home materials.	4	1	13	18	Low
1.5.3 Promote NFIP policies and earthquake insurance.	3	1	14	18	Low
1.6.1 Consideration of known hazards for identification of new facilities	5	1	23	29	Medium
1.6.2 Commercial/industrial disaster plans coordinate with community.	4	3	19	26	Medium
1.6.3 Backup systems for commercial/industrial businesses.	3	1	14	18	Low
1.7.1 Maintain inventory of special needs population, equipment & ADA shelters.	5	3	26	34	High
1.7.2 Enhance warning systems	6	3	24	33	High
1.7.3 Identify & provide mass care shelters.	5	3	24	32	High
1.8.1 County road right of way as firebreaks and snow storage	3	1	11	15	Low
1.8.2 Inventory of vulnerable infrastructure	4	3	21	29	Medium
1.8.3 Inventory of traffic accidents	3	1	17	21	Low
2.1.1. Encourage best practices for drought-resistant farming.	3	1	11	15	Low
2.1.2 Resolve environmental conflicts; prevent future	4	1	15	19	Low

Proposed Action (abbreviated for readability)	STAPLEE score	Cost-benefit score	Jurisdictional prioritization score	Overall score	Priority
conflicts.					
2.1.3 Identification of primary maintenance techniques for earthen dams	3	3	18	24	Medium
2.2.1 Promote building codes in incorporated areas	3	3	18	24	Medium
2.2.2 Increase the county's CRS status.	3	1	16	20	Low
2.2.3 Facilitate rainwater percolation into local water tables.	4	1	15	20	Low
3.1.1 Upgrades or retrofits for critical buildings and infrastructures.	4	3	21	28	Medium
3.1.2 Inspect emergency access routes and mitigate any problem areas	4	3	22	29	Medium
3.1.3 Maintain essential public services	5	3	31	39	High
3.1.4 Maintain inventory of levees in the county	4	3	19	26	Medium
3.2.1 Identify collaboration among agencies	5	5	28	38	High
3.2.2 Improve planning, funding, and response coordination	5	5	24	34	High

The action plans proposed for the data limitations are prioritized differently by the planning committee than the jurisdictional action plans. The STAPLEE score, cost-benefit score and the prioritization score are considered for the overall priority.

Action plans with overall score of 11-13 received a 'high' priority

Action plans with overall score of 8-10 received a 'medium' priority

Action plans with overall score below 8 received a 'low' priority

Data limitations- action plans	STAPLEE score	Cost-benefit score	Prioritization score	Overall score	Priority
To integrate the dam inundation maps when they are available.	5	5	3	13	High
To update the GIS maps and overlay the hazard layers to perform specific hazard analysis.	5	3	3	11	High
To include the HAZUS-MH analysis for the hazards.	5	3	3	11	High
To include the county assessor as part of the planning committee in the next update cycle.	4	5	2	11	High
To include a local engineer as part of the planning committee in the next update cycle to calculate the cost estimates for the hazards.	4	3	2	9	Medium
To work with U.S. Corps of Engineers on levee mapping and damage estimates.	5	5	3	13	High
To work with Regional Homeland Security on	5	5	3	13	High

Data limitations- action plans	STAPLEE score	Cost-benefit score	Prioritization score	Overall score	Priority
the hazard events and damage estimates.					

The table below shows the five-year action plan matrix for Warren County and all the participating jurisdictions. The individual jurisdictional prioritizations are attached in the Appendix Section.

The matrix includes the following information:

- Number of the action plan
- Status of the action plan: Ongoing, Revised, or New
- Priority: High, Medium or a Low.
- Hazards addressed: specifies the hazards addressed by each action plan.
- Mitigation Category: Prevention tool, Property protection, Natural resource protection, Emergency services, Structural mitigation control, and Public information.
- Responsible agency: The agency responsible for gathering resources, and/or to oversee project implementation, monitoring, and evaluation.
- Funding source: This includes internal funds generated directly from local governmental funding sources (taxes, bonds, budget lines, etc...), Governmental Program Funds which are funds granted to the local entity from State and/or Federal funding sources and Private funding which comes from grants through charitable foundations, regular bank loans, or donations secured by the local entity for the purposes of the mitigation process.
- Incorporation into existing plans: this lists the names of the existing plans or mechanisms that the action plan could be incorporated into.
- Method of evaluation: Describes how the implementation of the action plan will be evaluated.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
1.1.1	Ongoing	Low	All hazards	Prevention tool	County EMA, Fire & ambulance district, Mayors, Police chief	Local funds, Government programs & private funding	Warning coverage maps, County Emergency Operations Plan	Remains in progress with respect to the use of NOAA Weather Radio and Weather Warnings text messaging services.
1.1.2	Ongoing	Low	Floods	Prevention tool	County EMA, Building commissioner, Mayors, Regional Planning Commission, School Superintendent, School District Facilities Operations Director	Local funds, Government programs & private funding	Flooding reports, County Emergency Operations Plan	Remains in progress with respect to the use of NOAA Weather Radio and Weather Warnings text messaging services.
1.2.1	Ongoing	Low	All hazards	Prevention tool, Public information	County EMA, Police chief, Mayors, School superintendent	Local funds, Government programs & private funding, Internal funding	Emergency management public education efforts, County Emergency Operations Plan	County EMD is working with Flood Plain Manager and County Assessor's Office to identify properties that lie in a hazard area. Working to encourage citizens in these areas to attend meetings related to zoning changes and long range growth plans for that area.
1.2.2	Ongoing	Low	Floods/levee failure	Property protection	County EMA, Building commissioner, Mayors, Regional planning commission, School superintendent	Federal buyout programs, Local funds, Government programs	Flooding reports, County Emergency Operations Plan	After the flood of 1993 the vast majority of residential structural were bought out by FEMA. The remaining properties in the Missouri River Flood plain are agricultural properties. Remains in progress with respect to the future flood events.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
1.2.3	Ongoing	Medium	Floods/levee failure	Prevention tool, Natural resource protection	Building commissioner, Mayors, Board of Alderman, School superintendent & Director of maintenance, School District Facilities Operations Director	Federal grants, local funds, private developer funding, Government programs	County Emergency Operations Plan, public education mechanisms	As the municipalities and county continues to grow, a sound environmentally watershed plan needs to be developed.
1.2.4	Ongoing	Medium	Floods/levee failure	Property protection	County EMA, Building commissioner, Mayor & city clerk, Board of Alderman, School superintendent, School District Facilities Operations Director	Federal grants, local funds, government programs	County Emergency Operations Plan	Continue to work with local Flood Levee Districts to develop/implement Levee Emergency Action Plans.
1.2.5	Ongoing	Low	Floods	Property protection	County EMA, Building commissioner, Mayors, Board of Alderman, School superintendent, School District Facilities Operations Director	Federal grants, local funds, government programs	Floodplain ordinance, County Emergency Operations Plan	Continue to review and revise existing floodplain regulations to insure they meet all federal, state and local regulations.
1.2.6	New	Medium	Floods	Natural resource protection	County EMA, Building commissioner, Mayors, Board of Alderman, School superintendent, School District Facilities Operations Director	Federal funding, developer funds, local funds, government programs	County Emergency Operations Plan	Continue to identify roadways that flood during heavy rain events and prioritize location based on severity, frequency, traffic volume. Improve drainage by elevating roadways and replace existing low water crossing as funds become available.
1.2.7	New	Low	Floods	Natural resource protection	County EMA, Building commissioner, Mayors, Board of Alderman, School	Local funds & government programs	Flood plain ordinance, County	Identify special flood hazard areas and develop criteria for development

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
					superintendent, School District Facilities Operations Director		Emergency Operations Plan	within these zones.
1.3.1	Ongoing	Medium	All hazards	Public information	County EMA, Building commissioner, City Administrator, Fire & ambulance district, Regional planning commission, School superintendent, School District Facilities Operations Director	Local funds, government programs & private funding, County emergency funding	Warning coverage maps, public education mechanisms, Hazard mitigation plan, County Emergency Operations Plan	Warren County now has the capability to identify local hazards on the county's ArcView Mapping Software. Working to implement internet access to the public.
1.3.2	New	High	All hazards	Public information	County EMA, Police chief, Building commissioner, Fire chief, School superintendent, School board, School District Facilities Operations Director	Local funds, government programs & private funding, FEMA/SEMA training funds, existing training funding via fire department	Emergency management additional training mechanisms	The State Emergency Management Agency (SEMA) offers class room and online training dealing with mitigation, preparedness and response training courses.
1.3.3	Ongoing	Low	All hazards	Emergency services measure , Public information	County EMA, Building commissioner, Jurisdictions, School superintendent	Local funds & government programs, public funding	Emergency management additional training mechanisms.	Implement public education program that addresses disaster public safety. Implement public awareness program using newspaper articles, public appearances and the internet
1.3.4	Ongoing	High	Earthquake	Public information	County EMA, Police chief, City Administrator, Fire & ambulance district,	Homeland security grant funding supplemented by	Emergency management additional	Warren County lies within the New Madrid Earthquake Zone. Warren

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
					Jurisdictions, School superintendent, Director of Special Services for School Districts, School Administrator	local funds, ERIP (free state-sponsored planning tool), Local funds & government programs, School District budget	training mechanisms, County Emergency Operations Plan	County has established a Community Emergency Response Team (CERT) and is part of the Missouri Region C – North CERT Coalition. And offers annual CERT training courses to the general public and community groups.
1.4.1	Ongoing	Low	All hazards	Emergency services measure	County EMA, County health department, City Administrator, Police chief, School superintendent	Federal homeland security funding & government programs, other grants such as Assistance to Firefighter grants (AFG), and Local emergency planning committee (LEPC)	County Emergency Operations Plan	Warren County reviews its County Emergency Plan on a regulator basis. The county also conducts tabletop exercises and functional exercises to identify weakness in the response plans as well as identifying equipment gaps.
1.4.2	Ongoing	High	All hazards	Public information	County government, first response agencies, City Administrator, County EMA, School superintendent, School District Facilities Operations Director	Local funds & government programs	County Emergency Operations Plan	Warren County has signed Mutual Aid Agreements with all boundaries counties and all municipalities within the county.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
1.4.3	Ongoing	Medium	All hazards	Emergency services measure	County emergency services, City Administrator, County EMA, Fire chief, Ambulance district, School superintendent	Federal EMPG, local funds & government programs, Homeland security grant funding	County Emergency Operations Plan	911 calls are handled by the Warren County Joint 911 Dispatch Center. This agency by Missouri State Statutes is its only political subdivision and is not affiliated with the County of Warren. Warren County is responsible for the operation of the County's EOC and is currently developing plans for the construction of the new EOC. This projected is slated for completion in late 2011 or early 2012.
1.5.1	Ongoing	Low	Wildfire	Natural resource protection	Planning & Zoning Commission, City Administrator, Fire chief, School superintendent	Local funds, private developer funds & government programs	Planning and zoning regulations	While approximately 73% of Warren County is forested, Warren County has had no significant wildfires. In order to continue this positive trend the county intends to continue to educate the public as to the dangers of wildfires along with promoting buffer zones between forest and grasslands.
1.5.2	Ongoing	Low	Wildfire	Natural resource	County, Building Commissioner, City	Local funds, private funds &	Local building codes, Planning	Adopt local Building codes that require fire safety,

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
				protection	Administrator & building code committee, Mayor, Board of Alderman, School superintendent	government programs	and zoning regulations	seismic safety building techniques. Developers should be encouraged to promote and implement sound building safety practices.
1.5.3	Ongoing	Low	Earthquake	Natural resource protection	County, Building Commissioner, City Administrator, Fire & ambulance district, Mayor, Board of Alderman, School superintendent	Local funds, private funds & government programs	Public awareness events	Identify properties that lie in a flood zone and develop community education program for the general public, lending institutions real estate agents and insurance agents.
1.6.1	Ongoing	Medium	All hazards	Prevention tool	County, Building Commissioner, City Administrator, Planning & Zoning Commission, Mayor, Board of Alderman, School superintendent, School District Facilities Operations Director, School Board	Local funds, private funds & government programs	Planning and zoning regulations	Educate governmental approval authorities i.e. Planning & Zoning Commissions/boards and elected officials in identifying local hazards associated with particular parcels prior to issuing permits.
1.6.2	Ongoing	Medium	All hazards	Emergency services measure	County EMA, Building Commissioner, Local businesses, School superintendent, School District Director of Maintenance	Federal mitigation grants, Local funds, private funds & government programs	County Emergency Operations Plan, Disaster Recovery Plan	Identify existing structures and or population bases that would benefit by the construction of a tornado safe room(s). Implement building code requires for safe rooms for future construction. Work with local schools districts, trailer parks and large

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
								business in developing disaster plans.
1.6.3	Ongoing	Low	All hazards	Property protection	Local businesses, County EMA, School superintendent	Federal mitigation grants, Local funds, private funds & government programs	County Emergency Operations Plan, Disaster Recovery Plan.	Educate local businesses to develop and maintain emergency disaster plans and business continuity plans.
1.7.1	New	High	All hazards	Emergency services measure	Warren County health department, County EMA, Police chief, Fire chief, City administrator, Mayor, School superintendent, School District Facilities Operations Director	Local funds, homeland security funding	County Emergency Operations Plan, County Hazard Mitigation Plan	Identify population with special needs along with facilities in the county that house or work with the special needs population.
1.7.2	New	High	All hazards	Emergency services measure	County, County EMA, Police chief, City administrator, Fire chief, Mayor, School superintendent, School District Facilities Operations Director	Local funds, private funds & government programs, homeland security funding	County Emergency Operations Plan, County Hazard Mitigation Plan, Emergency management public education efforts	Identify existing special needs facilities, identify existing outdoor warning systems locations and determine if facility is within the audible range of the sirens. For the facilities within range make sure the facility employees are educated as to its use.
1.7.3	New	High	All hazards	Emergency services measure	County, County EMA, Police chief, Fire chief, City administrator, Mayor, School superintendent, School District Facilities Operations	Local funds, private funds & government programs, Federal & Red Cross funds	County Emergency Operations Plan, County Hazard	Work with local emergency response partners i.e. American Red Cross, Schools, County Health

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
					Director		Mitigation Plan, Emergency management public education efforts	Department, and municipalities to identify and establish special needs sheltering in Warren County.
1.8.1	New	Low	All hazards	Structural	County, County EMA, Mayor, School superintendent	Federal, State, Local funds, & government programs	County Emergency Operations Plan, County Hazard Mitigation Plan	Identify county road locations segments that could be as a firebreak or utilized for snow storage.
1.8.2	New	Medium	All hazards	Emergency services measure	County, County EMA, County assessor, Regional planning commission, Police chief, Mayor, School superintendent, School Director of Buildings & grounds	Federal, State, Local funds, & government programs, School District budget/bond issue	County Emergency Operations Plan, County Hazard Mitigation Plan, and Disaster Recovery Plan	Identify critical infrastructure within Warren County.
1.8.3	New	Low	All hazards	Public information	County, County EMA, Jurisdictions, Police chief, Regional planning commission, MoDOT, School superintendent, School District Facilities Operations Director	Federal, State, Local funds, & government programs, MoDOT roadway safety funding	Warren County online website, Regional transportation plan	Work with local and state law enforcement agencies to identify roads that have a large number traffic related incidents.
2.1.1	Ongoing	Low	Drought	Prevention tool	County farmers, County EMA, Jurisdictions, Police chief, School superintendent	Local funds, private funds, & government programs	MO DNR regulations	Working with the Missouri Department of Agriculture, local farm bureaus, University of Missouri to promote best agricultural practices.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
2.1.2	New	Low	All hazards	Prevention tool	Mo DNR, Mo Department of Agriculture, County EMA, Jurisdictions, Police chief, Mayor, Board of Alderman, School superintendent, School District Facilities Operations Director	Federal, State and private grants, local funds, private funds, & government programs	County Emergency Operations Plan	Identify potential environmental conflicts and implement regulations to address these issues.
2.1.3	Ongoing	Medium	Dams	Prevention tool	County EMA & dam owners, Jurisdictions, Mayor, School superintendent, School District Facilities Operations Director	Local funds, private funds, & government programs, SEMA, DNR	County Emergency Operations Plan, County Hazard Mitigation Plan, Emergency Actions Plan	Warren County has 32 regulated Dams in the county. In 2009 Warren was the pilot county for DNR for the development of Emergency Action Plans (EAP). Under a federal grant DNR has developed inundation maps for all 32 dams in Warren County. Warren County EMA has over laid the inundation maps on to the county's parcel data to identify the residential parcels downstream from each dam.
2.2.1	Ongoing	Medium	All hazards	Prevention tool	Planning & Zoning, Local fire districts, Building Commissioner, City Administrator & Building code committee, Board of Alderman, School superintendent, School District Facilities Operations	Local funds & government programs	Planning & Zoning regulations	While Warren County does have Planning & Zoning Regulations in place the adoption and enforcement of building codes are left up to the local fire districts/fire departments.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
					Director			
2.2.2	New	Low	Floods	Prevention tool	County Commission, City Building Commissioner, Mayor, City Administrator, School superintendent, School District Facilities Operations Director	Local funds & government programs	County Emergency Operations Plan	Review existing county regulatory orders and modify as needed
2.2.3	Ongoing	Low	Floods, drought	Prevention tool, Natural resource protection	County P & Z, City Building Commissioner, Mayor, Board of Alderman, County EMA, School superintendent	Prevention tool, Natural resource protection	County P & Z, City Building Commissioner, Mayor, Board of Alderman, County EMA, School superintendent	As growth continues in Warren county the County Commissioners will need to look at ways of addressing flash flooding issues caused by the lack of sufficient percolation on parcels being developed.
3.1.1	Ongoing	Medium	Floods, drought	Emergency services measure	County EMA, County first response agencies, Police Chief, Fire chief, Mayor, Board of Alderman, Grounds & maintenance director, City administrator & building code committee, School superintendent & Director of Special Services, School District Facilities Operations Director	Local funds, federal & private grant programs and government programs	County Emergency Operations Plan, Long range plan	Conduct building hazard analysis on all public critical structures and infrastructures. Identify critical areas that need to be addresses and prioritize these items. Develop long range plan to funds these projects.
3.1.2	Ongoing	Medium	All hazards	Emergency services measure	County EMA, County first response agencies, Police Chief, Fire chief, City administrator, School superintendent, School District Facilities Operations	Local funds, federal & private grant programs and government programs, School district	County Emergency Operations Plan, Disaster recovery plan,	Utilize the county's existing Hazard Analysis along with the 2010 All Hazard Mitigation Plan to identify access routes and evacuation routes.

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
					Director	funding/bond issue	County website	
3.1.3	New	High	All hazards	Prevention tool, Property protection, Structural mitigation control	County EMA, County first response agencies, Mayor, Board of Alderman, City public works director, City administrator, School superintendent, School District Facilities Operations Director	Local funds, federal & private grant programs and government programs	County Emergency Operations Plan, Disaster recovery plan, County website	Additional funding mechanisms should be sought.
3.1.4	New	Medium	Floods/levee failure	Prevention tool	County EMA, City administrator, Mayor, School superintendent, School District Facilities Operations Director	Local funds, federal & private grant programs and government programs	County Emergency Operations Plan, County hazard mitigation plan	The future plan is to walk the levees and gather GIS point data, so that the exact location of the levees can be plotted on the county's GIS data base.
3.2.1	Ongoing	High	All hazards	Public information	County EMA, County first response agencies, schools, businesses & other private organizations, City administrator, School superintendent, School district safety coordinator, School Board	Local funds, federal & private grant programs, government programs, and School district funding	County Emergency Operations Plan, County hazard mitigation plan	Warren County has a good working relationship among the jurisdictions within the county.
3.2.2	New	High	All hazards	Public information	County EMA, County first response agencies, City administrator, School superintendent, School Board	Local funds, federal & private grant programs and government programs	County Emergency Operations Plan, County hazard mitigation plan	The short term goal is to utilize members of the Local Emergency Planning Committee and members of the All Hazard Mitigation Plan Committee to form a Warren County

Action Plan	Status	Priority	Hazards addressed	Mitigation Category	Responsible Agency	Funding source	Incorporation into existing plans	Evaluation
								Emergency Committee. Planning

Village of Pendleton: The HAZUS-MH software didn't include the boundary files for the Village of Pendleton which was incorporated after the 2000 Census. Therefore, the building count data for Pendleton is unavailable during this plan update and this has been addressed under data limitations under Section 5. Village of Pendleton is concerned about the disaster from the derailment of the railroad which runs along it other than the above mentioned action plans. This has been rated as a high priority by the Village.