

Chapter 4: Mitigation Strategy

The third major step in the FEMA Hazard Mitigation Planning Process is the development of a five-year mitigation strategy for each jurisdiction. The chapter includes:

- Description of goals for hazard mitigation in the next five years;
- List of possible mitigation actions;
- Description of existing capabilities to address hazard mitigation;
- Evaluation of the proposed hazard mitigation actions to be considered in the next five years;
- The mitigation strategy by jurisdiction;

Clarke County Plan Update Changes to the Plan Structure

The previous plan broke out the topics of the mitigation strategy into numerous chapters. Upon review of other recently approved plans, it was determined that a new organization was easier to read and follow. It offers a better natural flow than the previous plan and reduces the complexity of the discussion. This chapter consolidates the outline of the previous plan and focuses on the capabilities to implement very specific mitigation actions. The number of actions to be considered is also reduced to make the more actionable.

The remaining parts of this chapter are organized as follows:

- **Section 4.1 - Status of Mitigation Actions** reviews the status of identified mitigation actions from the previous plan that expired in 2019;
- **Section 4.2 – Assessment of Mitigation Actions** outlines various topics, such as the FEMA-identified types of mitigation actions, that inform the reader about the other sections of the plan;
- **Section 4.3 - Goals and Objectives** identifies the goals and objectives identified by the planning team and planning consultant at the second planning meeting and with consideration of the previous plan’s goals and objectives;
- **Section 4.4 - Possible Mitigation Actions** lists possible mitigation actions (new and carryover) for each of the Priority 1 hazards for each participating jurisdiction;
- **Section 4.5 - Capability Assessment** describes the capabilities of each jurisdiction to address the various proposed mitigation actions outlined for them.
- **Section 4.6 - Evaluation Process for Alternative Mitigation Measures** details the STAPLE-E evaluation process.
- **Section 4.7 - Evaluation Results for Alternative Mitigation Measures** details the STAPLE-E evaluation results that are used for prioritization of hazard mitigation projects.
- **Section 4.8 - Selection of Alternative Measures by Jurisdiction** lists in a table the selected actions by jurisdiction for quick review.
- **Section 4.9 - Implementation Strategy by Jurisdiction** provides tables containing a timeline for the selected mitigation actions by jurisdiction along with possible leadership and priority rating.
- **Section 4.10 - Mitigation Action Summaries** provides details about mitigation actions selected, including primary hazards addressed, jurisdictions implementing, funding options, goals addressed, and benefits.
- **Section 4.11 - Implementation of the National Flood Insurance Program** provides additional information about compliance with the NFIP where applicable in the planning area.
- **Section 4.12 – Implementation of Climate Change Resilience Actions** provides a brief summary of climate change impacts on the county, as understood today.

4.1: Status of Mitigation Actions from the Previous Plan

The previous multi-jurisdictional plan adopted and approved in November 2014 outlined numerous hazard mitigation actions for the planning area’s jurisdictions. This section summarizes the status of carrying out

those proposed actions. For those actions that are “complete” or “ongoing”, the results are outlined. For “ongoing” projects, it is assumed that they will continue without adding them to the updated plan, unless otherwise noted. For those that are “not started” or “underway”, the plan states why they are not yet complete. These latter projects are potential considerations for “carryover” actions in the future mitigation strategy laid out in the second half of the chapter.

This part of the plan addresses the following Stafford Act requirement:

Section 201.6 (d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

Figure 4.1: Clarke County (Rural and County Assets in Any Location) Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|--|-------------|---|
| Create continuity of operations & succession plan for jurisdiction. | Ongoing | Plan in place and process of keeping it updated is established. |
| Implement/update and enforce zoning ordinances. | Completed | Countywide zoning updated within last five years. |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Underway | This is a long-term and very expensive project. A large part of county budget goes for secondary roads and will continue to do so. – <i>carryover</i> |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Replace bridges and culverts. | Underway | See the “improve transportation infrastructure” comment above. – <i>carryover</i> |
| Retrofit/harden existing overhead utility lines. | Underway | Some major utility lines have been improved and now withstand wind and ice but there are segments that need to be improved. – <i>carryover</i> |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Not started | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. – <i>carryover</i> |
| Adopt State fire codes. | Complete | Jurisdiction has adopted or enforces by default due to State enforcement. |
| Check and test water wells (clean when needed). | Ongoing | Funding is available for this purpose. |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Distribute tornado shelter location information. | Not started | Not relevant until FEMA rated shelters are in place. |
| Encourage private insurance purchase. | Not started | Something local leaders have not elected to do due to concern over interfering in private enterprise. – <i>carryover</i> |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Ongoing | Information is provided to residents and farmers by third parties. |
| Establish backup communications center or facilities. | Underway | Development of this infrastructure is now underway and will be completed without inclusion in this plan. |
| Flush dead end water mains. | Ongoing | SIRWA and other rural water providers already complete this in accordance with regulations as needed. |
| Full review of policy, procedure, and codes to include mitigation. | Ongoing | Process is ongoing as ordinances and codes are being updated. |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | Comprehensive plan update completed in 2017 includes some mitigation measures and a hazards section. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing | Process started with infrastructure providers and will continue without inclusion in plan update. |
| Obtain sand and salt supplies well in advance of winter. | Complete | Supplies are kept full and process is in place to acquire additional as needed. |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | Process is ongoing but informal and without a long-term rebate program. With the cell-based services now available, local interest in this has declined. |
| Require burial of power lines in new development. | Complete | This policy is in place within the County’s codes. |
| Business and residential preparedness programs. | Ongoing | This is a recurring educational effort by the EMA and other entities and will likely continue. |
| Develop a drought emergency plan, including water conservation measures. | Complete | This is a complicated matter because the County has limited role; much of effort provided by third parties. |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |

| Mitigation Action | Status | Comments |
|--|-------------|--|
| Implement GIS mapping system and utilize digital hazard maps. | Complete | GIS maps are in place with some hazard data layers available. |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely published in newspapers and on radio. |
| Construct public safe rooms in or near existing and future community assets and parks. | Not started | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. – <i>carryover</i> |
| Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | Not started | To date, the County has not chosen to participate in the program. More education on its need is required. – <i>carryover</i> |
| Promote the construction of private in-home tornado safe rooms. | Not started | No formal effort made. – <i>carryover</i> |
| Adopt Iowa Flood Center maps as official flood maps; seek FEMA FIRM status. | Complete | Maps are officially adopted. |
| Clear and deepen ditches on ROWs. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Construct storm water drainage (underground, culverts, curb & gutter, etc.) – improve ditches. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Demolish abandoned properties. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Develop a vegetation management plan. | Ongoing | Plan in place and enforced/implemented through relevant departments, but limited to County property and ROW. |
| Develop agreements for secondary water sources for use during droughts. | Ongoing | Resources are constantly being identified and procured. |
| Harden public buildings. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Identify and/or map erosion hazard areas. | Ongoing | This is an ongoing process as issues are identified; mapping system is in place; localized hazard |
| Install chain link fences around certain chemical tanks. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Install hazard signs in area campgrounds, parks, and open spaces. | Complete | Key recreational areas are identified; signs have been installed to direct people to relative safety. |
| Undertake stream modifications; add riprap and shoreline stabilization. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Bury utility lines in existing development. | Ongoing | This is now required in new subdivisions; existing areas are improved as funds are available. |
| Promote tree and vegetation maintenance on private properties. | Ongoing | This is provided through county ordinance and partnerships with insurance providers. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Not started | The major reservoir project remains on hold or in a long-term planning phase; cost is very high; other dams are inspected and maintained. – <i>carryover</i> |
| Raise grade to eliminate backup flooding, improve sewer lift station and/or water pump stations. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Install Interstate guardrails to protect water and natural areas. | Complete | This is and IDOT project complete throughout much of the region. |
| Install quick-connect emergency generator hook-ups for facilities. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Develop/implement a thorough recovery plan for power failure. | Ongoing | This primarily relates to private electrical providers, which have plans in place; plans are being amended as needed. |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers; incentive program. | Ongoing | This is handled by fire departments as resources are available and will be continued independently. |
| Utilize construction design that minimizes damage due to erosion. | Ongoing | Process in place for design and evaluation of public buildings. |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have worked together to identify needs and resources. |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Purchase/install backup fixed power generators and pumps. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Establish neighborhood watch programs for vulnerable populations. | Not started | This program does not make a lot of sense in a low-density rural area. |
| Repair structurally weak homes and do weatherization. | Ongoing | This is an ongoing process as funds are available and needs are identified. |

| Mitigation Action | Status | Comments |
|---|----------|---|
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Ongoing | The EMA and zoning office include these concepts in instructions to builders. |
| Special needs/oxygen user registration program. | Complete | Process in place and an active inventory exists. |

Figure 4.2: Murray Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|--|-------------|--|
| Create a continuity of operations & succession plan for the jurisdiction. | Not started | Project is under the authority of the private electrical provider. – <i>carryover</i> |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Flush dead end water mains. | Ongoing | This is performed according to regulations already in place. |
| Obtain sand and salt supplies well in advance of winter. | Complete | Supplies are kept full and process is in place to acquire additional as needed. |
| Adopt building codes (International Building Code (IBC) and International Residential Code (IRC)) to address various hazards. | Not started | City has not researched the options to date; will need to inform the City of advantages of this. – <i>carryover</i> |
| Adopt manufactured home development storm shelter ordinances. | Not started | City has not researched the options to date; will need to inform the City of advantages of this. – <i>carryover</i> |
| Check and test water wells (clean when needed). | Ongoing | Only a need for agricultural purposes; localized hazard; County program in place. |
| Clear and deepen ditches on ROWs. | Underway | Some projects/areas of town have been completed; City exploring other areas to be addressed in future. – <i>carryover</i> |
| Conduct study on possible illegal use of sump pumps and sewer lines. | Complete | This problem is addressed by relatively new city code. |
| Demolish abandoned properties. | Underway | Projects have been complete but several dilapidated properties remain a hazard. – <i>carryover</i> |
| Encourage private insurance purchase. | Not started | Something local leaders have not elected to do due to concern over interfering in private enterprise. – <i>carryover</i> |
| Full review of policy, procedure, and codes to include mitigation. | Not started | This is a time-consuming effort and the public leadership will need to understand what changes to policy, procedures, and codes should be considered. – <i>carryover</i> |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | Process is ongoing but informal and without a long-term rebate program. With the cell-based services now available, local interest in this has declined. |
| Promote tree and vegetation maintenance on private properties. | Ongoing | This is provided through city ordinance and partnerships with insurance providers |
| Purchase road closure barricades. | Not started | Due to the limited number of roads and few very localized hazards, such as river flooding that commonly close roads, this is not a necessary action for Murray. |
| Replace, expand, or improve water and sewer lines. | Complete | Major water and sewer main upgrade projects completed in the past five years. |
| Special needs/oxygen user registration program. | Not started | Local fire department has not created such a registry. Nor has the utility provider. – <i>carryover</i> |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Develop a vegetation management plan. | Not started | County will need to be informed on this topic; funds are limited, so priorities must be identified. – <i>carryover</i> |
| Develop/update/publicize city evacuation plans. | Ongoing | Plan in place and is practiced or exercised as needed. |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have worked together to identify needs and resources. |
| Implement GIS mapping system and utilize digital hazard maps. | Complete | GIS maps are in place with some hazard data layers available. |
| Improve storm water drainage system capacity. | Underway | Some areas have been improved but additional project areas have been identified for future investment. – <i>carryover</i> |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Not started | Existing plan is over twenty years old and city has not decided to update the plan due to the limited quantity of development. – <i>carryover</i> |
| Install backflow devises. | Ongoing | Policy requiring them is in place; enforcement is an ongoing process. |

| Mitigation Action | Status | Comments |
|---|-----------------------|---|
| Install quick-connect emergency generator hook-ups for facilities. | Not started | No investments yet made, as city does not have large occupied buildings and a portable generator. – <i>carryover</i> |
| Purchase stand-by portable pumps and generators. | Not started | None have been purchased. – <i>carryover</i> |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Establish neighborhood watch programs for vulnerable populations. | Not started | Requires local organization of an effort; leaders need to be informed of best practices and need. – <i>carryover</i> |
| Construct public safe rooms in or near existing and future community assets and parks. | Not started | Probably will make more sense when a major development project is contemplated. – <i>carryover</i> |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Not started | City plans a future street program now that underground infrastructure is in place. – <i>carryover</i> |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Complete; not started | These systems have been implemented in recent upgrades; electric/gas utility will implement this when it is ready without respect to the mitigation plan. |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Underway | Process is underway but funding is limited and it will take some time to fully modernize. – <i>carryover</i> |
| Establish backup communications center or facilities. | Underway | This is mostly a county-level effort and will not be provided at the city level. |
| Implement/update and enforce zoning ordinances. | Not started | No zoning is in place in Murray and will not be added until a comprehensive plan is adopted. – <i>carryover</i> |
| Purchase/install backup fixed power generators and pumps. | Not started | Since there are no large public buildings designated as shelters, this has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Distribute tornado shelter location information. | Not started | County-level activity; no FEMA shelters in place. |
| Harden public buildings. | Not started | With informed leaders, this can be completed as funds are available. – <i>carryover</i> |

Figure 4.3: Osceola Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|---|----------------------|---|
| Bury utility lines in existing development. | Not started | This is now required in new subdivisions; existing areas are improved at the will of the private utility provider. – <i>carryover</i> |
| Demolish abandoned properties. | Ongoing | Process and funding is in place and will continue without inclusion in the mitigation plan. |
| Encourage private insurance purchase. | Not started | Something local leaders have not elected to do due to concern over interfering in private enterprise. – <i>carryover</i> |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers; incentive program. | Underway | Fire department has taken some actions but more can be accomplished with more resources. – <i>carryover</i> |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Ongoing | Planning and funding have been invested in targeted parts of the city, mainly the “sponsored projects” in downtown and some other areas. |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing; not started | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this when it is ready without respect to the mitigation plan. |
| Integrate tornado safe room retrofits into critical assets/facilities. | Not started | No FEMA 361 safe rooms have been pursued, although larger public structures exist and could be retrofitted. - <i>carryover</i> |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Replace, expand, or improve water and sewer lines. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Clear and deepen ditches on ROWs. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Flush dead end water mains. | Ongoing | This is performed according to regulations already in place. |
| Implement/update and enforce zoning ordinances. | Ongoing | Zoning is in place and is being enforced. |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |

| Mitigation Action | Status | Comments |
|--|-------------|--|
| Promote the construction of private in-home tornado safe rooms. | Not started | EMA has not performed this level of education and promotion with individual property owners. – <i>carryover</i> |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Ongoing | The EMA and zoning office include these concepts in instructions to builders. |
| Construct public safe rooms in or near existing and future community assets and parks. | Not started | No FEMA 361 safe rooms have been pursued, although development is possible that can include a safe room (park shelters, etc.). – <i>carryover</i> |
| Harden public buildings. | Not started | With informed leaders, this can be completed as funds are available. – <i>carryover</i> |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Ongoing | This is being addressed in current “sponsored projects” and regular dam inspections protocols. |
| Install alternative or sustainable storm water control options such as buffer strips, bioswales, and rain gardens. | Underway | This is being addressed in current “sponsored projects” and will be completed independently. |
| Adopt Iowa Flood Center maps as official flood maps; seek FEMA FIRM status. | Complete | Maps are officially adopted. |
| Implement GIS mapping system and utilize digital hazard maps. | Complete | GIS maps are in place with some hazard data layers available. |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | Process is ongoing but informal and without a long-term rebate program. With the cell-based services now available, local interest in this has declined. |
| Raise grade to eliminate backup flooding, improve sewer lift station and/or water pump stations. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Complete a storm water drainage study for known problem areas. | Complete | This was completed as part of planning for the “sponsored projects” efforts. |
| Adopt manufactured home development storm shelter ordinances. | Not started | There are several manufactured homes areas but no ordinance addresses occupant wind safety. – <i>carryover</i> |
| Install new fire hydrants. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Encourage the use of porous pavement, vegetative buffers, and islands in large parking areas. | Underway | This is being addressed in current “sponsored projects” and will be completed independently. |
| Repair structurally weak homes and do weatherization. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Construct flood protection projects around water/sewer plants. | Underway | This is in progress right now at sewer plant; need at water plant has not been identified by local officials. |

Figure 4.4: Woodburn Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|--|-------------|--|
| Clear and deepen ditches on ROWs. | Not started | Resources have not been allocated to review needs at local level. – <i>carryover</i> |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment/systems. | Underway | Process is underway but funding is limited and it will take some time to fully modernize. – <i>carryover</i> |
| Replace bridges and culverts. | Not started | Resources have not been allocated to review needs at local level. – <i>carryover</i> |
| Flush dead end water mains. | Ongoing | This is performed according to regulations already in place. |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely published in newspapers and on radio. |
| Store digital and hard copies of public records in low-risk, offsite locations. | Not started | No formal process or procedure is in place. – <i>carryover</i> |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | Ongoing | Woodburn participates in the NFIP; the action of continuing to participate will <i>carryover</i> . |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Not started | Streets have not received significant investment in many years. – <i>carryover</i> |
| Construct storm water drainage (underground, culverts, curb & gutter, etc.) – improve ditches. | Not started | These systems have not received significant investment in many years. – <i>carryover (combine)</i> |

| Mitigation Action | Status | Comments |
|--|----------------------|---|
| Create continuity of operations & succession plan for jurisdiction. | Complete | Plan is now in place with EMA support. |
| Demolish abandoned properties. | Not started | Resources have not been allocated at local level. – <i>carryover</i> |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Ongoing | Provided at the county level; limited financial resources available locally. |
| Improve storm water drainage system capacity. | Not started | These systems have not received significant investment in many years. – <i>carryover (combine)</i> |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Not started | No comprehensive or land use plan has been implemented. – <i>carryover</i> |
| Purchase road closure barricades. | Not started | Because of the flood risks south of the downtown, City ownership of barricades makes sense. – <i>carryover</i> |
| Purchase/install backup fixed power generators and pumps. | Not started | Since there are no large public buildings designated as shelters, this has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Raise grade to eliminate backup flooding, improve sewer lift station and/or water pump stations. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Develop/update/publicize city evacuation plans. | Ongoing | Plan in place and is practiced or exercised as needed. |
| Repair structurally weak homes and do weatherization. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Construct public safe rooms in or near existing and future community assets and parks. | Not started | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. – <i>carryover</i> |
| Full review of policy, procedure, and codes to include mitigation. | Not started | This is a time-consuming effort and the public leadership will need to understand what changes to policy, procedures, and codes should be considered. – <i>carryover</i> |
| Implement GIS mapping system and utilize digital hazard maps. | Complete | GIS maps are in place with some hazard data layers available. |
| Undertake stream modifications; add riprap and shoreline stabilization. | Not started | These systems have not received significant investment in many years. – <i>carryover</i> |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing; not started | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this when it is ready without respect to the mitigation plan. |
| Install quick-connect emergency generator hook-ups for facilities. | Not started | No investments yet made, as city does not have large occupied buildings and a portable generator. – <i>carryover</i> |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Not started | Due to the lack of significant development potential in Woodburn and floodplains already being regulated, this is no longer a relevant action. |
| Elevate roads, bridges, and other infrastructure and critical assets. | Not started | Streets have not received significant investment in many years. – <i>carryover</i> |
| Harden public buildings. | Not started | With informed leaders, this can be completed as funds are available. – <i>carryover</i> |
| Integrate tornado safe room retrofits into critical assets/facilities. | Not started | No FEMA 361 safe rooms have been pursued, although public structures exist and could be retrofitted. - <i>carryover</i> |

Figure 4.5: Clarke Schools Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|---|-------------|--|
| Full review of policy, procedure, and codes to include mitigation. | Not started | This is a time-consuming effort and the public leadership will need to understand what changes to policy, procedures, and codes should be considered. – <i>carryover</i> |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by schools to parents, etc. |

| Mitigation Action | Status | Comments |
|--|-------------|---|
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have worked together to identify needs and resources. |
| Construct public safe rooms in or near existing and future schools. | Not started | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. – <i>carryover</i> |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Complete | School provides this role as much as it makes sense for the district, given school needs and safety concerns. |
| Integrate tornado safe room retrofits into critical assets/facilities. | Not started | No FEMA 361 safe rooms have been pursued, although existing schools could be retrofitted. - <i>carryover</i> |
| Purchase/install backup fixed power generators and pumps. | Not started | This has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Replace, expand, or improve water and sewer lines. | Complete | City of Osceola has addressed this need in relation to service to schools. |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Seasonal windbreaks are set in place where needed. |
| Bury utility lines in existing development. | Complete | School grounds have generally been addressed satisfactorily to the greatest possible extent. |

Figure 4.6: Murray Schools Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|--|----------------------|--|
| Create continuity of operations & succession plan for jurisdiction. | Complete | Plan is now in place with EMA support. |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Purchase stand-by portable pumps and generators. | Not started | This has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Not started | Existing school infrastructure plan does not specifically address mitigation. – <i>carryover</i> |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by schools to parents, etc. |
| Construct public safe rooms in or near existing and future schools. | Not started | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. – <i>carryover</i> |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have worked together to identify needs and resources. |
| Integrate tornado safe room retrofits into critical assets/facilities. | Not started | No FEMA 361 safe rooms have been pursued, although existing schools could be retrofitted. - <i>carryover</i> |
| Purchase/install backup fixed power generators and pumps. | Not started | This has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Develop and maintain security at applicable critical assets. | Underway | Implementation of measures and infrastructure have started; more can be done with more resources. – <i>carryover</i> . |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Complete | School provides this role as much as it makes sense for the district, given school needs and safety concerns. |
| Install backflow devises. | Complete | Sewer infrastructure at the school is modernized. |
| Install sprinkler systems. | Not started | Proper mitigation would be expensive in an older building of this size. – <i>carryover</i> |
| Replace, expand, or improve water and sewer lines. | Complete | Project has been completed in the City of Murray, including the connections to the school structures. |
| Bury utility lines in existing development. | Complete | School grounds have generally been addressed satisfactorily to the greatest possible extent. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing; not started | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this when it is ready on their own. |
| Investigate and implement alternative energy sources. | Not started | Not likely to be considered, due to the School relying on a private company to provide energy and the regulations involved in the investment. |

Figure 4.7: SWCC Osceola Campus Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|--|----------------------|--|
| Develop and maintain security at applicable critical assets. | Complete | Security systems in place. |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Create continuity of operations & succession plan for jurisdiction. | Complete | Plan is now in place with EMA support. |
| Full review of policy, procedure, and codes to include mitigation. | Not started | This is a time-consuming effort and the public leadership will need to understand what changes to policy, procedures, and codes should be considered. – <i>carryover</i> |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | SWCC as a whole has a plan in place for all public facilities with mitigation measures included. |
| Purchase/install backup fixed power generators and pumps. | Not started | This has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Purchase stand-by portable pumps and generators. | Not started | This has not been urgent; education of leaders may increase urgency. – <i>carryover</i> |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by schools to students, etc. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing; not started | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this when it is ready on their own. |

Figure 4.8: Clarke County Hospital Previous Mitigation Actions

| Mitigation Action | Status | Comments |
|---|-----------------------|---|
| Create continuity of operations & succession plan for jurisdiction. | Ongoing | Process started with school and support of EMA and State. |
| Incorporate stand-alone elements for hazard mitigation into the hospital’s planning effort. | Ongoing | Hospital has started this process and adds elements as needed. |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Business and residential preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Full review of policy, procedure, and codes to include mitigation. | Ongoing | This is in progress by key staff and board with consideration of best practices. |
| Increase the supply and availability of medical supplies for public health emergencies. | Ongoing | This was tested by COVID but the hospital has shown it can weather the storm with continued focus on procuring supplies before issues arise. |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Establish backup communications center or facilities. | Underway | Development of this infrastructure is now underway and will be completed without inclusion in the plan update. |
| Improve public awareness of hazard risks by dispensing print materials. | Ongoing | Print materials available at hospital; items are timely presented by hospital to patients, etc. |
| Harden public buildings. | Not started | With informed leaders, this can be completed as funds are available. – <i>carryover</i> |
| Install lightning protection of tall buildings and towers. | Complete | Installed at hospital recently. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Complete; not started | These systems have been implemented in recent upgrades; electric/gas utility will implement this when it is ready without respect to the mitigation plan. |

4.2: Assessment of Mitigation Actions

This section outlines some of the factors involved in the assessment of mitigation actions as the planning team considers which actions should be included in the plan update for the next five years. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Efforts by Federal, State, and local governments can restrict development in vulnerable areas, direct new development to less vulnerable areas, and promote ways to safeguard existing development in hazard-prone areas. Individuals can also participate through practicing sound personal safety and property protection measures. According to the 2013 FEMA

document “Local Mitigation Planning Handbook,” there are four major categories of mitigation actions, as outlined in the figure below.

Figure 4.9: Types or Categories of Mitigation Actions

| Mitigation Type | Description | Examples |
|---------------------------------------|---|--|
| Local Plans and Regulations | These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built. | <ul style="list-style-type: none"> • Comprehensive plans • Land use ordinances • Subdivision regulations • Development review • Building codes and enforcement • NFIP Community Rating System • Capital improvement programs • Open space preservation • Stormwater management regulations and master plans |
| Structure and Infrastructure Projects | <p>These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure.</p> <p>This type of action also involves projects to construct manmade structures to reduce the impact of hazards.</p> <p>Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program. <i>Task 9 - Create a Safe and Resilient Community</i> provides more information on these programs.</p> | <ul style="list-style-type: none"> • Acquisitions and elevations of structures in flood prone areas • Utility undergrounding • Structural retrofits. • Floodwalls and retaining walls • Detention and retention structures • Culverts • Safe rooms |
| Natural Systems Protection | These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. | <ul style="list-style-type: none"> • Sediment and erosion control • Stream corridor restoration • Forest management • Conservation easements • Wetland restoration and preservation |
| Education and Awareness Programs | These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady¹ or Firewise² Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. | <ul style="list-style-type: none"> • Radio or television spots • Websites with maps and information • Real estate disclosure • Presentations to school groups or neighborhood organizations • Mailings to residents in hazard-prone areas. • StormReady • Firewise Communities |

1 For more information on the National Weather Service's StormReady, see <http://www.stormready.noaa.gov/>.

2 For more information on the Firewise Communities program, see <http://www.firewise.org/>.

4.3: Mitigation Goals and Objectives

As we turn to the future of mitigation in Clarke County, it is important consider local goals and objectives, which the actions to be identified will address.

This part of the plan addresses the following Stafford Act requirement:

Section 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.

The Clarke County Hazard Mitigation Planning Team at its second meeting reviewed the risk assessment and other planning documents drafted to date. The intent of the review was to develop goals and objectives that would be fiscally feasible and yet highly beneficial. During the second meeting, the goals and objectives were created and initially evaluated.

The hazard goals are based on a four-pronged approach to emergency response, recognizing that mitigation actions affect all elements:

- **Preparedness** activities ensure the community and its residents are ready for a disaster and that they respond effectively. Preparedness involves determining what the community will do if essential services break down, developing a plan for contingencies, and practicing the plan.
- **Response** activities begin as soon as the disaster threatens. Response includes access control, search and rescue, mass care, medical services, and restoring essential services.
- **Recovery** activities help the community to return to pre-disaster condition. They include rebuilding services, infrastructure (utilities, communications, and transportation systems), facilities, operations, and the lives affected by the disaster.
- **Mitigation** activities are sustained actions that reduce the long-term risk of disasters. They reduce threats to the public health and safety, reduce or eliminate damages caused by disaster, and reduce the burden placed on local, state, and federal preparedness, response and recovery activities.

Clarke County Plan Update Changes to the Mitigation Goals and Objectives

While there is no fundamental problem or flaws with the existing goals and objectives, the planning team considered a new list of potential options, from which it selected goals and objectives for consideration. These new goals and objectives reflect updated issue statements resulting from the new risk assessment.

The planning team, with assistance from the public, the consultant, current local plans, elected officials, and FEMA/IHSEMD guidance, established the following goals, generally in order of significance, to make the county and all jurisdictions safer and more disaster resilient. The goals were created as part of the second planning team meeting using a survey process where the team members ranked language suggestions for numerous goals and objectives. These goals and objectives apply to all the currently participating and future participating jurisdictions in the countywide multi-jurisdictional plan.

Goal 1: Protect the health and safety of the public.

- Objective 1: Improve warning capabilities against hazards.
- Objective 2: Increase efforts to educate the public about hazards.
- Objective 3: Implement structural and property improvement projects that will result in protection of life and safety.
- Objective 4: Implement non-structural projects that will result in protection of life and safety.

Goal 2: Improve public response to hazards and make recovery easier.

- Objective 1: Enhance cross-agency and intra- and inter-county communications.
- Objective 2: Prepare plans and identify resources to facilitate government operations after a disaster.

Goal 3: Build and support local capacity and commitment to become continuously less vulnerable to hazards.

- Objective 1: Set aside funding for mitigation projects and apply for mitigation funds.
- Objective 2: Engage to a much greater level the private sector to address hazard mitigation.
- Objective 3: Provide education and training programs to increase public and responder awareness.
- Objective 4: Ensure the mitigation plan is reviewed and updated as needed.

Goal 4: Improve coordination and communication with other relevant organizations and remain compliant with mitigation requirements.

- Objective 1: Enhance and improve relations and communications with partner agencies.
- Objective 2: Focus attention on flooding and NFIP requirements.

Goal 5: Ensure economic vitality and continuity of local government during and after hazard events.

- Objective 1: Provide backup or redundancy systems for critical infrastructure and assets.
- Objective 2: Create innovative projects to prevent hazard losses in developed areas.
- Objective 3: Improve local codes and laws to ensure mitigation is considered in development and land use to reduce losses to future development.

Please note that the above goals and objectives were created by planning team members with consideration of the goals and objectives included in plans of similar counties and the previous Clarke County plan.

4.4: Possible Mitigation Actions

The next step in the development of a mitigation strategy is to formulate a “comprehensive range of mitigation actions” to apply to the various Priority 1 hazards outlined in Chapter 3 to which the planning area and its participating jurisdictions are vulnerable.

This part of the plan addresses the following Stafford Act requirement:

Section 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.

Based on numerous sources of mitigation action ideas, the consultant and planning team created the following policies, actions, programs, and projects that impact lives, properties, and community sustainability and resilience.

The work involved consideration of many lists of mitigation projects from the following sources:

- State of Iowa Hazard Mitigation Plans adopted in 2007, 2010, 2013, and 2018;
- Previous Clarke County Hazard Mitigation Plan;
- Other mitigation plans adopted in the region and recommended for review by FEMA Region VII and the Iowa HSEMD;
- FEMA resources, including the new “Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards” published in 2013.

Possible Mitigation Actions by Hazard Type

The following matrices include the list of potential mitigation actions that can address the Priority 1 Hazards as identified in Chapter 3. These do not include commonly known response actions, such as purchasing fire equipment or acquiring an ambulance. Only mitigation actions listed in this section are considered in the mitigation alternatives analysis/evaluation and strategies sections in the remaining chapters of this plan. In some cases, mitigation actions from the previous plan may be combined for brevity, while others may be expanded for clarity.

General Mitigation Alternatives Involving All Hazards:

The following table shows the identified possible mitigation actions to address all hazards in a general nature and are not specific to one or more priority hazards. The reason for this is to avoid the need for the planning team to evaluate each action for each hazard.

Figure 4.10: Mitigation Alternatives Involving All Hazards

| Mitigation Action | Primary Category |
|--|----------------------------------|
| Adopt a continuity of operations & succession plan for the jurisdiction. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Encourage property owners to own adequate property insurance. | Education and awareness programs |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Education and awareness programs |

| Mitigation Action | Primary Category |
|---|----------------------------------|
| Initiate community preparedness programs. | Education and awareness programs |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Education and awareness programs |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Education and awareness programs |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Local plans and regulations |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive plan, CIP, strategic plan, or other planning mechanisms. | Local plans and regulations |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Education and awareness programs |
| Participate and market the local Reverse E911 alert program. | Education and awareness programs |
| Provide more NOAA weather radios to the public if more grant funds can be obtained and promote the use of weather radio and other notification tools available to the public. | Education and awareness programs |
| Store digital and hard copies of public records in low-risk, offsite locations. | Local plans and regulations |

Drought Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address drought.

Figure 4.11: Mitigation Alternatives Involving Drought

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Natural systems protection |
| Check and test water wells (clean when needed). | Structure and infrastructure projects |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Structure and infrastructure projects |
| Develop a drought emergency plan, including water conservation measures. | Natural systems protection |
| Develop a vegetation management plan. | Natural systems protection |
| Develop agreements for secondary water sources for use during droughts. | Natural systems protection |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Natural systems protection |
| Enforce burning restrictions. | Prevention |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install pressure tanks/towers for potable water. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Replace, expand, or improve water and sewer lines. | Structure and infrastructure projects |
| Plan for and carry out efforts to add water supply for fire suppression. | Local plans and regulations |

Flood, Flash Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address flash flooding.

Figure 4.12: Mitigation Alternatives Involving Flash Flood

| Mitigation Action | Primary Category |
|---|---------------------------------------|
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Natural systems protection |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Structure and infrastructure projects |
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Adopt/enforce tree-trimming ordinances. | Local plans and regulations |
| Clear and deepen roadside ditches. | Structure and infrastructure projects |
| Complete storm water drainage or watershed studies of known flood areas. | Local plans and regulations |
| Conduct study on possible illegal use of sump pumps and sewer lines. | Local plans and regulations |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Structure and infrastructure projects |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Structure and infrastructure projects |
| Develop/update/publicize local evacuation and shelter-in-place plans. | Education and awareness programs |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Structure and infrastructure projects |
| Employ construction measures that direct water away from structures. | Structure and infrastructure projects |
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | Local plans and regulations |

| Mitigation Action | Primary Category |
|--|--|
| Encourage property owners to install sewer system backflow devices. | Education and awareness programs |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Education and awareness programs |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Flood proof critical assets in the community/construct flood protection around assets. | Structure and infrastructure projects |
| Harden public buildings and utilities (structural retrofits) | Structure and infrastructure projects |
| Identify and/or map erosion hazard areas. | Natural systems protection |
| Institute alternative bus routes and plans for road closures. | Local plans and regulations |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | Structure and infrastructure projects |
| Implement storm water management regulations. | Local plans and regulations |
| Implement stream modifications/channel improvements and stream bank stabilization. | Natural systems protection |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Structure and infrastructure projects |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install flood walls and retaining walls around critical infrastructure. | Structural and infrastructure projects |
| Install retention and detention structures. | Structural and infrastructure projects |
| Perform dam and levee inspections. | Local plans and regulations |
| Preserve open spaces in hazard areas. | Local plans and regulations |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Natural systems protection |
| Purchase road closure barricades. | Local plans and regulations |
| Purchase/install backup fixed power generators and pumps. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Flood, River Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address river flood events.

Figure 4.13: Mitigation Alternatives Involving River Flood

| Mitigation Action | Primary Category |
|--|--|
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Natural systems protection |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Structure and infrastructure projects |
| Adopt the current FIRM maps as applicable to each jurisdiction. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Complete storm water drainage or watershed studies of known flood areas. | Local plans and regulations |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Structure and infrastructure projects |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Structure and infrastructure projects |
| Implement all aspects of the NFIP (National Flood Insurance Program). | Local plans and regulations |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Structure and infrastructure projects |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Education and awareness programs |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Education and awareness programs |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Flood proof critical assets in the community/construct flood protection around assets. | Structural and infrastructure projects |
| Implement storm water management regulations. | Local plans and regulations |
| Implement stream modifications/channel improvements and stream bank stabilization. | Natural systems protection |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Structure and infrastructure projects |
| Install flood gauges. | Structure and infrastructure projects |
| Institute alternative bus routes and plans for road closures. | Local plans and regulations |
| Maintain sandbags in dry storage. | Structure and infrastructure projects |
| Participate in the FEMA Community Rating Service (CRS) program. | Local plans and regulations |

| Mitigation Action | Primary Category |
|---|---------------------------------------|
| Perform dam and levee inspections. | Local plans and regulations |
| Preserve open spaces in hazard areas. | Local plans and regulations |
| Purchase road closure barricades. | Local plans and regulations |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Hazardous Materials Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address hazardous materials.

Figure 4.14: Mitigation Alternatives Involving Hazardous Materials

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Structure and infrastructure projects |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Natural systems protection |
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Build highway or rail overpasses to reduce intersection accidents. | Structure and infrastructure projects |
| Check and test water wells (clean when needed). | Structure and infrastructure projects |
| Clear and deepen roadside ditches. | Structure and infrastructure projects |
| Codify restricted access procedures. | Local plans and regulations |
| Conduct study on possible illegal use of sump pumps and sewer lines. | Local plans and regulations |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Structure and infrastructure projects |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | Local plans and regulations |
| Create and maintain a special needs/oxygen user registration program or inventory. | Local plans and regulations |
| Designate/enforce HAZMAT transportation routes. | Local plans and regulations |
| Develop/maintain hazardous materials inventories by location. | Local plans and regulations |
| Develop/update/publicize local evacuation and shelter-in-place plans. | Education and awareness programs |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Structure and infrastructure projects |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Education and awareness programs |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Structure and infrastructure projects |
| Encourage property owners to install sewer system backflow devices. | Education and awareness programs |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | Structure and infrastructure projects |
| Install access barriers around certain chemical tanks. | Structure and infrastructure projects |
| Install air monitors at critical assets and population centers. | Structure and infrastructure projects |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | Structure and infrastructure projects |
| Install pressure tanks/towers for potable water. | Structure and infrastructure projects |
| Install sprinkler systems in public buildings. | Structure and infrastructure projects |
| Institute alternative bus routes and plans for road closures. | Local plans and regulations |
| Plan for and carry out efforts to add water supply for fire suppression. | Local plans and regulations |
| Post “no dumping” signs. | Education and awareness programs |
| Provide rail and highway safety education programs for youth. | Education and awareness programs |
| Purchase road closure barricades. | Local plans and regulations |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Remove asbestos from public buildings. | Natural systems protection |
| Routinely inspect fire hydrants. | Local plans and regulations |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Infrastructure Failure Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address hazardous infrastructure failure.

Figure 4.15: Mitigation Alternatives Involving Infrastructure Failure

| Mitigation Action | Primary Category |
|--|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Structure and infrastructure projects |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Natural systems protection |
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Adopt State fire codes. | Local plans and regulations |
| Adopt/enforce tree-trimming ordinances. | Local plans and regulations |
| Bridge and culvert improvements and upsizing. | Structure and infrastructure projects |
| Bury exposed utility and communications infrastructure. | Structure and infrastructure projects |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Structure and infrastructure projects |
| Demolish abandoned properties. | Structure and infrastructure projects |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Structure and infrastructure projects |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Education and awareness programs |
| Encourage property owners to install sewer system backflow devices. | Education and awareness programs |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Education and awareness programs |
| Enforce multi-family housing extinguisher laws. | Local plans and regulations |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Flood proof critical assets in the community/construct flood protection around assets. | Structural and infrastructure projects |
| Fund weatherization programs to more low-income households. | Structure and infrastructure projects |
| Harden public buildings and utilities (structural retrofits). | Structure and infrastructure projects |
| Implement storm water management regulations. | Local plans and regulations |
| Implement stream modifications/channel improvements and stream bank stabilization. | Natural systems protection |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Structure and infrastructure projects |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install access barriers around certain chemical tanks. | Structure and infrastructure projects |
| Install and/update anti-virus software and emergency communications technology. | Local plans and regulations |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | Structure and infrastructure projects |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Structure and infrastructure projects |
| Install sprinkler systems in public buildings. | Structure and infrastructure projects |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Structure and infrastructure projects |
| Maintain trees proactively on public property and ROW areas. | Local plans and regulations |
| Plan for and carry out efforts to add water supply for fire suppression. | Local plans and regulations |
| Post “no dumping” signs. | Education and awareness programs |
| Prepare and practice a mass casualty plan. | Local plans and regulations |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Natural systems protection |
| Purchase/install backup fixed power generators and pumps. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Require burial of utility lines in new development. | Local plans and regulations |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Local plans and regulations |
| Routinely inspect fire hydrants. | Local plans and regulations |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Severe Winter Storm Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address severe winter storm events.

Figure 4.16: Mitigation Alternatives Involving Severe Winter Storm

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Adopt/enforce tree trimming ordinances. | Local plans and regulations |
| Bury exposed utility and communications infrastructure. | Structure and infrastructure projects |

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Create and maintain a special needs/oxygen user registration program or inventory. | Local plans and regulations |
| Develop/enforce snow removal policies. | Local plans and regulations |
| Fund weatherization programs to more low-income households. | Structure and infrastructure projects |
| Harden public buildings and utilities (structural retrofits). | Structure and infrastructure projects |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install highway guardrails to keep vehicles on roadway. | Structure and infrastructure projects |
| Install quick-connect emergency generator hook-ups for facilities. | Structure and infrastructure projects |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Structure and infrastructure projects |
| Institute alternative bus routes and plans for road closures. | Local plans and regulations |
| Maintain trees proactively on public property and ROW areas. | Local plans and regulations |
| Obtain sand and salt supplies well in advance of winter. | Local plans and regulations |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Natural systems protection |
| Purchase road closure barricades. | Local plans and regulations |
| Purchase snow trucks, plows, sanders. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Purchase/install backup fixed power generators and pumps. | Structure and infrastructure projects |
| Require burial of utility lines in new development. | Local plans and regulations |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Thunderstorm/Lightning/Hail Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address thunderstorm/lightning/hail.

Figure 4.17: Mitigation Alternatives Involving Thunderstorm/Lighting/Hail

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Adopt/enforce tree trimming ordinances. | Local plans and regulations |
| Bury exposed utility and communications infrastructure. | Structure and infrastructure projects |
| Create and maintain a special needs/oxygen user registration program or inventory. | Local plans and regulations |
| Demolish abandoned properties. | Structure and infrastructure projects |
| Enforce nuisance regulations to rid the area of debris that could be a hazard. | Local plans and regulations |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Fund weatherization programs to more low-income households. | Structure and infrastructure projects |
| Harden public buildings and utilities (structural retrofits). | Structure and infrastructure projects |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install hazard signs in area campgrounds, parks, and open spaces. | Education and awareness programs |
| Install warning siren(s). | Structure and infrastructure projects |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Structure and infrastructure projects |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Structure and infrastructure projects |
| Promote annual storm spotter training. | Education and awareness programs |
| Promote the value of installation of private in-home tornado safe rooms. | Education and awareness programs |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Education and awareness programs |
| Purchase/install backup fixed power generators and pumps. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Require burial of utility lines in new development. | Local plans and regulations |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Education and awareness programs |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

Tornado/Windstorm Mitigation Alternatives:

The following table shows the identified possible mitigation actions to address tornado/windstorm.

Figure 4.18: Mitigation Alternatives Involving Tornado/Windstorm

| Mitigation Action | Primary Category |
|--|---------------------------------------|
| Adopt International Building Code and/or International Residential Code. | Local plans and regulations |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Local plans and regulations |
| Adopt manufactured home development storm shelter ordinances. | Local plans and regulations |
| Adopt/enforce tree trimming ordinances. | Local plans and regulations |
| Bury exposed utility and communications infrastructure. | Structure and infrastructure projects |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Structure and infrastructure projects |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Structure and infrastructure projects |
| Create and maintain a special needs/oxygen user registration program or inventory. | Local plans and regulations |
| Demolish abandoned properties. | Structure and infrastructure projects |
| Distribute tornado shelter location information. | Education and awareness programs |
| Enforce burning restrictions. | Local plans and regulations |
| Enforce nuisance regulations to rid the area of debris that could be a hazard. | Local plans and regulations |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Natural systems protection |
| Fund weatherization programs to more low-income households. | Structure and infrastructure projects |
| Harden public buildings and utilities (structural retrofits). | Structure and infrastructure projects |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Structure and infrastructure projects |
| Install hazard signs in area campgrounds, parks, and open spaces. | Education and awareness programs |
| Install highway guardrails to keep vehicles on roadway. | Structure and infrastructure projects |
| Install warning siren(s). | Structure and infrastructure projects |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Structure and infrastructure projects |
| Institute alternative bus routes and plans for road closures. | Local plans and regulations |
| Maintain trees proactively on public property and ROW areas. | Local plans and regulations |
| Prepare and practice a mass casualty plan. | Local plans and regulations |
| Promote annual storm spotter training. | Education and awareness programs |
| Promote the value of installation of private in-home tornado safe rooms. | Education and awareness programs |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Natural systems protection |
| Provide safe room education for builders and developers. | Education and awareness programs |
| Purchase road closure barricades. | Local plans and regulations |
| Purchase/install backup fixed power generators and pumps. | Structure and infrastructure projects |
| Purchase stand-by portable pumps and generators. | Structure and infrastructure projects |
| Require burial of utility lines in new development. | Local plans and regulations |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Education and awareness programs |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Structure and infrastructure projects |

The above tables, while lengthy, offer a comprehensive range of actions that can address the many hazards identified in the plan. This information is the foundation for the following pages that outline future mitigation actions that should be undertaken by the jurisdictions participating in the plan.

Status of Possible Mitigation Actions by Jurisdiction

The following tables show the general status of mitigation actions, from the tables above, relevant to each jurisdiction. Projects that are completed or ongoing are not to be included in the new plan, even though ongoing activities will still have an impact. It is assumed that ongoing activities will continue without the plan being implemented. New, underway, or carryover activities will be considered in the evaluation and prioritization sections of the plan and may be included in the implementation strategy. New actions are items not previously anticipated, either in a previous plan or in general. Underway items may or may not be in the previous plan but are being implemented to some degree and are eligible for inclusion as a future action. Carryover actions are from the previous plan and were not implemented but may make sense to include in the new plan. Some new and carryover actions may be removed from future consideration because they are not relevant, per comments, to a given jurisdiction.

Clarke County (Rural and County-owned Facilities) Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Clarke County’s rural area and critical assets and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.19: Potential Mitigation Actions for Clarke County

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | FEMA priority |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Carryover | |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | New | FEMA priority |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Ongoing | FEMA priority |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Complete | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Ongoing | |
| Adopt International Building Code and/or International Residential Code. | New | |
| Adopt manufactured home development storm shelter ordinances. | New | At least one major mobile home area exists. |
| Adopt State fire codes. | Complete | |
| Adopt the current FIRM maps as applicable to each jurisdiction. | Complete | FEMA priority |
| Adopt/enforce tree trimming ordinances. | New | |
| Build highway or rail overpasses to reduce intersection accidents. | New | |
| Bury exposed utility and communications infrastructure. | Ongoing | |
| Check and test water wells (clean when needed). | Ongoing | |
| Clear and deepen ditches on ROWs. | Ongoing | As funding allows |
| Codify restricted access procedures. | New | |
| Complete storm water drainage or watershed studies of known flood areas. | New | Some areas have been studied previously. |
| Conduct study on possible illegal use of sump pumps and sewer lines. | New | New project but not really an issue in rural unincorporated areas. |
| Consider local Reverse E911 participation – promote to the public. | Complete | Statewide program in place in which county participates. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Carryover | Large lake project has been in design for years. |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Complete | |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Ongoing | Not a major concern in rural unincorporated areas. |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | FEMA priority |
| Create and maintain a special needs/oxygen user registration program or inventory. | Complete | Always being updated and maintained. |
| Demolish abandoned properties. | Ongoing | |
| Designate/enforce HAZMAT transportation routes. | Complete | In place |
| Develop a drought emergency plan, including water conservation measures. | Complete | Adopted by county officials; may need revisions in future. |
| Develop a vegetation management plan. | Complete | Adopted by county officials; may need revisions in future. |
| Develop agreements for secondary water sources for use during droughts. | Ongoing | |
| Develop an electronic directory of local and other resources. | Ongoing | |
| Develop/enforce snow removal policies. | Complete | Minor issue in rural area. Already has removal order in place. |
| Develop/implement a thorough recovery plan for power failure. | Ongoing | |
| Develop/maintain hazardous materials inventories by location. | Ongoing | |
| Develop/update/publicize local evacuation and shelter-in-place plans. | New | |
| Distribute tornado shelter location information. | Carryover | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Ongoing | FEMA priority |
| Employ construction measures that direct water away from structures. | Ongoing | As part of construction standards policy for public infrastructure |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Ongoing | Efforts performed by non-County officials meet the level of need identified by County leaders. |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | Ongoing | Updated subdivision regulations include this concept for obvious hazards. |
| Encourage property owners to install sewer system backflow devices. | New | Not a significant issue in rural areas. |
| Encourage property owners to own adequate property insurance. | Carryover | |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Ongoing | Efforts performed by non-County officials meet the level of need identified by County leaders. |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | New | |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Ongoing | Efforts performed by non-County officials meet the level of need identified by County leaders. |
| Enforce burning restrictions. | Ongoing | |
| Enforce multi-family housing extinguisher laws. | New | Not a significant issue in rural areas. |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Complete | Efforts performed by non-County officials meet the level of need identified by County leaders. |
| Establish neighborhood watch programs for vulnerable populations. | Carryover | This program does not make a lot of sense in a low-density rural area. |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | |
| Flood proof critical assets in the community/construct flood protection around assets. | New | |
| Flush dead end water mains. | Ongoing | |
| Fund weatherization programs to more low-income households. | Ongoing | More can be accomplished with other non-mitigation funds |
| Harden public buildings and utilities (structural retrofits). | Ongoing | FEMA priority; as funds are available |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Identify and/or map erosion hazard areas. | Ongoing | |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | |
| Implement all aspects of the NFIP (National Flood Insurance Program). | Carryover | FEMA priority; county is not participating at this time |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | New | Not a significant issue in rural unincorporated areas |
| Implement storm water management regulations. | New | |
| Implement stream modifications/channel improvements and stream bank stabilization. | Ongoing | |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Carryover | |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | FEMA priority; plan updated in 2017 includes hazards chapter. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing | |
| Initiate community preparedness programs. | Ongoing | FEMA priority |
| Install access barriers around certain chemical tanks. | Ongoing | |
| Install air monitors at critical assets and population centers. | New | |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | Complete | Adequate numbers and distribution of hydrants exists to meet current needs. |
| Install flood gauges. | New | Size of rivers may not justify, so an inquiry is needed. |
| Install hazard signs in area campgrounds, parks, and open spaces. | Complete | |
| Install Interstate guardrails to protect water and natural areas. | Complete | |
| Install pressure tanks/towers for potable water. | Complete | |
| Install quick-connect emergency generator hook-ups for facilities. | Ongoing | |
| Install retention and detention structures. | New | FEMA priority |

| Potential Mitigation Action | Status | Comments |
|--|------------------|---|
| Install sprinkler systems in public buildings. | Complete | Provided where required and where it makes sense based on use and safety concerns. |
| Install warning siren(s). | Underway and new | There are several in the county but they are aging and some key areas need service. |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Provided where needed to satisfaction of County leaders. |
| Institute alternative bus routes and plans for road closures. | Ongoing | Process in place with Schools to address closures. |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | New | |
| Maintain sandbags in dry storage. | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | Secondary Roads and Conservation Board address adequately. |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | FEMA priority |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Participate in the FEMA Community Rating Service (CRS) program. | New | FEMA priority |
| Perform dam and levee inspections. | Ongoing | Provided by third parties as regulated through State. |
| Plan for and carry out efforts to add water supply for fire suppression. | Underway | Collaboration with regional water suppliers and a possible lake project |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | New | |
| Post “no dumping” signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | Part of existing emergency operations plan |
| Preserve open spaces in hazard areas. | New | |
| Promote annual storm spotter training. | Ongoing | |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | FEMA priority |
| Promote the value of installation of private in-home tornado safe rooms. | Carryover | |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Ongoing | |
| Provide rail and highway safety education programs for youth. | Ongoing | |
| Provide safe room education for builders and developers. | New | FEMA priority |
| Purchase road closure barricades. | Complete | |
| Purchase snow trucks, plows, sanders. | Ongoing | As funding is available |
| Purchase stand-by portable pumps and generators. | Ongoing | |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | |
| Purchase/install backup fixed power generators and pumps. | Ongoing | |
| Remove asbestos from public buildings. | Ongoing | As investments are made |
| Replace/upsized bridges and culverts. | Carryover | Needs always exceed available funds. |
| Require burial of power lines in new development. | Complete | |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Ongoing | |
| Routinely inspect fire hydrants. | Ongoing | Few hydrants in rural areas |
| Store digital and hard copies of public records in low-risk, offsite locations. | Ongoing | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Carryover | Existing NOI submitted for this type of project |
| Utilize construction design that minimizes damage due to erosion. | Ongoing | |

City of Murray Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Murray and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.20: Potential Mitigation Actions for the City of Murray

| Potential Mitigation Action | Status | Comments |
|--|--------|---------------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | FEMA priority |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|---|
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | New | FEMA priority |
| Adopt a continuity of operations & succession plan for the jurisdiction. | New | FEMA priority |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Carryover | |
| Adopt International Building Code and/or International Residential Code. | Carryover | |
| Adopt manufactured home development storm shelter ordinances. | Carryover | |
| Adopt State fire codes. | New | |
| Adopt/enforce tree trimming ordinances. | New | |
| Bridge and culvert improvements and upsizing. | New | |
| Bury exposed utility and communications infrastructure. | New | Most of such infrastructure owned by third parties. |
| Check and test water wells (clean when needed). | Ongoing | |
| Clear and deepen ditches on ROWs. | Carryover | |
| Complete storm water drainage or watershed studies of known flood areas. | Complete | Completed by engineering team around 2016-17 for storm water priorities mapping |
| Conduct study on possible illegal use of sump pumps and sewer lines. | Complete | This problem is addressed by relatively new city code. |
| Consider local Reverse E911 participation – promote to the public. | Ongoing | |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | |
| Construct storage facilities for pesticides, insecticides, and chemicals. | New | |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Underway | |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | New | FEMA priority |
| Create a continuity of operations & succession plan for the jurisdiction. | Carryover | |
| Create and maintain a special needs/oxygen user registration program or inventory. | Carryover | |
| Demolish abandoned properties. | Carryover | |
| Develop a vegetation management plan. | Carryover | |
| Develop an electronic directory of local and other resources. | Ongoing | |
| Develop/enforce snow removal policies. | Complete | |
| Develop/update/publicize local evacuation and shelter-in-place plans. | Ongoing | |
| Distribute tornado shelter location information. | Carryover | County-level activity; no FEMA shelters in place; does not make sense until shelters are built. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | New | |
| Employ construction measures that direct water away from structures. | New | |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | |
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | New | |
| Encourage property owners to install sewer system backflow devices. | Ongoing | |
| Encourage property owners to own adequate property insurance. | Carryover | |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | New | |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | New | |
| Enforce burning restrictions. | New | |
| Enforce multi-family housing extinguisher laws. | New | |
| Establish alert systems and specific outreach efforts for vulnerable populations. | New | |
| Establish neighborhood watch programs for vulnerable populations. | Carryover | |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Underway | |
| Flood proof critical assets in the community/construct flood protection around assets. | New | |
| Flush dead end water mains. | Ongoing | |
| Fund weatherization programs to more low-income households. | Underway | City has a program in place for six houses, but need extends beyond and more programs are needed. |
| Harden public buildings and utilities (structural retrofits) | Carryover | FEMA priority |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | |

| Potential Mitigation Action | Status | Comments |
|--|---------------------|---|
| Identify and/or map erosion hazard areas. | Complete | Completed by engineering team around 2016-17 for storm water priorities mapping |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | Complete | |
| Implement storm water management regulations. | Underway | A storm water utility has been set up and funded but has only limited regulations. |
| Implement stream modifications/channel improvements and stream bank stabilization. | New | Two small streams pass through developed areas of the city. |
| Improve storm water drainage system capacity. | Carryover; Underway | Some areas have been improved but additional project areas have been identified for future investment. |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Carryover | |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Carryover | |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Complete | These systems have been implemented in recent upgrades; electric/gas utility will implement on its own. |
| Initiate community preparedness programs. | Ongoing | FEMA priority |
| Install access barriers around certain chemical tanks. | New | |
| Install and/update anti-virus software and emergency communications technology. | New | |
| Install backflow devises. | Ongoing | Policy requiring them is in place; enforcement is an ongoing process. |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | City is covered by wet hydrants so this action is unneeded. |
| Install flood walls and retaining walls around critical infrastructure. | New | There are no flood-prone infrastructures and facilities that could be served by a floodwall. |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | |
| Install highway guardrails to keep vehicles on roadway. | New | No major highways with high speeds exist in the city. |
| Install quick-connect emergency generator hook-ups for facilities. | Carryover | |
| Install retention and detention structures. | New | FEMA priority |
| Install sprinkler systems in public buildings. | New | No large buildings in the city, other than the school, which participates separately. |
| Install warning siren(s). | Complete | FEMA priority |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | New | |
| Institute alternative bus routes and plans for road closures. | New | |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain trees proactively on public property and ROW areas. | New | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | |
| Obtain sand and salt supplies well in advance of winter. | Complete | Supplies are kept full and process is in place to acquire additional as needed. |
| Perform dam and levee inspections. | New | No dams and levees in town or immediate area. |
| Plan for and carry out efforts to add water supply for fire suppression. | Complete | Adequate supplies are available to meet local needs. |
| Post “no dumping” signs. | New | |
| Prepare and practice a mass casualty plan. | Ongoing | Part of existing emergency operations plan |
| Preserve open spaces in hazard areas. | New | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | Process is ongoing but informal and without a long-term rebate program. With the cell-based services now available, local interest in this has declined. |
| Promote the value of installation of private in-home tornado safe rooms. | New | |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Ongoing | This is provided through city ordinance and partnerships with insurance providers |
| Provide safe room education for builders and developers. | New | |
| Purchase road closure barricades. | Carryover | Remains an issue until roads are improved and all storm water projects are completed. |
| Purchase stand-by portable pumps and generators. | Carryover | |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Underway | |
| Purchase/install backup fixed power generators and pumps. | Carryover | Since there are no large public buildings designated as shelters, this has not been urgent; education of leaders may increase urgency. |
| Replace, expand, or improve water and sewer lines. | Complete | Major water and sewer main upgrade projects completed in the past five years. |
| Require burial of utility lines in new development. | New | |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | New | |
| Routinely inspect fire hydrants. | Ongoing | |
| Store digital and hard copies of public records in low-risk, offsite locations. | New | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

City of Osceola Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Osceola and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.21: Potential Mitigation Actions for the City of Osceola

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | FEMA priority |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | New | FEMA priority |
| Adopt a continuity of operations & succession plan for the jurisdiction. | New | FEMA priority |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | New | |
| Adopt International Building Code and/or International Residential Code. | Complete | |
| Adopt manufactured home development storm shelter ordinances. | Carryover | |
| Adopt State fire codes. | Complete | |
| Adopt the current FIRM maps as applicable to each jurisdiction. | Complete | Maps are officially adopted. |
| Adopt/enforce tree trimming ordinances. | Complete | |
| Bridge and culvert improvements and upsizing. | New | |
| Build highway or rail overpasses to reduce intersection accidents. | New | |
| Bury exposed utility and communications infrastructure. | Carryover | This is now required in new subdivisions; existing areas are improved at the will of the private utility provider. |
| Check and test water wells (clean when needed). | Ongoing | |
| Clear and deepen ditches on ROWs. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Codify restricted access procedures. | New | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Complete storm water drainage or watershed studies of known flood areas. | Complete | This was completed as part of planning for the “sponsored projects” efforts. |
| Conduct study on possible illegal use of sump pumps and sewer lines. | Complete | |
| Consider local Reverse E911 participation – promote to the public. | Complete | Statewide program in place in which county participates. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Ongoing | This is being addressed in current “sponsored projects” and regular dam inspections protocols. |
| Construct storage facilities for pesticides, insecticides, and chemicals. | New | Not relevant; no significant need in the city boundaries. |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Underway | Some areas are being addressed with "sponsored projects," but not entire city. |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | Development is possible that can include a safe room (park shelters, etc.). |
| Create and maintain a special needs/oxygen user registration program or inventory. | New | |
| Demolish abandoned properties. | Ongoing | Process and funding is in place and will continue on its own. |
| Designate/enforce HAZMAT transportation routes. | Complete | |
| Develop/enforce snow removal policies. | Complete | |
| Develop/maintain hazardous materials inventories by location. | Ongoing | |
| Develop/update/publicize local evacuation and shelter-in-place plans. | New | |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Ongoing | Completed as funds are available without reference to plan. |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Ongoing | City's fire dept recently obtained a large FEMA AFG fire prevention grant that will improve outreach. |
| Encourage property owners to install sewer system backflow devices. | Ongoing | |
| Encourage property owners to own adequate property insurance. | Carryover | |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Ongoing | Planning and funding have been invested in targeted areas, mainly the “sponsored projects” in downtown and some other areas. |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | New | |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Underway | This is being addressed in current “sponsored projects." Not all area of town impacted by this project. |
| Enforce burning restrictions. | Ongoing | |
| Enforce multi-family housing extinguisher laws. | Ongoing | |
| Establish alert systems and specific outreach efforts for vulnerable populations. | New | |
| Facilitate the cleanup of abandoned properties, unused chemical storage, and other potential environmental hazards. | Underway | |
| Flood proof critical assets in the community/construct flood protection around assets. | Underway | This is in progress right now at sewer plant. |
| Flush dead end water mains. | Ongoing | This is performed according to regulations already in place. |
| Fund weatherization programs to more low-income households. | Underway | A program is in place but needs expand well beyond current funding. |
| Harden public buildings and utilities (structural retrofits) | Carryover | FEMA priority; as funds are available |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement all aspects of the NFIP (National Flood Insurance Program). | New | FEMA priority; city is not participating at this time. |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | New | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|---|
| Implement storm water management regulations. | New | |
| Implement stream modifications/channel improvements and stream bank stabilization. | Underway | Part of "sponsored projects," but more areas can be addressed with future funds. |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | FEMA priority; plan updated in 2017 includes hazards chapter. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this on own schedule. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | Ongoing | |
| Install air monitors at critical assets and population centers. | New | |
| Install/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | City is covered by wet hydrants so this action is unneeded. |
| Install flood gauges. | New | Size of rivers may not justify, so an inquiry is needed. |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | |
| Install highway guardrails to keep vehicles on roadway. | New | Not relevant; no significant need in the city boundaries. |
| Install new fire hydrants. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Install pressure tanks/towers for potable water. | Complete | |
| Install quick-connect emergency generator hook-ups for facilities. | New | FEMA priority |
| Install sprinkler systems in public buildings. | New | |
| Install warning siren(s). | New | |
| Install windbreaks (permanent and seasonal). Use snow fences or "living snow fences" (e.g. rows of trees or other vegetation) to limit wind effects. | New | |
| Institute alternative bus routes and plans for road closures. | New | |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain sandbags in dry storage. | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Participate in the FEMA Community Rating Service (CRS) program. | New | FEMA priority |
| Perform dam and levee inspections. | Ongoing | |
| Plan for and carry out efforts to add water supply for fire suppression. | New | |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | Ongoing | |
| Post "no dumping" signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | Part of existing emergency operations plan |
| Preserve open spaces in hazard areas. | New | |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue. |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | FEMA priority |
| Promote the value of installation of private in-home tornado safe rooms. | Carryover | |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | |
| Provide rail and highway safety education programs for youth. | Ongoing | |
| Provide safe room education for builders and developers. | New | FEMA priority |
| Purchase road closure barricades. | Complete | |
| Purchase snow trucks, plows, sanders. | Ongoing | |
| Purchase stand-by portable pumps and generators. | Ongoing | |
| Purchase/install backup fixed power generators and pumps. | Ongoing | |
| Remove asbestos from public buildings. | Ongoing | |

| Potential Mitigation Action | Status | Comments |
|---|----------|---|
| Replace, expand, or improve water and sewer lines. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Require burial of utility lines in new development. | Complete | |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Ongoing | The EMA and zoning office include these concepts in instructions to builders. |
| Routinely inspect fire hydrants. | Ongoing | |
| Store digital and hard copies of public records in low-risk, offsite locations. | Complete | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

City of Woodburn Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Woodburn and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.22: Potential Mitigation Actions for the City of Woodburn

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | FEMA priority |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Carryover | Due to the lack of significant development potential in Woodburn and floodplains already being regulated, this is no longer a relevant action. |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | New | FEMA priority |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Carryover | FEMA priority |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Carryover | |
| Adopt International Building Code and/or International Residential Code. | New | |
| Adopt manufactured home development storm shelter ordinances. | New | Not required, as there are no major mobile home developments. |
| Adopt State fire codes. | New | |
| Adopt the current FIRM maps as applicable to each jurisdiction. | Complete | Maps are officially adopted. |
| Adopt/enforce tree trimming ordinances. | New | |
| Bridge and culvert improvements and upsizing. | Carryover | |
| Bury exposed utility and communications infrastructure. | New | |
| Clear and deepen ditches on ROWs. | Carryover | |
| Complete storm water drainage or watershed studies of known flood areas. | New | |
| Consider local Reverse E911 participation – promote to the public. | Complete | Statewide program in place in which county participates. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | |
| Construct storage facilities for pesticides, insecticides, and chemicals. | New | |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Carryover | |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | FEMA priority |
| Create and maintain a special needs/oxygen user registration program or inventory. | New | |
| Demolish abandoned properties. | Carryover | |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Develop/enforce snow removal policies. | Ongoing | |
| Develop/update/publicize city evacuation plans. | Ongoing | Plan in place and is practiced or exercised as needed. |
| Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | Carryover | Woodburn participates in the NFIP; the action of continuing to participate will carryover. |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Carryover | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | |
| Encourage property owners to install sewer system backflow devices. | New | |
| Encourage property owners to own adequate property insurance. | New | |
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | New | |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | New | |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | New | |
| Enforce burning restrictions. | Ongoing | |
| Enforce multi-family housing extinguisher laws. | Ongoing | Not relevant to Woodburn as there is no MF housing |
| Establish alert systems and specific outreach efforts for vulnerable populations. | New | |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | |
| Flood proof critical assets in the community/construct flood protection around assets. | New | FEMA priority |
| Flush dead end water mains. | Ongoing | This is performed according to regulations already in place. |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Ongoing | Provided at the county level; limited financial resources available locally. |
| Fund weatherization programs to more low-income households. | New | |
| Harden public buildings and utilities (structural retrofits). | Carryover | |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely published in newspapers and on radio. |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement all aspects of the NFIP (National Flood Insurance Program). | Ongoing | FEMA priority; City participates. |
| Implement storm water management regulations. | New | |
| Implement stream modifications/channel improvements and stream bank stabilization. | Carryover | |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | Carryover | Streets have not received significant investment in many years. |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Carryover | No comprehensive or land use plan has been implemented. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Carryover | Much of this is out of the hand of the City, as third party entities supply. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | New | No significant chemical areas need protected. |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | City is covered by wet hydrants so this action is unneeded. |
| Install flood gauges. | New | Size of rivers may not justify, so an inquiry is needed. |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | No significant park and recreation areas that warrant specific signage. |
| Install highway guardrails to keep vehicles on roadway. | New | No major highways with high speeds exist in the city. |
| Install quick-connect emergency generator hook-ups for facilities. | Carryover | FEMA priority |
| Install sprinkler systems in public buildings. | New | No large buildings in the city. |
| Install warning siren(s). | New | |
| Install windbreaks (permanent and seasonal). Use snow fences or "living snow fences" (e.g. rows of trees or other vegetation) to limit wind effects. | New | |
| Institute alternative bus routes and plans for road closures. | New | |

| Potential Mitigation Action | Status | Comments |
|--|---------------------|--|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | New | |
| Maintain sandbags in dry storage. | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | Primarily a function of third-party utility provider |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | No buildings over about 50' in the city; no occupied buildings over 25'. |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Participate in the FEMA Community Rating Service (CRS) program. | New | |
| Perform dam and levee inspections. | New | No dams and levees are in the area or local jurisdiction. |
| Plan for and carry out efforts to add water supply for fire suppression. | New | |
| Post "no dumping" signs. | New | |
| Prepare and practice a mass casualty plan. | Ongoing | Part of existing emergency operations plan |
| Preserve open spaces in hazard areas. | New | |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Promote the value of installation of private in-home tornado safe rooms. | New | |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | |
| Promote NOAA weather radio – rebate incentive for citizen purchase. | Ongoing | FEMA priority |
| Provide safe room education for builders and developers. | New | |
| Purchase road closure barricades. | Carryover | Because of the flood risks south of the downtown, City ownership of barricades makes sense. |
| Purchase snow trucks, plows, sanders. | New | |
| Purchase stand-by portable pumps and generators. | New | |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment/systems. | Carryover; Underway | Process is underway but funding is limited and it will take some time to fully modernize. |
| Purchase/install backup fixed power generators and pumps. | Carryover | Since there are no large public buildings designated as shelters, this has not been urgent; education of leaders may increase urgency. |
| Require burial of utility lines in new development. | New | |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | New | |
| Routinely inspect fire hydrants. | Ongoing | |
| Store digital and hard copies of public records in low-risk, offsite locations. | Carryover | No formal process or procedure is in place. |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

Clarke School District Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Clarke Community School District property and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.23: Potential Mitigation Actions for the Clarke School District

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | Not relevant to the school district properties |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | Not relevant |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Complete | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Carryover | This is a time-consuming effort and leadership will need to understand what changes to policy, procedures, and codes should be considered. |
| Adopt International Building Code and/or International Residential Code. | Complete | Design standards in place for school district properties |
| Adopt manufactured home development storm shelter ordinances. | New | Not relevant |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Adopt State fire codes. | Complete | |
| Adopt/enforce tree trimming ordinances. | New | Not relevant |
| Bridge and culvert improvements and upsizing. | New | Not relevant |
| Bury exposed utility and communications infrastructure. | Complete | School grounds have generally been addressed satisfactorily to the greatest possible extent. |
| Consider local Reverse E911 participation – promote to the public. | Complete | Statewide program in place in which county participates. |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | FEMA priority |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | Not relevant |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Complete | All chemicals used in school property are managed and secure. |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | Resources have not yet been made available; more education on the value of this measure and where this measure is specifically needed. |
| Create and maintain a special needs/oxygen user registration program or inventory. | New | Not relevant |
| Demolish abandoned properties. | New | Not relevant |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Develop/enforce snow removal policies. | Ongoing | |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | New | Not relevant |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | Not relevant |
| Encourage property owners to install sewer system backflow devices. | New | Not relevant |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Ongoing | Already part of school's design standards |
| Enforce burning restrictions. | New | Not relevant |
| Enforce multi-family housing extinguisher laws. | New | Not relevant |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Complete | System to alert staff, students, and parent is in place. |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | Not relevant |
| Flood proof critical assets in the community/construct flood protection around assets. | New | Not relevant |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Complete | School provides this role as much as it makes sense for the district, given school needs and safety concerns. |
| Fund weatherization programs to more low-income households. | New | Not relevant |
| Harden public buildings and utilities (structural retrofits) | New | |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have worked together to identify needs and resources. |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by schools to parents, etc. |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement storm water management regulations. | New | Not relevant |
| Implement stream modifications/channel improvements and stream bank stabilization. | New | Not relevant |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Complete | Roads are will maintained. |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | School property plan addresses hazards |

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Complete | School district reported adequately supported. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | New | Not relevant |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | Not relevant |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | Could apply to outdoor sports facilities |
| Install highway guardrails to keep vehicles on roadway. | New | Not relevant |
| Install quick-connect emergency generator hook-ups for facilities. | New | Not relevant |
| Install sprinkler systems in public buildings. | Complete | School buildings meet this part of fire code. |
| Install warning siren(s). | Complete | Areas of schools covered by the City's sirens. |
| Install windbreaks (permanent and seasonal). Use snow fences or "living snow fences" (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Seasonal windbreaks are set in place where needed. |
| Institute alternative bus routes and plans for road closures. | Ongoing | In place and updated as needed |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Complete | |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Plan for and carry out efforts to add water supply for fire suppression. | New | Not relevant |
| Post "no dumping" signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Promote the value of installation of private in-home tornado safe rooms. | New | Not relevant |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | Not relevant |
| Provide more NOAA weather radios to the public if more grant funds can be obtained and promote the use of weather radio and other notification tools available to the public. | Complete | Weather radio in place |
| Provide safe room education for builders and developers. | New | Not relevant |
| Purchase road closure barricades. | Complete | |
| Purchase snow trucks, plows, sanders. | Complete | No replacement needed for at least five years. |
| Purchase stand-by portable pumps and generators. | New | |
| Purchase/install backup fixed power generators and pumps. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Replace, expand, or improve water and sewer lines. | Complete | City of Osceola has addressed this need in relation to service to schools. |
| Require burial of utility lines in new development. | Complete | Already part of school's design standards |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Complete | Already part of school's design standards |
| Routinely inspect fire hydrants. | New | City of Osceola has addressed this need in relation to service to schools. |
| Store digital and hard copies of public records in low-risk, offsite locations. | New | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

Murray School District Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Murray Community School District property and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.23: Potential Mitigation Actions for the Murray School District

| Potential Mitigation Action | Status | Comments |
|---|---------------------|---|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | Not relevant to the school district properties |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | Not relevant |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Complete | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | New | This is a time-consuming effort and the public leadership will need to understand what changes to policy, procedures, and codes should be considered. |
| Adopt International Building Code and/or International Residential Code. | Complete | Design standards in place for school district properties |
| Adopt manufactured home development storm shelter ordinances. | New | Not relevant |
| Adopt State fire codes. | Complete | |
| Adopt/enforce tree-trimming ordinances. | New | Not relevant |
| Bridge and culvert improvements and upsizing. | New | Not relevant |
| Bury exposed utility and communications infrastructure. | Complete | School grounds have generally been addressed satisfactorily to the greatest possible extent. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | Not relevant |
| Consider local Reverse E911 participation – promote to the public. | Complete | Statewide program in place in which county participates. |
| Construct storage facilities for pesticides, insecticides, and chemicals. | New | Not relevant |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Carryover | FEMA priority |
| Create and maintain a special needs/oxygen user registration program or inventory. | New | Not relevant |
| Create continuity of operations & succession plan for jurisdiction. | Complete | Plan is now in place with EMA support. |
| Demolish abandoned properties. | New | Not relevant |
| Develop an electronic directory of local and other resources. | Ongoing | EMA office maintains this type of data and continues to grow the database over time. |
| Develop and maintain security at applicable critical assets. | Underway; Carryover | Implementation of measures and infrastructure have started; more can be done with more resources. – carryover. |
| Develop/enforce snow removal policies. | Ongoing | |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | New | |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | Not relevant |
| Encourage property owners to install sewer system backflow devices. | New | Not relevant |
| Encourage property owners to own adequate property insurance. | New | Not relevant |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Ongoing | Already part of school's design standards |
| Enforce burning restrictions. | New | Not relevant |
| Enforce multi-family housing extinguisher laws. | New | Not relevant |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Complete | System to alert staff, students, and parent is in place. |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | Not relevant |
| Flood proof critical assets in the community/construct flood protection around assets. | New | Not relevant |
| Formally designate and stock community post disaster shelters; maintain and publicize shelter location list. | Complete | School provides this role as much as it makes sense for the district, given school needs and safety concerns. |
| Fund weatherization programs to more low-income households. | New | Not relevant |
| Harden public buildings and utilities (structural retrofits). | New | |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Identify specific at-risk populations that may be exceptionally vulnerable and organize outreach to them. | Ongoing | The EMA and other offices that serve these populations have |

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | worked together to identify needs and resources. Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by schools to parents, etc. |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement storm water management regulations. | New | Not relevant |
| Implement stream modifications/channel improvements and stream bank stabilization. | New | Not relevant |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | New | |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | School property plan addresses hazards |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this independently. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | New | Not relevant |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install backflow devises. | Complete | Sewer infrastructure at the school is modernized. |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | Not relevant to the school district properties |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | Could apply to outdoor sports facilities but already addressed by drills and “recess monitors.” |
| Install highway guardrails to keep vehicles on roadway. | New | Not relevant |
| Install quick-connect emergency generator hook-ups for facilities. | New | |
| Install sprinkler systems in public buildings. | Carryover | Proper mitigation would be expensive in an older building of this size. |
| Install warning siren(s). | Complete | Areas of schools covered by the City’s sirens. |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Seasonal windbreaks are set in place where needed. |
| Institute alternative bus routes and plans for road closures. | Ongoing | In place and updated as needed |
| Investigate and implement alternative energy sources. | Carryover | Not likely to be considered, due to the School relying on a private company to provide energy and the regulations involved in the investment. |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Plan for and carry out efforts to add water supply for fire suppression. | New | Not relevant |
| Post “no dumping” signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Promote the value of installation of private in-home tornado safe rooms. | New | Not relevant |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | Not relevant |
| Provide more NOAA weather radios to the public if more grant funds can be obtained and promote the use of weather radio and other notification tools available to the public. | Complete | Weather radio in place |
| Provide safe room education for builders and developers. | New | Not relevant |
| Purchase road closure barricades. | Complete | |

| Potential Mitigation Action | Status | Comments |
|--|-----------|---|
| Purchase snow trucks, plows, sanders. | New | |
| Purchase stand-by portable pumps and generators. | Carryover | This has not been urgent; education of leaders may increase urgency. – carryover |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Purchase/install backup fixed power generators and pumps. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Replace, expand, or improve water and sewer lines. | Complete | Project has been completed in the City of Murray, including the connections to the school structures. |
| Require burial of utility lines in new development. | Complete | Already part of school's design standards |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Complete | Already part of school's design standards |
| Routinely inspect fire hydrants. | New | City of Murray has addressed this need in relation to service to schools. |
| Store digital and hard copies of public records in low-risk, offsite locations. | New | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

SWCC Osceola Campus Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact the SWCC Osceola Campus property and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.24: Potential Mitigation Actions for the SWCC Osceola Campus

| Potential Mitigation Action | Status | Comments |
|---|----------|--|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | Not relevant to the SWCC campus property |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | Not relevant |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Complete | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Complete | |
| Adopt International Building Code and/or International Residential Code. | Complete | Design standards in place for SWCC properties |
| Adopt manufactured home development storm shelter ordinances. | New | Not relevant |
| Adopt State fire codes. | Complete | |
| Adopt/enforce tree trimming ordinances. | Complete | Not relevant |
| Bridge and culvert improvements and upsizing. | Complete | Not relevant |
| Bury exposed utility and communications infrastructure. | Complete | Complete to authority of the college and on its own property |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | Not relevant |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Complete | |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | New | |
| Create and maintain a special needs/oxygen user registration program or inventory. | New | Not relevant |
| Create continuity of operations & succession plan for jurisdiction. | Complete | Plan is now in place with EMA support. |
| Demolish abandoned properties. | New | Not relevant to the SWCC campus property |
| Develop and maintain security at applicable critical assets. | Complete | Security systems in place. |
| Develop/enforce snow removal policies. | Ongoing | |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | New | Not relevant |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | Not relevant |
| Encourage property owners to install sewer system backflow devices. | New | Not relevant |

| Potential Mitigation Action | Status | Comments |
|--|----------|---|
| Encourage property owners to own adequate property insurance. | New | Not relevant |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Ongoing | Already part of college's design standards |
| Enforce burning restrictions. | New | Not relevant |
| Enforce multi-family housing extinguisher laws. | New | Not relevant |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Complete | System to alert staff, students, and visitors is in place. |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | Not relevant |
| Flood proof critical assets in the community/construct flood protection around assets. | New | Property is located on a hilltop and unlikely to flood. |
| Fund weatherization programs to more low-income households. | New | Not relevant |
| Harden public buildings and utilities (structural retrofits). | Complete | Very modern building built to latest standards overall |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by SWCC to students, etc. |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement storm water management regulations. | New | Not relevant |
| Implement stream modifications/channel improvements and stream bank stabilization. | New | Not relevant |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | New | |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Complete | SWCC as a whole has a plan in place for all public facilities with mitigation measures included. |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. | Ongoing | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this when it is ready without respect to the mitigation plan. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | New | Not relevant |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | Not relevant |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | Not relevant |
| Install highway guardrails to keep vehicles on roadway. | New | Not relevant |
| Install quick-connect emergency generator hook-ups for facilities. | New | |
| Install sprinkler systems in public buildings. | Complete | |
| Install warning siren(s). | Complete | Areas of campus covered by the City's sirens. |
| Install windbreaks (permanent and seasonal). Use snow fences or "living snow fences" (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Seasonal windbreaks are set in place where needed. |
| Institute alternative bus routes and plans for road closures. | New | Not relevant |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | New | Not relevant |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Participate and market the local Reverse E911 alert program. | New | Not relevant |
| Plan for and carry out efforts to add water supply for fire suppression. | New | Not relevant |
| Post "no dumping" signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | |
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue independently. |
| Promote the value of installation of private in-home tornado safe rooms. | New | Not relevant |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | Not relevant |

| Potential Mitigation Action | Status | Comments |
|---|-----------|---|
| Provide more NOAA weather radios to the public if more grant funds can be obtained and promote the use of weather radio and other notification tools available to the public. | Complete | Weather radio in place |
| Provide safe room education for builders and developers. | New | College has potential role through its building trades program |
| Purchase road closure barricades. | Complete | |
| Purchase snow trucks, plows, sanders. | New | |
| Purchase stand-by portable pumps and generators. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Purchase/install backup fixed power generators and pumps. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Require burial of utility lines in new development. | Complete | Already part of SWCC's design standards |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Complete | Already part of SWCC's design standards |
| Routinely inspect fire hydrants. | New | City of Osceola has addressed this need in relation to service to SWCC. |
| Store digital and hard copies of public records in low-risk, offsite locations. | New | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

Clarke County Hospital Status of Potential Mitigation Actions:

Based on the priority hazards that are most likely to impact Clarke County Hospital property and the lists of possible actions from the tables above, the following is a summary of possible mitigation actions to be considered in the following parts of the plan.

Figure 4.25: Potential Mitigation Actions for the Clarke County Hospital

| Potential Mitigation Action | Status | Comments |
|---|----------|---|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | New | Not relevant to the hospital campus property |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | New | Not relevant |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Complete | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Ongoing | |
| Adopt International Building Code and/or International Residential Code. | Complete | Design standards in place for hospital properties |
| Adopt manufactured home development storm shelter ordinances. | New | Not relevant |
| Adopt State fire codes. | Complete | |
| Adopt/enforce tree trimming ordinances. | Complete | Not relevant |
| Bridge and culvert improvements and upsizing. | Complete | Not relevant |
| Bury exposed utility and communications infrastructure. | Complete | Complete to authority of the hospital and on its own property |
| Consider local Reverse E911 participation. | Complete | Statewide program in place in which county participates. |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | New | Not relevant |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Complete | |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | New | |
| Create and maintain a special needs/oxygen user registration program or inventory. | Complete | Policies related to this are well established at facility. |
| Create continuity of operations & succession plan for jurisdiction. | Ongoing | Process started with school and support of EMA and State. |
| Demolish abandoned properties. | New | Not relevant |
| Develop/enforce snow removal policies. | Ongoing | |
| Distribute tornado shelter location information. | New | Not relevant until FEMA rated shelters are in place. |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | New | |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | New | Not relevant |
| Encourage property owners to install sewer system backflow devices. | New | Not relevant |
| Encourage property owners to own adequate property insurance. | New | Not relevant |

| Potential Mitigation Action | Status | Comments |
|--|-----------|--|
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Ongoing | Already part of hospital's design standards |
| Enforce burning restrictions. | New | Not relevant |
| Enforce multi-family housing extinguisher laws. | New | Not relevant |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Complete | System to alert staff, patients, and visitors is in place. |
| Establish backup communications center or facilities. | Underway | Development of this infrastructure is now underway and will be completed without inclusion in the plan update. |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | New | Not relevant |
| Flood proof critical assets in the community/construct flood protection around assets. | New | Property is located on a hilltop and unlikely to flood. |
| Fund weatherization programs to more low-income households. | New | Not relevant |
| Harden public buildings and utilities (structural retrofits). | Carryover | With informed leaders, this can be completed as funds are available. |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | New | A requisite action |
| Implement a comprehensive multi-media public education campaign for multiple hazards. | Ongoing | Print materials available at EMA office and other locations where the public goes to learn about hazards; items are timely presented by the hospital to patients, etc. |
| Implement a GIS mapping system and utilize digital hazard maps for various kinds of hazards; keep data updated. | Complete | GIS maps are in place with some hazard data layers available. |
| Implement storm water management regulations. | New | Not relevant |
| Implement stream modifications/channel improvements and stream bank stabilization. | New | Not relevant |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | New | |
| Incorporate stand-alone elements for hazard mitigation into the hospital's planning effort. | Ongoing | Hospital has started this process and adds elements as needed. |
| Increase production capacity; install redundant systems and looping (water, sewer, electric, gas). | Ongoing | This is an ongoing process as funds are available and needs are identified; electric/gas utility will implement this independently. |
| Increase the supply and availability of medical supplies for public health emergencies. | Ongoing | This was tested by COVID but the hospital has shown it can weather the storm with continued focus on procuring supplies before issues arise. |
| Initiate community preparedness programs. | Ongoing | Provided by EMA and business/economic development partners as needed. |
| Install access barriers around certain chemical tanks. | New | Not relevant |
| Install and/update anti-virus software and emergency communications technology. | Ongoing | |
| Install dry hydrants in areas without appropriate water mains and domestic fire hydrants. | New | Not relevant |
| Install hazard signs in area campgrounds, parks, and open spaces. | New | Not relevant |
| Install highway guardrails to keep vehicles on roadway. | New | Not relevant |
| Install quick-connect emergency generator hook-ups for facilities. | New | |
| Install sprinkler systems in public buildings. | Complete | |
| Install warning siren(s). | Complete | Areas of campus covered by the City's sirens. |
| Install windbreaks (permanent and seasonal). Use snow fences or "living snow fences" (e.g. rows of trees or other vegetation) to limit wind effects. | Complete | Seasonal windbreaks are set in place where needed. |
| Institute alternative bus routes and plans for road closures. | New | Not relevant to the hospital campus property |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | New | |
| Maintain trees proactively on public property and ROW areas. | Ongoing | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Complete | Installed at hospital recently. |
| Obtain sand and salt supplies well in advance of winter. | Ongoing | |
| Participate and market the local Reverse E911 alert program. | New | Not relevant |
| Plan for and carry out efforts to add water supply for fire suppression. | New | Not relevant |
| Post "no dumping" signs. | Complete | |
| Prepare and practice a mass casualty plan. | Ongoing | |

| Potential Mitigation Action | Status | Comments |
|---|-----------|--|
| Promote annual storm spotter training. | Ongoing | This is an established practice and will continue without inclusion in the plan. |
| Promote the value of installation of private in-home tornado safe rooms. | New | Not relevant |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | New | Not relevant |
| Provide more NOAA weather radios to the public if more grant funds can be obtained and promote the use of weather radio and other notification tools available to the public. | Complete | Weather radio in place |
| Provide safe room education for builders and developers. | New | Not relevant |
| Purchase road closure barricades. | Complete | |
| Purchase snow trucks, plows, sanders. | New | |
| Purchase stand-by portable pumps and generators. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Ongoing | This is an ongoing process as funds are available and needs are identified. |
| Purchase/install backup fixed power generators and pumps. | Carryover | This has not been urgent; education of leaders may increase urgency. |
| Require burial of utility lines in new development. | Complete | Already part of school's design standards |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Complete | Already part of SWCC's design standards |
| Routinely inspect fire hydrants. | New | City of Osceola has addressed this need in relation to service to the hospital. |
| Store digital and hard copies of public records in low-risk, offsite locations. | Ongoing | Creston SWCC campus provides a second location. |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | New | |

4.5: Capability Assessment by Jurisdiction for Possible Future Mitigation Actions

This section elaborates on the evaluation factors of exiting jurisdictional capabilities and evaluates possible future mitigation actions to determine which ones should be considered for implementation in the next five years.

Review Category: Existing Authorities

Existing authorities are the governments, staffing, and other legal entities that have authority to undertake a specific mitigation action to address identified hazards. Generally, in Clarke County the primary authority is the specific jurisdiction in which the action will be undertaken. However, as listed of the tables in this chapter, sometimes the targeted jurisdiction is partnering, secondary, or simply affected by someone else’s authority. An example is the City of Woodburn, which has delegated authority to supply water and to treat wastewater to SIRWA and electricity to Alliant Energy. Some mitigation actions that might make a lot of sense for a jurisdiction can be eliminated from the final strategy because the jurisdiction lacks authority to implement it and the existing authority has no interest.

Other authorities include FEMA and other State and Federal agencies. These authorities might implement a project without local input as to whether it should be included in the local plan. For this reason, some mitigation actions might be implemented or cancelled depending on these external authorities that are beyond the scope of the local planning process. The authorities are also described in the tables of this plan.

The relationship between authorities and the actions in this strategy can be expounded so that capabilities are improved if all parties read and accept the strategy outlined in this plan. While external authorities are not required to adopt the plan, they can accept the strategy and include projects and ideas in their budgets and policies. Also, through potential changes in State and Federal laws and regulations, local authorities can have more power to implement projects, through such things as expanded local taxation powers and ability to be more flexible with local budgets and program funding. Local staff limitations, especially in small jurisdictions, also are significant.

Review Category: Existing Policies

Existing policies have been created to address mitigation issues. Most local jurisdictions' policies are geared toward other elements of the emergency management: response and recovery. Less local emphasis in policies is found in preparedness and mitigation, leaving much of that emphasis to FEMA, the State of Iowa, and other agencies. There are notable exceptions, usually where hazard mitigation is incidental to other local priorities. For example, some jurisdictions have building codes or zoning to address general quality of life issues. These ordinances do not necessarily consider modern mitigation best practices for things like wildfire prevention and wind protection. However, as a mitigation action, jurisdictions should consider such best practices when reviewing and updating ordinances. In the area of public warning and education, the jurisdictions have policies in place directed toward mitigation. These policies are more easily implemented because of the modest cost.

Locally, the key inhibitors to policymaking for mitigation are as follows: a) financial, b) under-appreciation of hazard risks, c) lack of political will to implement something new or not specifically mandated by another level of government, d) lack of awareness of the policy option and need for it, and e) lack of staffing and expertise to carry out the policy. Several of these inhibitions can be overcome by participating in the planning process and reading the final plan. Others, such as the staffing and financial concerns, will take more support from FEMA, the State, and other organizations to overcome. The tables in this section also detail some of the policy issues for the various mitigation actions.

Review Category: Existing Programs

Locally, there are relatively few existing mitigation programs, and many of them that exist are operated by the Clarke County Emergency Management Agency. As opposed to projects, which are often one-time investments in things like infrastructure and are implemented by all jurisdictions, mitigation programs tend to be recurring or continuous, and many of these are among the “ongoing” and “carryover” actions listed in the first part of the chapter. The EMA is responsible for coordinating numerous agencies, staff and volunteers, funding mechanisms, and programs, many of which have State and Federal resources.

With appropriate funding and staffing, local jurisdictions can initiate and implement substantial programs that can continuously and sustainably mitigate hazards. These might include training and educational efforts, permitting and certification programs, and other recurring activities. Without funding and staffing, local jurisdictions lack the means to expand these capabilities. Grant funds from various agencies, often focused on projects because elected officials and staff see tangible benefits from them, should also be used to develop and sustain long-term programs that can potentially affect more people. It takes much time and effort to put these into effect, often longer than the terms of existing elected officials. When this is the case, outside assistance is often necessary to motivate action and coordinate the effort.

Review Category: Existing Resources

Often, the greatest limitation to local hazard mitigation strategy implementation is the lack of local funding. Iowa's property and sales tax laws are the primary methods for funding local government operations, including Cities, Counties, School Districts, and others. Some organizations, such as schools and hospitals, also receive fees for services. Increasingly, due to the many now antiquated laws for these taxes, local governments have had to become more creative in raising funding, such as the imposition of local option taxes, tax increment financing for infrastructure projects, special taxing districts, a growing array of fees and enterprise funds, investments, bonding in increasing amounts, and government resource sharing. Similarly, old laws that require certain offices in each jurisdiction and a growing range of State and Federal mandates and regulations also make normal operations more difficult for small communities.

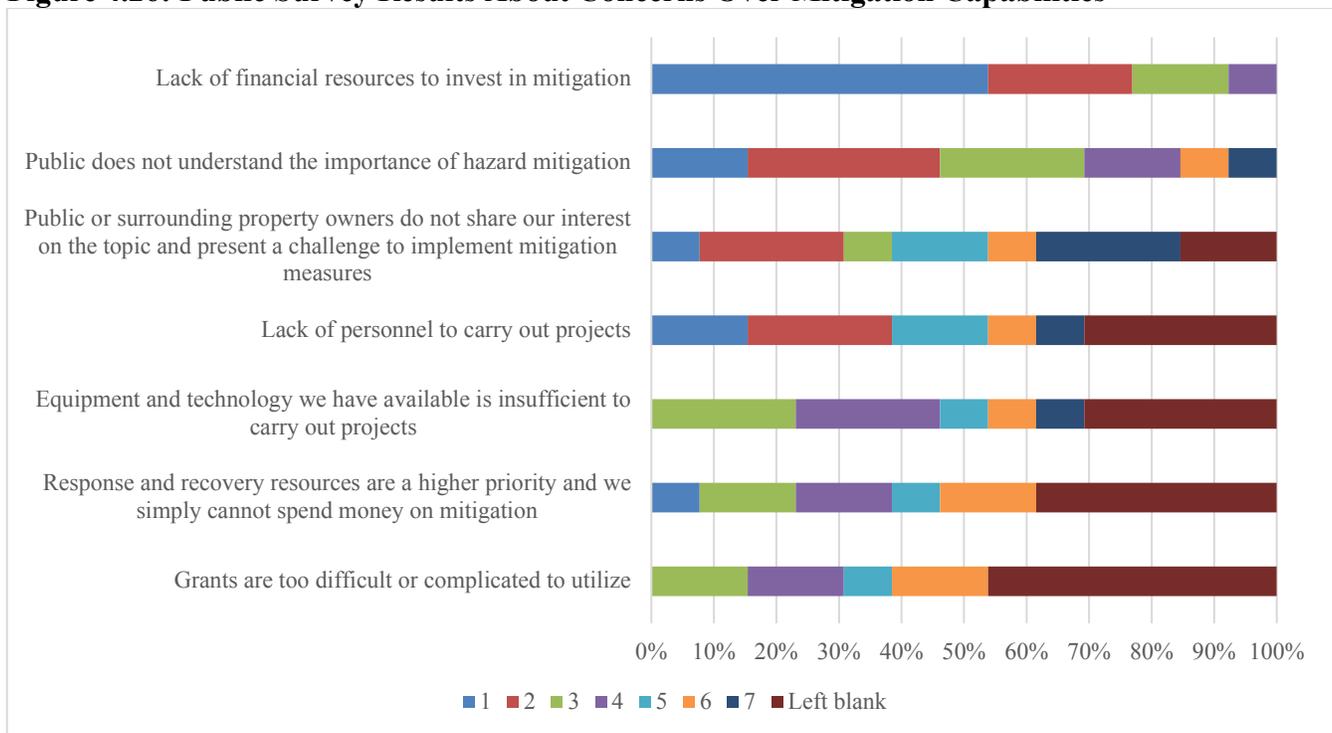
One feature of this plan update is the elimination of many of the “response-oriented” projects from consideration. These are not actually mitigation projects but rather are capabilities that should be met

outside of the mitigation plan. For example, purchasing fire equipment or building an EMS station adds to the capabilities of the jurisdiction to mitigate hazards. Having equipment, training, personnel, and related resources enables the jurisdiction to implement mitigation actions related to certain hazards, particularly fires, human disease incidents, and infrastructure failures. These same resources can be channeled into natural hazard response, recovery, and mitigation. For example, the same fire personnel can be used as storm spotters, public education experts about all hazards, and building inspectors, all of which can prevent hazards and alert the public to threats, as well as emergency response we often imagine. Chapter 2 details many of these kinds of capabilities. This section identifies how these resources are either limited or are available for use in specific applicable mitigation actions.

Public Survey Results – Mitigation Capabilities

A public survey, in which 13 persons responded, asked the following: “Please rank each of the following shortfalls or issues related to capabilities to mitigate hazards (leave blank any that you feel do not apply).” The following shows the results outline the most to the least level of concern of the seven options given.

Figure 4.26: Public Survey Results About Concerns Over Mitigation Capabilities



By far the most considerable concern, not surprisingly, was the lack of financial resources to invest in mitigation. Over half of the respondents considered this concern to be the top or #1 concern. Mismatched concern or appreciation of risks and the need for mitigation issues are also concerns. Several items were not selected at all, giving the impression that they were not concerns for some people, but all issues gained at least 50% affirmation as legitimate concerns. In addition to the specific mitigation actions in the plan, addressing these concerns is also vital as a sustained action throughout the planning area.

The respondents were asked about other capability issues. One stated: “Communication could be a problem as land lines are fewer. With no electricity, communication stops.”

Capabilities for Mitigation By Jurisdiction

Now that a foundation is laid through the discussion of mitigation review categories, the next step is to take these ideas and evaluate specific mitigation actions in light of special jurisdictional characteristics. The

following tables are designed to accomplish this in a brief description. For this assessment, the planning team assumes that mitigation actions that are “complete,” “ongoing,” or “new” but with a statement that they are not relevant to a jurisdiction are not included in this series of tables. Actions that are “new,” “underway,” or “carryover” and otherwise not eliminated are listed in the following tables. In other words, any not sufficiently addressed mitigation action that is relevant for the future of the jurisdiction indicated is evaluated. In the next update, these projects will be re-assessed.

Mitigation Capability Analysis by Action in Rural Clarke County

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered or eliminated from cost-benefit review.

Figure 4.27: Capability Analysis of Mitigation Actions – Rural Clarke County/County Assets

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|--|-----------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Authority to perform in place. | Expensive; there is no compelling need or obvious locations where this is an issue; County identifies modest political will. | Not really | Eliminate |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Authority to perform; capabilities in place in form of conservation officials (County, State, Feds). | Can be expensive; requires investment in private property without a direct County benefit. | Somewhat | Consider |
| Adopt International Building Code and/or International Residential Code. | Authority to perform; low cost; standards are understood; staff in place to administer on a limited scope. | County will focus on public buildings and has limited will to enforce on private property. | Somewhat | Consider |
| Adopt manufactured home development storm shelter ordinances. | Authority to perform; relatively low cost; incentives can encourage implementation; staffing in place to administer. | Requires political will to mandate on existing properties. | Yes; there are rural manufactured home developments. | Consider |
| Adopt/enforce tree trimming ordinances. | Authority to perform; relatively low cost; staffing in place to administer. | Requires political will to mandate on existing properties. | Yes; trees on private properties can affect public areas and infrastructure | Consider |
| Build highway or rail overpasses to reduce intersection accidents. | Authority to perform on secondary road network; strong support by response community. | Can be very expensive and would likely require acquisition of farmland and other private property. | Yes; several teens and young adults have died at rail crossings | Consider |
| Codify restricted access procedures. | Authority to some degree; low costs; staff available to administer. | Can be controversial in some situations; requires sustained law enforcement capabilities, which are limited. | Somewhat | Consider |
| Complete storm water drainage or watershed studies of known flood areas. | Authority to perform; relatively low cost; staff infrastructure is considerable with NRCS, S&WCD, ISU Extension. | Requires engineering expertise; outside of normal County function. | Somewhat; the plan can result in funding and action to reduce erosion, flooding, and other problems. | Consider |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Authority to perform, although eminent domain issues exist; plan and funding mechanism in progress. | Very expensive; land acquisition is a challenge; existing efforts have taken over twenty years. | Yes; a lake project is a major county priority to meet needs of industry even in times of drought. | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; SICOG has assisted with various safe room applications for FEMA funds. | Can be very expensive; requires future maintenance and upkeep. | Yes; especially at places like East Lake campground | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|---|---|-----------|
| Develop/update/publicize local evacuation and shelter-in-place plans. | Authority to perform with some limitations; law enforcement, EMA, and fire can help administer or enforce; low cost. | Enforcing such policies is always a challenge; establishing jurisdiction is a key. | Yes, in specific circumstances | Consider |
| Encourage property owners to own adequate property insurance. | Authority to perform; low cost | Challenge to determine the appropriate entity to perform; limited political will; not consistent with the plan goals/objectives | Somewhat | Eliminate |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Authority to perform; low cost. | Challenge to determine the appropriate entity to perform; limited political will; not consistent with the plan goals/objectives. | Somewhat | Eliminate |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Authority to perform, although ordinances may be required for recalcitrant property owners; law enforcement available. | Can be expensive; administrative staff is limited beyond law enforcement and county attorney; no development or planning staff. | Somewhat | Consider |
| Flood proof critical assets in the community/construct flood protection around assets. | Authority to perform; improves the lifespan of infrastructure; funding available. | Will require evaluation of all rural area and county owned assets, which may be time consuming and expensive. | Yes, at least for bridge approaches | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on County time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Implement all aspects of the NFIP (National Flood Insurance Program). | Authority to perform; relatively low cost; admin staff available with IDNR assistance; already have floodplain ordinance. | Elected leaders have limited political will or expertise to address when there are few occupied properties in floodplains and no clamor to buy flood insurance. | Somewhat; is a requisite action for FEMA funds. | Consider |
| Implement storm water management regulations. | Authority to perform with some limitations; relatively low cost. | Limited technical expertise; limited political will. | Not really; lack of large hard surfaced areas in rural areas. | Eliminate |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Authority to perform; admin and technical staff in place; greatly strong political will. | Very expensive on the scale needed. | Yes | Consider |
| Install air monitors at critical assets and population centers. | Authority to perform; admin staff in place; relatively low cost. | May require additional technical staff; efforts will be needed to identify appropriate locations. | Somewhat; due to low density in most areas, likely to be secondary importance. | Consider |
| Install flood gauges. | Potential authority or partnership (may be a third-party action); low cost; Iowa Flood Center provided admin and technical staff. | Lack of local technical staff. | Somewhat | Consider |
| Install retention and detention structures. | Authority to perform; admin and technical staff in place; | Limited political will; can be expensive. | Not really; lack of large hard surfaced rural public land. | Eliminate |
| Install warning siren(s). | Authority to perform; admin and technical staff in place; moderate cost; aspects already underway. | Depending on number of sirens, it can be expensive; requires continuous maintenance. | Yes, in some areas of exposed populations | Consider |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Maintain sandbags in dry storage. | Authority to perform; admin and technical staff in place; available space for sandbags; low cost for a small quantity. | Requires dry storage; can be expensive to handle the amount needed. | Yes | Consider |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Authority to perform on property owned by county and third parties; admin staff in place. | Unsure where a need exists; can be expensive; limited political will to address on private property. | Potentially, although most structures are likely secured. | Consider |
| Participate in the FEMA Community Rating Service (CRS) program. | Authority to perform; enhances quality of life for those with flood insurance. | Limited political will; limited staffing available to sustain the effort; limited public demand; limited technical expertise. | Not really; too few desire insurance | Eliminate |
| Plan for and carry out efforts to add water supply for fire suppression. | Authority to perform, but limited to public properties. | Can be expensive; is generally addressed by the plan for more water source lakes; limited political will and county jurisdiction over fire protection. | Not really | Eliminate |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | Authority to perform; teams available for local service; LEPC is in place; some political will. | Technical expertise is difficult; reliance on volunteers and a professional team from some distance away from county. | Somewhat | Consider |
| Preserve open spaces in hazard areas. | Authority to perform; impacts quality of life; administrative staff available. | Requires public investment and staffing to maintain property. | Yes | Consider |
| Promote the value of installation of private in-home tornado safe rooms. | Authority to perform; staffing available; low cost. | Approach will need to be decided and sustained. | Yes | Consider |
| Provide safe room education for builders and developers. | Authority to perform; staffing available; low cost. | Approach will need to be decided and sustained. | Yes | Consider |
| Replace/upsized bridges and culverts. | Authority to perform; technical staff available. | High to very high cost; may increase maintenance over the long-term. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | County would not have authority, but REC and others do; decreases future maintenance. | High to very high cost. | Yes | Consider |

For those mitigation actions that are not under direct jurisdiction of the County and its component government agencies, there is a conviction that the County can collaborate effectively with the third-parties involved to accomplish these activities, so they are listed as “consider” actions.

County officials were surveyed about the County’s programs. The County gave generally high marks for its recency of its regulations, ordinances and policies; fire protection and prevention efforts; and the effort to modernize its communications systems. The County gave a neutral rating for the jurisdiction’s enforcement of regulations and ordinances and consistency in following them; the effectiveness of watershed management plans and programs; and ability to stay on top of capital improvements and facility maintenance needs. The County rated above average as to its willingness to implement Firewise, StormReady, NFIP, and the CRS programs, none of which are in use today. During a planning meeting, it was also mentioned the County has a radio committee seeking to improve countywide communications.

County officials were also surveyed about the County’s resources. The County stated the main resource limitation were the lack of financial resources already in the jurisdiction and the lack of staff and consultants to implement actions and manage project. Neutral scores were given for the concern over the lack of staff to apply for and manage grants, lack of political will to carry out challenging projects, and

limited resources to navigate the legal aspects of hazard mitigation. The most positive rating (the least concern) was given for the concern over too many competing interests and too many projects (unable to focus).

Mitigation Capability Analysis by Action in City of Murray

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered or eliminated from cost-benefit review.

Figure 4.28: Capability Analysis of Mitigation Actions – City of Murray

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Authority to perform in most instances; city already has process for acquiring properties. | Can be expensive | Somewhat | Consider |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Authority to perform in most instances; not too expensive. | Technical and admin staff can be a challenge if involving private property; maintenance is an issue. | Somewhat | Consider |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Authority to perform; FEMA funds available as well as technical staff from IDNR. | Local administrative staff limited; can be very expensive; no local policies in place. | Not really; no homes in floodplains | Eliminate |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Authority to perform; is one of the main goals of this plan; low cost; local admin staff available; technical staff available; already on local radar. | Requires revisions and continual updates | Yes | Consider |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Authority to perform; general low upfront cost; technical expertise available to assist the City. | Long-term administration and legal enforcement can be a challenge | Yes | Consider |
| Adopt International Building Code and/or International Residential Code. | Authority to perform; low cost; standards are understood; staff in place to administer on a limited scope. | City will focus on public buildings and has limited will to enforce on private property. | Somewhat | Consider |
| Adopt manufactured home development storm shelter ordinances. | Authority to perform; relatively low cost; incentives can encourage implementation; staffing in place to administer. | Requires political will to mandate on existing properties. | Yes; Murray has many manufactured homes, although no “parks.” | Consider |
| Adopt State fire codes. | Authority is possible; makes sense with the local fire department; admin staff available; low cost | Local technical staff may not be available; requires political will to mandate on existing properties. | Yes | Consider |
| Adopt/enforce tree trimming ordinances. | Authority is shared between City and utility providers; is an important tool for utilities; admin and technical staff available; low cost. | Requires political will to enforce on private properties | Yes | Consider |
| Bridge and culvert improvements and upsizing. | City has no bridges but has several culverts; authority to perform; admin and technical staff available. | Project is expensive; requires hiring of engineer. | Yes | Consider |
| Bury exposed utility and communications infrastructure. | City has limited authority but good collaboration with third parties; would not require direct City staffing. | Project is expensive; current utility company has shown modest interest. | Yes | Consider |
| Clear and deepen ditches on ROWs. | Authority to perform; relatively low cost; can be | Project requires prioritization and hiring of an engineer or | Yes, in some areas of town | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| | part of a bioswale project; admin and technical staff available; city has recent experience. | related professional; future maintenance is a consideration. | | |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Authority to perform on city owned property; would require most admin staffing. | Expensive to very expensive; requires land and long-term maintenance beyond local capacity; requires hiring of engineer. | Not really; town is flat and there are no considerable waterways. | Eliminate |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Authority to perform on city property; modest admin staff needs. | Can be expensive; requires land acquisition or enforcement on private property; requires engineering. | Not really; no major chemical facilities in the city. | Eliminate |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Authority to perform; enhances quality of life; modest admin staff needs; reduces future need for road repairs and inflow into sewers; city has recent experience with project. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; SICOG can assist with FEMA funding; facilitates multiple uses | Expensive to very expensive; requires architect or engineer; requires admin staff to operate and maintain. | Yes | Consider |
| Create a continuity of operations & succession plan for the jurisdiction. | Authority to perform; County already working on this so it would be reasonably simple to pull in Murray; admin staff available; technical expertise available; can improve operations of city. | Requires focused and dedicated staff to stay current with the planning. | Yes | Consider |
| Create and maintain a special needs/oxygen user registration program or inventory. | Authority to perform, although care needed to address HIPPA. | Requires utility and fire department to manage and maintain, and interest is low; little political will. | Somewhat, for emergency response | Eliminate |
| Demolish abandoned properties. | Authority to perform; admin staff in place; technical expertise available (city admin had a successful process in Leon, Iowa). | Can be expensive; requires consistent enforcement of ordinances and political will to continue through process. | Yes | Consider |
| Develop a vegetation management plan. | Authority to perform; technical resources available; relatively low cost; electric utility may be a key partner. | Requires consistent effort and administrative staffing; may require enforcement. | Yes | Consider |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Authority to perform; modest admin staff needs; reduces future need for road repairs; city has recent experience with project; city maintenance staff available. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Employ construction measures that direct water away from structures. | Authority to perform; reduces maintenance costs; can be low cost when included as part of new construction. | Requires architect or engineer; can be expensive if existing buildings are retrofitted. | Yes; extends life of buildings | Consider |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Authority to perform; fire dept provides staffing and technical resources; simple education program is low cost; grants possible. | Actual incentive program is more expensive, especially if involving free supplies, installation, and inspections; requires sustained effort of volunteers. | Yes, but only with sustained effort and good incentive. | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|---|--|---------------|
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | Authority to perform; admin and technical resources available; low cost; can result in design that improves quality of life. | Requires updating of city code and technical expertise to draft ordinance. | Somewhat, if new development is likely. | Consider |
| Encourage property owners to own adequate property insurance. | Authority to perform; admin staff available on countywide level; can partner with insurance providers for technical needs; low cost. | Requires long-term sustained effort; not directly related to plan goals/objectives chosen by planning team. | Yes, but indirectly; affects private property investment | Consider |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Authority to perform; low cost; admin staff available. | Enforcement may be a challenge without technical staff; requires ordinance update; not consistent with the plan goals/objectives. | Somewhat, on fringes of city | Consider |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers; city has recent experience with project; grant programs available. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Enforce burning restrictions. | Authority is likely with the County, but local fire department would enforce; low cost; technical resources available. | Admin would require volunteers of fire department to enforce; requires sustained effort. | Somewhat | Consider |
| Enforce multi-family housing extinguisher laws. | Authority is likely with State, but local fire department would likely enforce; admin and technical staff available but volunteers; likely low cost. | Requires sustained effort and likely State involvement if enforcement necessary. | Somewhat; there are few multi-family units. | Consider |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Authority to perform; likely low cost; can improve quality of life | Technical and admin staff and resources likely outside of the city; requires sustained action. | Somewhat; necessary to identify the specific populations and how they are not already reached. | Consider |
| Establish neighborhood watch programs for vulnerable populations. | Authority to perform; likely low cost; CERT team is established. | No city police presence; requires reliance on Sheriff to support; requires local administration and sustained effort. | Somewhat; although unsure of the scope of problems | Consider |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Authority to perform; city nuisance and related ordinances in place; staffing in place; legal representation; strong or growing political will. | Some resistance to investment of public dollars; can be expensive if public has to clean property | Yes; need exceeds funds available | Consider |
| Flood proof critical assets in the community/construct flood protection around assets. | Authority to perform; improves the lifespan of infrastructure; funding available. | Requires evaluation to determine what assets need protection the most; may require an engineer. | Somewhat; depending on what needs are identified through investigation | Consider |
| Fund weatherization programs to more low-income households. | Authority to perform; city has experience through a current rehab program; staffing available; grants available. | Funding a project without grant funds would be expensive. | Yes, given the age and condition of many homes in the city. | Consider |
| Harden public buildings and utilities (structural retrofits) | Authority to perform, although some utility infrastructure is non-City; admin staff in place. | Can be very expensive and may not make sense for some of the older buildings; requires engineering and other technical expertise. | Yes | Consider |
| Hold annual meetings in each jurisdiction to review plan | Authority to perform; increases support and | Sometimes limited political will when there are many | Yes, a requisite action that makes the plan more relevant and | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|--|---|---|---------------|
| progress and prepare a strategy for the coming fiscal year. | awareness; low cost; can help save money. | other demands on City time and funding. | moves projects forward. | |
| Implement storm water management regulations. | Authority to perform; City has taken step in this direction with creation of storm water utility; admin staff in place. | Technical staff may be needed; requires political will to enforce regulations on private property. | Yes, as water ponds on property and damages neighborhoods | Consider |
| Implement stream modifications/channel improvements and stream bank stabilization. | Authority to perform, with some role also by IDNR and other agencies; admin staff and technical services provided by other entities. | Can be expensive; would require IDNR and federal approval in some cases; may require acquisition of private property or easements. | Somewhat | Eliminate |
| Improve storm water drainage system capacity. | This measure is addressed by others. | - | - | Eliminate |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Authority to perform; admin staff in place; strong political will and within goals of the City. | Very expensive on the scale needed; engineer is needed for technical aspects. | Yes | Consider |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Authority to perform; admin staff in place; groups like SICOG available to prepare plans; relatively low cost. | Requires outside planning expertise; modest political will given the limited likelihood of significant development. | Yes | Consider |
| Install access barriers around certain chemical tanks. | Authority to perform only on City property; may reduce insurance and law enforcement costs; | Requires evaluation to determine what assets need protection the most; may require an engineer; requires enforcement on private property. | Somewhat, but needs are limited in Murray | Eliminate |
| Install and/update anti-virus software and emergency communications technology. | Authority to perform; relatively low cost; can save lots of funds in repairs due to damage from cyber-attack; resources available. | Requires vigilance and some upfront and ongoing investment; may require outside IT assistance. | Yes | Consider |
| Install hazard signs in area campgrounds, parks, and open spaces. | Authority to perform; low cost; admin and technical resources in place. | Requires maintenance and understanding of what signs would need to read. | Somewhat | Consider |
| Install highway guardrails to keep vehicles on roadway. | Authority to perform on public property only; county provides some level of technical assistance. | Requires maintenance and engineer to provide technical assistance; expensive. | Not really; no major highways at highway speeds | Eliminate |
| Install quick-connect emergency generator hook-ups for facilities. | Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, for any community building used as a shelter or gathering place or housing critical data | Consider |
| Install retention and detention structures. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers; grant programs available. | Expensive; requires available land; requires hiring of engineer; requires ongoing maintenance. | Yes, in specific areas to be identified | Consider |
| Install sprinkler systems in public buildings. | Authority to perform; modest admin staff needs. | Expensive; requires engineering design and ongoing maintenance as well as adequate water pressure. | Not really, given city of public buildings in Murray | Eliminate |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Authority to perform; modest admin and technical requirements; modest to moderate cost. | Maintenance is a challenge for either type. | Not really, at least not on a large scale that necessitates public investment. | Eliminate |
| Institute alternative bus routes and plans for road closures. | No direct authority for the City; low cost; admin staff available. | School would address this and collaborate with the city. | Yes, but not for the City. | Eliminate |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|---|--|---|-----------|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Maintain trees proactively on public property and ROW areas. | Authority in place, although primarily a responsibility of the utility provider; reduces city costs for infrastructure maintenance. | Can be expensive if there are large numbers of trees; lack of admin and technical resources at the city level. | Yes, with consistent sustained effort. | Consider |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Authority to perform on property owned by city and third parties. | Unsure where a need exists; can be expensive; limited political will to address on private property; lacking local city staffing. | Potentially, although most structures are likely secured. | Consider |
| Post “no dumping” signs. | Authority to perform; low cost. | Difficult to enforce. | Somewhat | Consider |
| Preserve open spaces in hazard areas. | Authority to perform on public property. | Can be expensive and a challenge to maintain | Yes, in very specific circumstances | Consider |
| Promote the value of installation of private in-home tornado safe rooms. | Authority to perform; admin staff available; third party technical support available; low cost. | Requires sustained effort to make real difference; may require an ordinance or incentive program. | Yes | Consider |
| Provide safe room education for builders and developers. | Authority to perform; technical staff on a county or regional level; low cost. | Requires technical services outside of the city; does not really make sense for the City to lead this effort. | Potentially, but on a regional level | Eliminate |
| Purchase road closure barricades. | Authority to perform; relatively low cost, given the number needed; staffing and resources adequate. | Requires place of storage. | Yes | Consider |
| Purchase stand-by portable pumps and generators. | Authority to perform; relatively low cost; staffing and resources adequate. | Requires place of storage and fuel; requires training for operator. | Yes, if vulnerable public buildings need emergency power. | Consider |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | Authority to perform; county staffing and resources available; as part of a key county strategy. | Expensive; few local technical resources; would not be a City effort, as City resources and political will to invest is modest | Yes | Consider |
| Purchase/install backup fixed power generators and pumps. | Authority to perform; staffing and resources adequate. | Requires testing, maintenance, and fuel; requires training for operator. Requires administrative enforcement effort; probably does not make sense until zoning and subdivision regulations are passed. | Yes, if one or more often occupied public buildings need power. | Consider |
| Require burial of utility lines in new development. | Authority to perform; low cost; technical staff available. | Requires administrative enforcement effort; probably does not make sense until zoning and subdivision regulations are passed. | Potentially, although development potential is modest. | Consider |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Authority to perform; low cost; technical staff available on a regional/State scale. | Requires administrative enforcement effort; probably does not make sense until zoning and subdivision regulations are passed. | Potentially, although development potential is modest. | Consider |
| Store digital and hard copies of public records in low-risk, offsite locations. | Authority to perform; relatively low cost; admin staff available. | Requires an adopted policy and enhanced records maintenance effort. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | City would not have authority, but Alliant Energy does; decreases future maintenance. | High to very high cost. | Yes | Consider |

For those mitigation actions that are not under direct jurisdiction of the City and its component government agencies, there is a conviction that the City can collaborate effectively with the third-parties involved to accomplish these activities, so they are listed as “consider” actions.

City officials were surveyed about the City’s programs. The City gave generally high marks for its enforcement of regulations and ordinances and consistency in following them and for its ability to stay on top of capital improvements and facility maintenance needs rather than be reactive. The City gave a neutral rating for the jurisdiction’s quality and recency of regulations, ordinances, and policies; the community’s fire protection outreach and information to the public; the jurisdiction’s communications equipment and systems; the effectiveness of watershed management plans and programs; and its effectiveness in managing disaster debris. The City rated “average” as to its willingness to implement Firewise, StormReady, NFIP, and the CRS programs, none of which are in use today.

City officials were also surveyed about the City’s resources. The City stated the main resource limitation were the lack of financial resources already in the jurisdiction and the lack of political will to make tough decisions necessary to carry out long-term, controversial, or complicated projects. Neutral scores were given for the concern over the lack of staff to apply for and manage grants, lack of staff or consultants to implement actions and manage projects, limited resources to navigate the legal aspects of hazard mitigation, and too many competing interests or too many projects (unable to focus).

Mitigation Capability Analysis by Action in City of Osceola

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered or eliminated from cost-benefit review.

Figure 4.29: Capability Analysis of Mitigation Actions – City of Osceola

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Authority to perform in most instances; city already has process for acquiring properties. | Can be expensive | Somewhat | Consider |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | Authority to perform in most instances; not too expensive. | Technical and admin staff can be a challenge if involving private property; maintenance is an issue. | Somewhat | Consider |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Authority to perform; FEMA funds available as well as technical staff from IDNR; can improve quality of life. | Local administrative staff limited; can be very expensive; no local policies in place. | Not really; no homes in floodplains | Eliminate |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Authority to perform; is one of the main goals of this plan; low cost; local admin staff available; technical staff available; already on local radar. | Requires revisions and continual updates. | Yes | Consider |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Authority to perform; general low upfront cost; technical expertise available to assist the City. | Long-term administration and legal enforcement can be a challenge. | Yes | Consider |
| Adopt manufactured home development storm shelter ordinances. | Authority to perform; relatively low cost; incentives can encourage implementation; staffing in place to administer. | Requires political will to mandate on existing properties. | Yes; Osceola has several manufactured home areas. | Consider |
| Bridge and culvert improvements and upsizing. | Authority to perform; admin and technical staff available. | Project is expensive; requires hiring of engineer. | Yes | Consider |
| Build highway or rail overpasses to reduce intersection accidents. | Authority to perform in most cases; admin staff available; IDOT assistance possible. | Technical staff would be needed from outside of community; very expensive. | Not really; traffic levels do not justify in most situations. | Eliminate |
| Bury exposed utility and communications infrastructure. | City has limited authority but good collaboration with | Project is expensive; current utility company has shown | Yes | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|--|--|-----------|
| | third parties; would not require direct City staffing; can improve quality of life. | very little interest on a wide scale. | | |
| Codify restricted access procedures. | Authority to some degree; low costs; staff available to administer. | Can be controversial in some situations; requires sustained law enforcement capabilities, which are limited. | Somewhat | Consider |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers; city now working on a project of this nature. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; with dual use; SICOG can assist with FEMA funding | Expensive to very expensive; requires architect or engineer; requires admin staff to operate and maintain. | Yes | Consider |
| Create and maintain a special needs/oxygen user registration program or inventory. | Authority to perform, although care needed to address HIPPA; can improve quality of life. | Requires utility and fire department to manage and maintain. | Somewhat, for emergency response | Consider |
| Develop/update/publicize local evacuation and shelter-in-place plans. | Authority to perform with some limitations; law enforcement, EMA, and fire can help administer or enforce; low cost. | Enforcing such policies is always a challenge; establishing jurisdiction is a key. | Yes, in specific circumstances | Consider |
| Encourage property owners to own adequate property insurance. | Authority to perform; admin staff available on countywide level; can partner with insurance providers for technical needs; low cost | Requires long-term sustained effort; not directly related to plan goals/objectives chosen by planning team. | Yes, but indirectly; affects private property investment | Consider |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Authority to perform; low cost; admin staff available. | Enforcement may be a challenge without technical staff; requires ordinance update; not consistent with the plan goals/objectives; no political will. | Somewhat, on fringes of city | Eliminate |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers; city has underway experience with project; grant programs available. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Authority to perform; likely low cost. | Technical and admin staff and resources likely outside of the city; requires sustained action. | Somewhat; necessary to identify the specific populations and how they are not already reached. | Consider |
| Facilitate the cleanup of abandoned properties, unused chemical storage, and other potential environmental hazards. | Authority to perform; city nuisance and related ordinances in place; staffing in place; legal representation; strong or growing political will. | Some resistance to investment of public dollars; can be expensive if public has to clean property | Yes; need exceeds funds available | Consider |
| Flood proof critical assets in the community/construct flood protection around assets. | Authority to perform; improves the lifespan of infrastructure; funding available. | Requires evaluation to determine what assets need protection the most; may require an engineer. | Somewhat; depending on what needs are identified through investigation | Consider |
| Fund weatherization programs to more low-income households. | Authority to perform; city has experience through a current rehab program; staffing available; grants available. | Funding a project without grant funds would be expensive. | Yes, given the age and condition of many homes in the city. | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|---|---|-----------|
| Harden public buildings and utilities (structural retrofits) | Authority to perform, although some utility infrastructure is non-City; admin staff in place. | Can be very expensive and may not make sense for some of the older buildings; requires engineering and other technical expertise. | Yes | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on City time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Implement all aspects of the NFIP (National Flood Insurance Program). | Authority to perform; relatively low cost; admin staff available with IDNR assistance. | Elected leaders have limited political will or expertise to address when there are few occupied properties in floodplains and no clamor to buy flood insurance. | Somewhat; is a requisite action for FEMA funds. | Consider |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | Authority to perform; admin staff in place; technical staff available; part of ongoing capital improvement program; extends life of infrastructure; grants available. | Expensive; requires extensive engineering; local resources limited. | Yes, where deteriorated mains remain. | Consider |
| Implement storm water management regulations. | Authority to perform in most instances; admin staff available; moderate political will. | Technical staff would need to be resourced; may require engineering support. | Yes, in some areas of the city. | Consider |
| Implement stream modifications/channel improvements and stream bank stabilization. | Authority to perform, with some role also by IDNR and other agencies; admin staff and technical services provided by other entities. | Can be expensive; would require IDNR and federal approval in some cases; may require acquisition of private property or easements. | Yes, on fringes of city and near ponds | Consider |
| Install air monitors at critical assets and population centers. | Authority to perform; low cost; admin staff available. | Technical staff may need to be resourced. | Yes, at specific to be identified locations | Consider |
| Install flood gauges. | Potential authority or partnership (may be a third-party action); low cost; Iowa Flood Center has way of administering and technical staff. | Lack of local technical staff. | Not really within the city boundaries | Eliminate |
| Install hazard signs in area campgrounds, parks, and open spaces. | Authority to perform; low cost; admin staffing needs are minimal; technical staff available. | Unsure what the signs would address in the park system, so that issue must be discovered. | Somewhat | Consider |
| Install quick-connect emergency generator hook-ups for facilities. | Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, for any community building used as a shelter or gathering place or housing critical data | Consider |
| Install sprinkler systems in public buildings. | Authority to perform; modest admin staff needs. | Expensive; requires engineering design and ongoing maintenance as well as adequate water pressure. | Yes, for a few buildings in downtown area | Consider |
| Install warning siren(s). | Authority to perform; technical and admin staff available; moderate cost; grants available. | Sirens require maintenance and operational upgrades. | Yes | Consider |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Authority to perform; modest admin and technical requirements; modest to moderate cost. | Maintenance is a challenge for either type; no strong political will within the City. | Not really, at least not on a large scale that necessitates public investment. | Eliminate |
| Institute alternative bus routes and plans for road closures. | No direct authority for the City; low cost; admin staff available. | School would address this and collaborate with the city. | Yes, but not for the City. | Eliminate |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Maintain sandbags in dry storage. | Authority to perform; admin and technical staff in place; available space for sandbags; low cost for a small quantity. | Requires dry storage; can be expensive to handle the amount needed. | Yes | Consider |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | Authority to perform on property owned by city and third parties. | Unsure where a need exists; can be expensive; limited political will to address on private property; lacking local city staffing. | Potentially, although most structures are likely secured. | Eliminate |
| Participate in the FEMA Community Rating Service (CRS) program. | Authority to perform; enhances quality of life for those with flood insurance. | Limited political will and public demand; limited staffing available to sustain the effort; limited technical expertise. | Not really; too few desire insurance | Eliminate |
| Plan for and carry out efforts to add water supply for fire suppression. | Authority to perform, but limited to public properties. | Can be expensive; is generally addressed by the plan for more water source lakes; limited political will and county jurisdiction over fire protection. | Not really | Eliminate |
| Preserve open spaces in hazard areas. | Authority to perform; administrative staff available. | Requires public investment and staffing to maintain property. | Yes | Consider |
| Promote the value of installation of private in-home tornado safe rooms. | Authority to perform; staffing available; low cost. | Approach will need to be decided and sustained. | Yes | Consider |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Authority to perform; admin and technical staff available; low cost. | Requires partnership with utility providers to be most effective; requires sustainable effort. | Yes, with sustained effort. | Consider |
| Provide safe room education for builders and developers. | Authority to perform; technical staff on a county or regional level; low cost. | Requires technical services outside of the city; City would not lead the effort but would be involved. | Potentially, but on a regional level, with local support. | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | City has limited authority, but Alliant Energy does; decreases future maintenance. | High to very high cost. | Yes | Consider |

For those mitigation actions that are not under direct jurisdiction of the City and its component government agencies, there is a conviction that the City can collaborate effectively with the third-parties involved to accomplish these activities, so they are listed as “consider” actions.

City officials were surveyed about the City’s programs. The City gave generally the best marks for its community’s fire protection outreach and information to the public and the jurisdiction’s communications equipment and systems. Moderate marks were given for its ability to stay on top of capital improvements and facility maintenance needs rather than be reactive, it’s effectiveness in managing disaster debris, and watershed planning effectiveness. Moderate to low ratings were given to enforcement of regulations and ordinances and consistency in following them and for the jurisdiction’s quality and recency of regulations, ordinances, and policies. The City rated “below average” as to its willingness to implement Firewise, StormReady, NFIP, and the CRS programs, none of which are in use today.

City officials were also surveyed about the City’s resources. The City stated the most significant resource limitation was the lack of political will to make tough decisions necessary to carry out long-term,

controversial, or complicated projects. Close behind were the lack of financial resources already in the jurisdiction and limited resources to navigate the legal aspects of hazard mitigation. Neutral scores were given for the concern over the lack of staff to apply for and manage grants, lack of staff or consultants to implement actions and manage projects. The City was not concerned about too many competing interests or too many projects (unable to focus).

The City was asked about its capabilities concerns that need the most focus. The City stated that “water supply has been and continues to be one of the greatest risks. However, storm water control is becoming a problem as rain events increase in severity and overflow existing systems.”

Mitigation Capability Analysis by Action in City of Woodburn

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered or eliminated from cost-benefit review.

Figure 4.30: Capability Analysis of Mitigation Actions – City of Woodburn

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Authority to perform in most instances; city already has process for acquiring properties. | Can be expensive | Somewhat | Consider |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Authority to perform; FEMA funds available as well as technical staff from IDNR; FEMA maps and NFIP already in place. | Local administrative staff limited; can be very expensive. | Potentially; some properties at least partially in floodplain | Consider |
| Adopt a continuity of operations & succession plan for the jurisdiction. | Authority to perform; is one of the main goals of this plan; low cost; local admin staff available; technical staff available; already on local radar. | Requires revisions and continual updates | Yes | Consider |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Authority to perform; general low upfront cost; technical expertise available to assist the City. | Long-term administration and legal enforcement can be a challenge; some codes, such as zoning, may not make sense. | Yes | Consider |
| Adopt International Building Code and/or International Residential Code. | Authority to perform; low cost; standards are understood. | City will focus on public buildings and has limited will to enforce on private property; no local technical expertise. | Not really; new development is very unlikely. | Eliminate |
| Adopt State fire codes. | Authority is possible, but City may not be the most direct jurisdiction; makes sense with the local fire department; admin staff available; low cost | Local technical staff may not be available; requires political will to mandate on existing properties. | Yes | Consider |
| Adopt/enforce tree trimming ordinances. | Authority is shared between City and utility providers; is an important tool for utilities; admin and technical staff available; low cost. | Requires political will to enforce on private properties | Yes | Consider |
| Bridge and culvert improvements and upsizing. | Authority to perform; admin and technical staff available. | Project is expensive; requires hiring of engineer. | Yes | Consider |
| Bury exposed utility and communications infrastructure. | City has limited authority but good collaboration with third parties; would not require direct City staffing. | Project is expensive; current utility company has shown modest interest. | Yes | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|--|-----------|
| Clear and deepen ditches on ROWs. | Authority to perform; relatively low cost; can be part of a bioswale project; admin and technical staff available to the city. | Project requires prioritization and hiring of an engineer or related professional; future maintenance is a consideration. | Yes, in some areas of town | Consider |
| Complete storm water drainage or watershed studies of known flood areas. | Authority to perform; county/regional staff and technical support available; relatively low cost; grants available. | While city would be involved, work would be led by other entities. | Yes, given topography of the community | Consider |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Authority to perform on city owned property; part of long-term county goal; grant funds available for things like farm ponds. | Expensive for any significant water body; requires land and long-term maintenance beyond local capacity; requires hiring of engineer for large project. | Yes, west and upstream from the city | Consider |
| Construct storage facilities for pesticides, insecticides, and chemicals. | Authority to perform on city property; modest admin staff needs. | Can be expensive; requires land acquisition or enforcement on private property; requires engineering. | Not really; no major chemical facilities in the city. | Eliminate |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; with dual use, enhances quality of life; SICOG can assist with FEMA funding | Expensive to very expensive; requires architect or engineer; requires admin staff to operate and maintain. | Yes | Consider |
| Create and maintain a special needs/oxygen user registration program or inventory. | Authority to perform, although care needed to address HIPPA. | Requires utility and fire department to manage and maintain; moderate political will. | Somewhat, for emergency response | Consider |
| Demolish abandoned properties. | Authority to perform; admin staff in place. | Can be expensive; requires consistent enforcement of ordinances and political will to continue through process; City lacks technical resources. | Yes | Consider |
| Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | Authority to perform; City has joined; reduces future losses; technical resources available; FEMA priority; low cost. | Local administration resources are limited. | Yes | Consider |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Authority to perform; modest admin staff needs; reduces future need for road repairs; city has recent experience with project; city maintenance staff available. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | Authority to perform; fire dept provides staffing and technical resources; simple education program is low cost; grants possible. | Actual incentive program is more expensive, especially if involving free supplies, installation, and inspections; requires sustained effort of volunteers. | Yes, but only with sustained effort and good incentive. | Consider |
| Encourage property owners to install sewer system backflow devises. | Authority to perform; collaboration with sewer provider; low cost. | Limited staffing and technical resources to enforce. | Yes | Consider |
| Encourage property owners to own adequate property insurance. | Authority to perform; admin staff available on countywide level; can partner with insurance providers for technical needs; low cost. | Requires long-term sustained effort; not directly related to plan goals/objectives chosen by planning team. | Yes, but indirectly; affects private property investment | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|--|---|--|-----------|
| Encourage the implementation of water-saving measures, including soil and water conservation practices. | Authority to perform; technical and admin resources on county/regional level; low cost. | Measures that make an impact would be more expensive; little local political will. | Not really; pertains mostly to farmland | Eliminate |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | Authority to perform; low cost; admin staff available. | Enforcement may be a challenge without technical staff; requires ordinance update; little political will. | Not really; development potential is very low. | Eliminate |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | Authority to perform; modest admin staff needs; reduces future need for road repairs and inflow into sewers; grant programs available. | Expensive to very expensive and will require priorities and a phased approach; requires hiring of engineer; requires ongoing maintenance. | Yes | Consider |
| Establish alert systems and specific outreach efforts for vulnerable populations. | Authority to perform; likely low cost; can improve quality of life | Technical and admin staff and resources likely outside of the city; requires sustained action. | Somewhat; necessary to identify the specific populations and how they are not already reached. | Consider |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | Authority to perform; city nuisance and related ordinances in place; legal representation; strong or growing political will. | Some resistance to investment of public dollars; can be expensive if public has to clean property; lack of admin and tech resources. | Yes; need exceeds funds available | Consider |
| Flood proof critical assets in the community/construct flood protection around assets. | Authority to perform; improves the lifespan of infrastructure; funding available. | Requires evaluation to determine what assets need protection the most; may require an engineer. | Somewhat; depending on what needs are identified through investigation | Consider |
| Fund <i>weatherization</i> programs to more low-income households. | Authority to perform; staffing available regionally; grants available. | Funding a project without grant funds would be expensive. | Yes, given the age and condition of many homes in the city. | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on County time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Implement storm water management regulations. | Authority to perform; relatively low upfront cost. | Technical and staff not available locally; requires political will to enforce regulations on private property. | Yes, due to topography | Eliminate |
| Implement stream modifications/channel improvements and stream bank stabilization. | Authority to perform, with some role also by IDNR and other agencies; admin staff and technical services provided by other entities. | Can be expensive; would require IDNR and federal approval in some cases; may require acquisition of private property or easements. | Yes | Consider |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). Install sidewalks. | Authority to perform; admin staff in place; strong political will and within goals of the City. | Very expensive on the scale needed; engineer is needed for technical aspects. | Yes | Consider |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | Authority to perform; admin staff in place; groups like SICOG available to prepare plans; relatively low cost. | Requires outside planning expertise; modest political will given the limited likelihood of significant development. | Not really; development is unlikely | Eliminate |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. – <i>Focus on cellular and Internet capabilities.</i> | Authority in place, but limited responsibility; staff provided by third party providers. | Requires political will of third-party providers; can be very expensive. | Yes; City indicates low or inconsistent water pressure | Consider |
| Install flood gauges. | Potential authority or partnership (may be a third-party action); low cost; Iowa | Lack of local technical staff. | Somewhat | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|--|---|-----------|
| Install quick-connect emergency generator hook-ups for facilities. | Flood Center has admin and technical staff. Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, for any community building used as a shelter or gathering place or housing critical data | Consider |
| Install warning siren(s). | Authority to perform; admin costs are low; technical needs are low; relatively low cost. | Requires maintenance and trained operators. | Yes | Consider |
| Install windbreaks (permanent and seasonal). Use snow fences or “living snow fences” (e.g. rows of trees or other vegetation) to limit wind effects. | Authority to perform; modest admin and technical requirements; modest to moderate cost. | Maintenance is a challenge for either type. | Not really, at least not on a large scale that necessitates public investment. | Eliminate |
| Institute alternative bus routes and plans for road closures. | No direct authority for the City; low cost; admin staff available. | School would address this and collaborate with the city. | Yes, but not for the City. | Eliminate |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Maintain sandbags in dry storage. | Authority in place; limited technical and admin staff requirements; relatively low cost. | Requires storage location. | Somewhat | Consider |
| Participate in the FEMA Community Rating Service (CRS) program. | Authority in place; already participating in NFIP; regional resources available; political interest, if not will. | Requires sustained effort and expanded admin and technical resources, as this is a new effort in region; unsure of costs involved. | Somewhat | Consider |
| Plan for and carry out efforts to add water supply for fire suppression. | Authority in place, but limited responsibility; staff provided by third party providers. | Requires political will of third-party providers; can be very expensive. | Yes; water pressure is low or inconsistent | Consider |
| Post “no dumping” signs. | Authority to perform; low cost. | Difficult to enforce. | Somewhat | Consider |
| Preserve open spaces in hazard areas. | Authority to perform on public property; can enhance quality of life | Can be expensive and a challenge to maintain; no local staffing resources. | Yes, in very specific circumstances | Eliminate |
| Promote the value of installation of private in-home tornado safe rooms. | Authority to perform; admin staff available; third party technical support available; low cost. | Requires sustained effort to make real difference; may require an ordinance or incentive program. | Yes | Consider |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | Authority to perform; technical staff to set up the process is available regionally; moderate political will; low cost. | Requires sustained effort and admin staff; may require an ordinance or incentive program. | Yes | Consider |
| Provide safe room education for builders and developers. | Authority to perform; technical staff on a county or regional level; low cost. | Requires technical services outside of the city; does not really make sense for the City to lead this effort. | Potentially, but on a regional level | Eliminate |
| Purchase road closure barricades. | Authority to perform; relatively low cost, given the number needed; staffing and resources adequate. | Requires place of storage. | Yes | Consider |
| Purchase snow trucks, plows, sanders. | Authority to perform; staffing in place to purchase and use equipment; grants available to help purchase. | Requires place of storage; requires maintenance and upkeep; expensive to purchase. | Yes, but may make more sense to contract with County for snow removal | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|-----------|
| Purchase stand-by portable pumps and generators. | Authority to perform; relatively low cost; staffing and resources adequate. | Requires place of storage and fuel; requires training for operator. | Yes, if vulnerable public buildings need emergency power. | Consider |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment/systems. | Authority to perform; county staffing and resources available; as part of a key county strategy. | Expensive; few local technical resources; would not be a City effort, as City resources and political will to invest is modest | Yes | Consider |
| Require burial of utility lines in new development. | Authority to perform; low cost; technical staff available regionally. | Requires administrative enforcement effort; probably does not make sense until zoning and subdivision regulations are passed. | Potentially, although development potential is very low. | Eliminate |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | Authority to perform; low cost; technical staff available on a regional/State scale. | Requires administrative enforcement effort; probably does not make sense until zoning and subdivision regulations are passed. | Potentially, although development potential is very low. | Eliminate |
| Store digital and hard copies of public records in low-risk, offsite locations. | Authority to perform; relatively low cost; admin staff available. | Requires an adopted policy and enhanced records maintenance effort. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | City would not have authority, but Alliant Energy does; decreases future maintenance. | High to very high cost. | Yes | Consider |

Most of the City’s infrastructure, services, programs, and policies are the responsibility of third-parties. For example, the City does not perform its own water, sewer, gas, or electric service. It also does not have such policies as nuisance regulations, zoning, or tree and vegetation management. It participates in the NFIP but does not play an active role. Some actions are not relevant because development in the city is very unlikely and the City does not have regulation tools to address possible development.

City officials were surveyed about the City’s programs. Officials gave low marks for its use of programs, such as enforcement of regulations, quality and recency of regulations, fire department outreach and educational efforts, level of modernization of communications equipment and systems, watershed management effectiveness, debris management effectiveness, and ability to stay on top of capital improvements needs. The City rated “above average” as to its willingness to implement Firewise and NFIP and “below average” for participation in the CRS program.

City officials were also surveyed about the City’s resources. The officials stated that almost all options listed for resource limitations are major issues in Woodburn. These include the lack of financial resources already in the jurisdiction, the lack of staff to apply for and manage grants, lack of staff or consultants to implement actions and manage projects, limited resources to navigate the legal aspects of hazard mitigation, and too many competing interests or too many projects (unable to focus). A more moderate rating was given to the concern over the lack of political will to make tough decisions necessary to carry out long-term, controversial, or complicated projects.

A city council member stated frankly: “Woodburn is in need of equipment and resources to help our town.”

Mitigation Capability Analysis by Action in Clarke School District

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered in cost-benefit review or should be eliminated from further review.

Figure 4.31: Capability Analysis of Mitigation Actions – Clarke School District

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|--|--|---|----------|
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Authority to perform; staff and technical resources in place; low cost. | Need to understand what needs to be updated and school vs other local governments are involved. | Somewhat | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; State and FEMA priority; grant funding available; regional and state resources available. | Very expensive; requires maintenance and sustained operations. | Yes | Consider |
| Harden public buildings and utilities (structural retrofits) | Authority to perform; grant funding potentially available; regional and state resources available. | Very expensive; requires maintenance. | Yes | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on District time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Install hazard signs in area campgrounds, parks, and open spaces. | Authority to perform; local staffing available; low cost. | Requires awareness of needs and maintenance of signage. | Yes, makes sense for outdoor sports facilities. | Consider |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Purchase stand-by portable pumps and generators. | Authority in place; modest admin staff needs; technical staff available; modest cost. | Requires maintenance and fuel; requires use plan; political will seems modest. | Yes, when the facility is used for emergency sheltering | Consider |
| Purchase/install backup fixed power generators and pumps. | Authority in place; modest admin staff needs; technical staff available. | Can be expensive; requires maintenance and fuel; political will seems modest. | Yes | Consider |
| Store digital and hard copies of public records in low-risk, offsite locations. | Authority to perform; relatively low cost; admin staff available. | Requires an adopted policy and enhanced records maintenance effort. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | School partners with Alliant Energy for performance on District property; decreases future maintenance. | High to very high cost. | Yes | Consider |

For those mitigation actions that are not under direct jurisdiction of the District, there is a conviction that the School Board can collaborate effectively with the third-parties involved to accomplish these activities, so they are listed as “consider” actions.

District officials were surveyed about the District’s programs. The school staff gave generally high marks for its enforcement of regulations and ordinances and consistency in following them; the jurisdiction’s quality and recency of regulations, ordinances, and policies; the community’s fire protection outreach and information to the public; and its ability to stay on top of capital improvements and facility maintenance needs rather than be reactive. The District gave a neutral rating for the jurisdiction’s effectiveness of watershed management plans and programs and its effectiveness in managing disaster debris. The District gave a relatively poor rating to its communications equipment and systems. The District rated “above average” as to its willingness to implement Firewise and StormReady, none of which are in use today. NFIP and CRS are not relevant to the district campus.

District officials were also surveyed about the District’s resources. The staff stated the main resource limitations were the lack of staff to apply for and manage grants and lack of staff or consultants to implement actions and manage projects. Neutral scores were given for the concern over the lack of financial resources already in the jurisdiction and the limited resources to navigate the legal aspects of

hazard mitigation. Overall positive ratings were given to the ability of the District to address the lack of political will to make tough decisions necessary to carry out long-term, controversial, or complicated projects and too many competing interests or too many projects (unable to focus).

Mitigation Capability Analysis by Action in Murray School District

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered in cost-benefit review or should be eliminated from further review.

Figure 4.32: Capability Analysis of Mitigation Actions – Murray School District

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|--|--|-----------|
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | Authority to perform; generally low cost; staff available to implement; technical resources available. | Leadership needs to understand specific needs and issues. | Somewhat | Consider |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; staff available to operate and maintain; grant dollars available; FEMA priority; technical resources available. | Very expensive; requires operations and maintenance plan; may not make sense unless building expansion is planned. | Yes; direct impact on ability to save lives | Consider |
| Develop and maintain security at applicable critical assets. | Authority to perform; staff available to operate; grant dollars likely; technical resources available. | Can be expensive; requires constant maintenance and monitoring; requires IT professional. | Yes | Consider |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Authority to perform on school property; grant dollars possible; technical resources available. | Can be expensive; requires engineering; may involve property or impact property around the school adversely. | Not really, based on information available today about needs | Eliminate |
| Harden public buildings and utilities (structural retrofits) | Authority to perform; grant dollars possible; technical resources available. | Can be very expensive; requires engineering; old building may not accept some interventions. | Yes, as the building is aging. | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on District time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Authority to perform on District property; admin staff in place. | Very expensive on the scale needed; engineer is needed for technical aspects. | Possibly, but there are few internal streets, roads, and related infrastructure on campus. | Eliminate |
| Install quick-connect emergency generator hook-ups for facilities. | Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, but only if a building is not served by large fixed generator. | Consider |
| Install sprinkler systems in public buildings. | Authority to perform; modest admin staff needs; technical resources available. | Expensive; requires engineering design and ongoing maintenance as well as adequate water pressure. Requires technical staff not readily available; expensive; limited political support by the area’s energy supplier. | Yes, in at least some parts of the school campus | Consider |
| Investigate and implement alternative energy sources. | Authority to perform on school property; modest admin staff needs. | Requires intensive effort to keep public engaged, dedicated staff person. | Not really as a mitigation project at this scale | Eliminate |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service | Authority in place; admin staff in place; low cost; can increase demand for | | Yes, with consistent sustained effort. | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|---|--|--|-----------|
| clubs, city/school employees, etc.) Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | mitigation/capabilities for future projects. Authority to perform on property owned by school district; Modest admin staffing needs; | Unsure where a need exists; can be expensive; requires engineering design. | Potentially, depending on condition of existing infrastructure | Consider |
| Purchase snow trucks, plows, sanders. | Authority in place; modest admin cost; technical resources available. | Requires maintenance and staff to operate. | Not really; small size of school campus makes more sense to contract snow removal. | Eliminate |
| Purchase stand-by portable pumps and generators. | Authority in place; modest admin staff needs; technical staff available; modest cost. | Requires maintenance and fuel; requires use plan; political will seems modest. | Yes, when the facility is used for emergency sheltering | Consider |
| Purchase/install backup fixed power generators and pumps. | Authority in place; modest admin staff needs; technical staff available. | Can be expensive; requires maintenance and fuel; political will seems modest. | Yes | Consider |
| Store digital and hard copies of public records in low-risk, offsite locations. | Authority to perform; relatively low cost; admin staff available. | Requires an adopted policy and enhanced records maintenance effort. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | School partners with Alliant Energy for performance on District property; decreases future maintenance. | High to very high cost. | Yes | Consider |

Mitigation Capability Analysis by Action in SWCC Osceola Campus

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered in cost-benefit review or should be eliminated from further review.

Figure 4.33: Capability Analysis of Mitigation Actions – SWCC Osceola Campus

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|--|--|---|----------|
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; State and FEMA priority; grant funding available; regional and state resources available. | Very expensive; requires maintenance and sustained operations. | Yes | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on SWCC time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Authority to perform; admin staff in place; strong political will. | Very expensive on the scale needed; engineer is needed for technical aspects. | Yes | Consider |
| Install quick-connect emergency generator hook-ups for facilities. | Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, if SWCC does not wish to install a fixed generator to building | Consider |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Provide safe room education for builders and developers. | Authority to perform; technical staff available within college system; low cost. | Requires sustained effort. | Yes, if sustained and aggressive | Consider |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|---|---|--|-----------|
| Purchase snow trucks, plows, sanders. | Authority to perform; staffing in place to purchase and use equipment; grants available to help purchase. | Requires place of storage; requires maintenance and upkeep; expensive to purchase. | Not really; small size of school campus makes more sense to contract snow removal. | Eliminate |
| Purchase stand-by portable pumps and generators. | Authority in place; modest admin staff needs; technical staff available; modest cost. | Requires maintenance and fuel; requires use plan; political will seems modest. | Yes, if no fixed generator is installed instead | Consider |
| Purchase/install backup fixed power generators and pumps. | Authority in place; modest admin staff needs; technical staff available. | Can be expensive; requires maintenance and fuel; political will seems modest. | Yes | Consider |
| Store digital and hard copies of public records in low-risk, offsite locations. | Authority to perform; relatively low cost; admin staff available. | Requires an adopted policy and enhanced records maintenance effort. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | School partners with Alliant Energy for performance on District property; decreases future maintenance. | High to very high cost; not strong interest in the project but might make sense to Alliant in the long-term future. | Somewhat | Eliminate |

SWCC officials were surveyed about the college’s mitigation-related programs. The SWCC staff gave generally high marks for its enforcement of regulations and ordinances and consistency in following them; the jurisdiction’s quality and recency of regulations, ordinances, and policies; the community’s fire protection outreach and information to the public; the available on-campus communications equipment and systems; the jurisdiction’s effectiveness of watershed management plans and programs; and its effectiveness in managing disaster debris. SWCC staff gave a neutral rating for its ability to stay on top of capital improvements and facility maintenance needs rather than be reactive. Staff rated “above average” as to its willingness to implement StormReady efforts and “average” for its willingness to implement Firewise programs. NFIP and CRS are not relevant to the SWCC campus.

SWCC officials were also surveyed about the college’s resources at the Osceola campus. The staff stated the main resource limitation is the too many competing interests or too many projects (unable to focus). The following factors were given neutral or slightly positive scores: the lack of financial resources; the lack of staff to apply for and manage grants; lack of staff or consultants to implement actions and manage projects; the limited resources to navigate the legal aspects of hazard mitigation; and lack of political will to make tough decisions necessary to carry out long-term, controversial, or complicated projects.

Mitigation Capability Analysis by Action in Clarke County Hospital

The following table lists “New,” “Underway,” and “Carryover” mitigation actions and corresponding capabilities that can be expanded by action as well as capability limitations. Also, a brief conclusion is provided, whether the individual action should be considered in cost-benefit review or should be eliminated from further review.

Figure 4.34: Capability Analysis of Mitigation Actions – Clarke County Hospital

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|---|---|--|--|-----------|
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | Authority to perform; State and FEMA priority; grant funding available; regional and state resources available. | Very expensive; requires maintenance and sustained operations. | Yes | Consider |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | Authority to perform on hospital property; grant dollars possible; technical resources available. | Can be expensive; requires engineering; may involve property or impact property around the hospital adversely. | Not really, based on information available today about needs | Eliminate |

| Mitigation Action | Significant Capabilities | Significant Shortcomings | Solves a Problem or Addresses a Need? | Result |
|--|--|---|--|-----------|
| Harden public buildings and utilities (structural retrofits). | Authority to perform; grant dollars possible; technical resources available. | Can be very expensive; requires engineering. | Yes, due to the critical nature of the structure’s use | Consider |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | Authority to perform; increases support and awareness; low cost; can help save money. | Sometimes limited political will when there are many other demands on District time and funding. | Yes, a requisite action that makes the plan more relevant and moves projects forward. | Consider |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | Authority to perform; admin staff in place; strong political will. | Very expensive on the scale needed; engineer is needed for technical aspects. | Possibly, but there are few internal streets, roads, and related infrastructure on campus. | Eliminate |
| Install quick-connect emergency generator hook-ups for facilities. | Authority to perform; admin costs are low; if a portable generator, this option is low-cost compared to a large fixed generator. | Requires maintenance and electrician to install; can be expensive. | Yes, if hospital does not wish to install a fixed generator to building | Consider |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | Authority in place; admin staff in place; low cost; can increase demand for mitigation/capabilities for future projects. | Requires intensive effort to keep public engaged, dedicated staff person. | Yes, with consistent sustained effort. | Consider |
| Purchase snow trucks, plows, sanders. | Authority to perform; staffing in place to purchase and use equipment; grants available to help purchase. | Requires place of storage; requires maintenance and upkeep; expensive to purchase. | Not really; small size of hospital campus makes more sense to contract snow removal. | Eliminate |
| Purchase stand-by portable pumps and generators. | Authority in place; modest admin staff needs; technical staff available; modest cost. | Requires maintenance and fuel; requires use plan; political will seems modest. | Yes, if no fixed generator is installed instead | Consider |
| Purchase/install backup fixed power generators and pumps. | Authority in place; modest admin staff needs; technical staff available. | Can be expensive; requires maintenance and fuel; political will seems modest. | Yes | Consider |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | Hospital partners with Alliant Energy for performance on its property; decreases future maintenance. | High to very high cost; not strong interest in the project but might make sense to Alliant in the long-term future. | Somewhat | Eliminate |

4.6: Evaluation Process for Alternative Mitigation Measures

All participating jurisdictions were involved in the identification of possible mitigation actions, as outlined in the handouts used in the Appendix and contents of this chapter. The jurisdictions covered in the plan also helped with the evaluation of mitigation alternatives listed in this chapter through the prescribed process, as outlined in the next section.

This part of the plan addresses the following Stafford Act requirement:

Section 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.

Earlier in this chapter, the planning team identified by jurisdiction the mitigation actions that should be considered in the analysis that are not complete, underway, or in place. At the second planning meeting, the planning team reviewed each alternative for further discussion. The individual jurisdictions analyzed each action during this phase and some were eliminated from further consideration in some jurisdictions simply because they made no sense with the demographics and capabilities of the area. This section outlines actions that passed though the capability review.

Using FEMA and IHSEMD guidance publications, the planning team evaluated each of the proposed alternatives to determine which ones to remove from further consideration and to prioritize the remaining actions or measures.

Stakeholder Survey

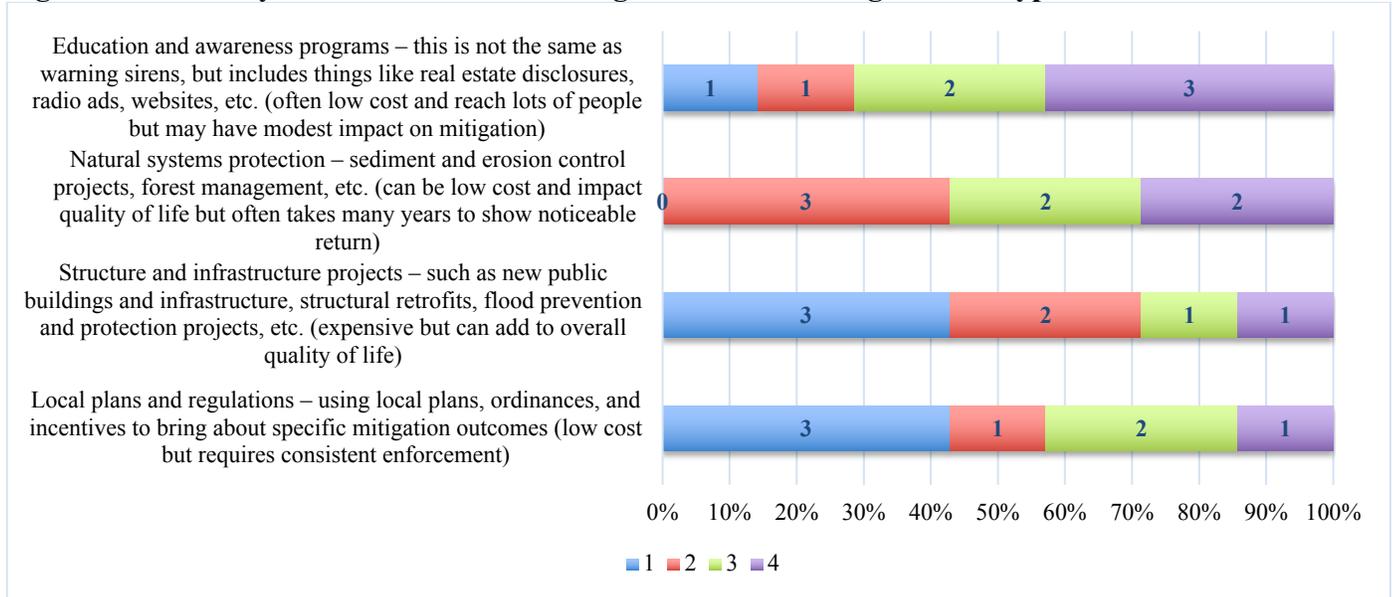
Early in the planning process, in early 2021, an online survey was performed to gauge general interest in implementing various possible mitigation actions. Each action was arranged under one of four primary types of measures shown in Section 4.2. These are simply example mitigation actions and are not necessarily tied to any given jurisdiction. The goal of this survey was to understand the types of factors that went into the actions with the most support versus those with the least support. The weight of factors like cost, administrative and technical needs and costs, and political may potentially be measured to some degree by this process.

Clarke County Plan Update – Stakeholder Survey

This new process has not been tried with previous plans. The following charts outline the results of the stakeholder surveys by category. Following the charts is a description of findings, which will help with the process of prioritizing actions. Eight persons responded to the survey in late winter 2021. Most of them identified as serving “all of Clarke County.” One person stated they serve the rural area. Two people stated they serve Osceola.

The second question on the survey was about the relative importance of each of the four types of mitigation actions. It reads: “The following describe each of the major FEMA defined types of mitigation actions. Please rank the relative importance of each for your jurisdiction based on the description provided and the ability of your description to carry out possible projects.” Seven of the eight people responded.

Figure 4.35: Survey Results of Potential Mitigation Action Categories or Types

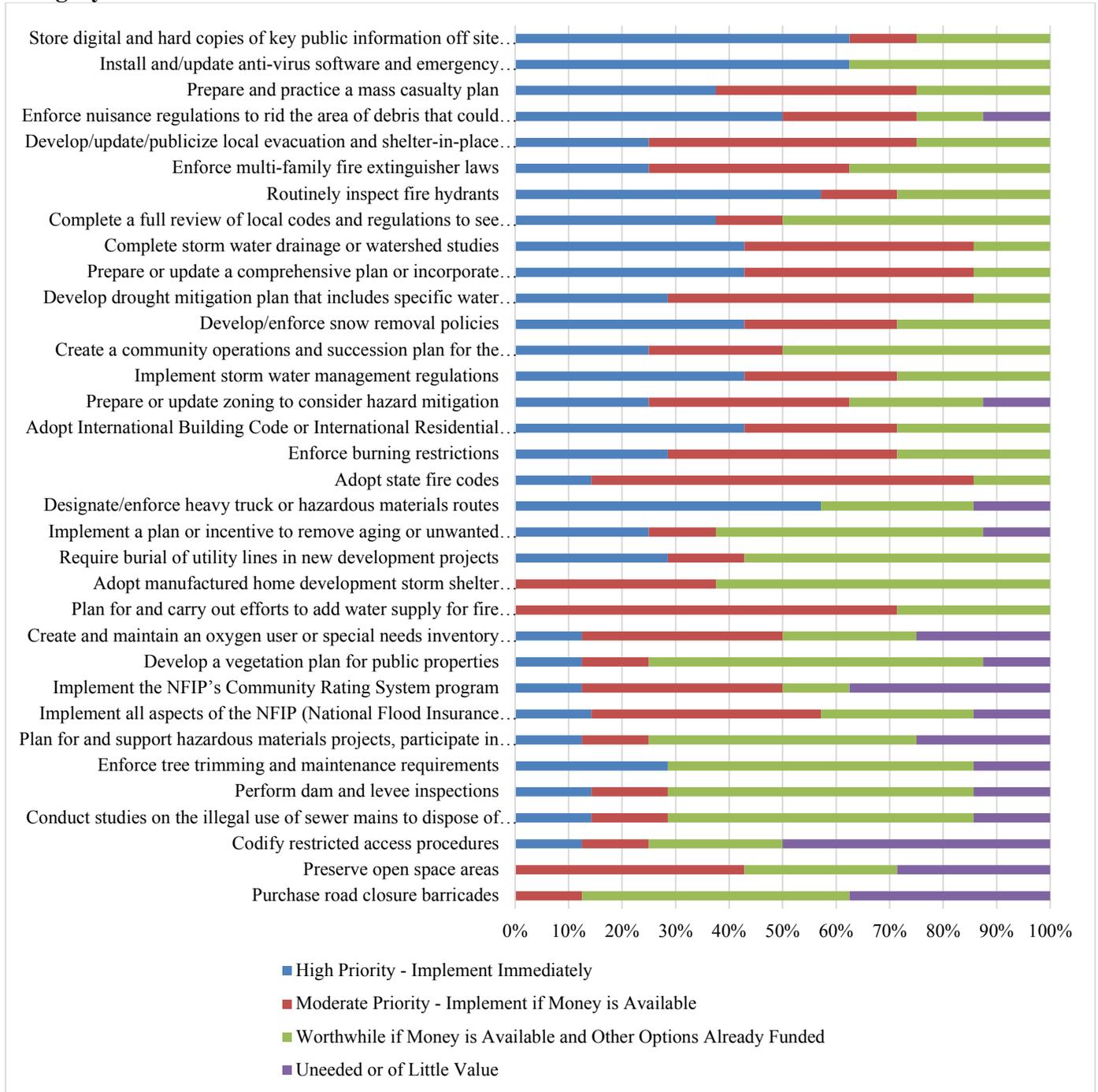


As this chart shows, structural and infrastructure projects were seen as the most popular, with local planning efforts coming in a close second, with three people giving the #1 ranking to each. The least popular option was education and awareness programs. It had three people ranking it #4 of the four options.

The third question on the survey was about the relative importance of various local plans and regulations types of projects. The question reads: “Please provide a rating of relevance or importance of the following

‘local plans and regulations’ type mitigation actions for your jurisdiction for implementation in the next five years (if unsure or no opinion, leave a line blank).” Some people, instead of rating an action, selected “already complete or in place,” which is reflected in the results below by an absence of a score.

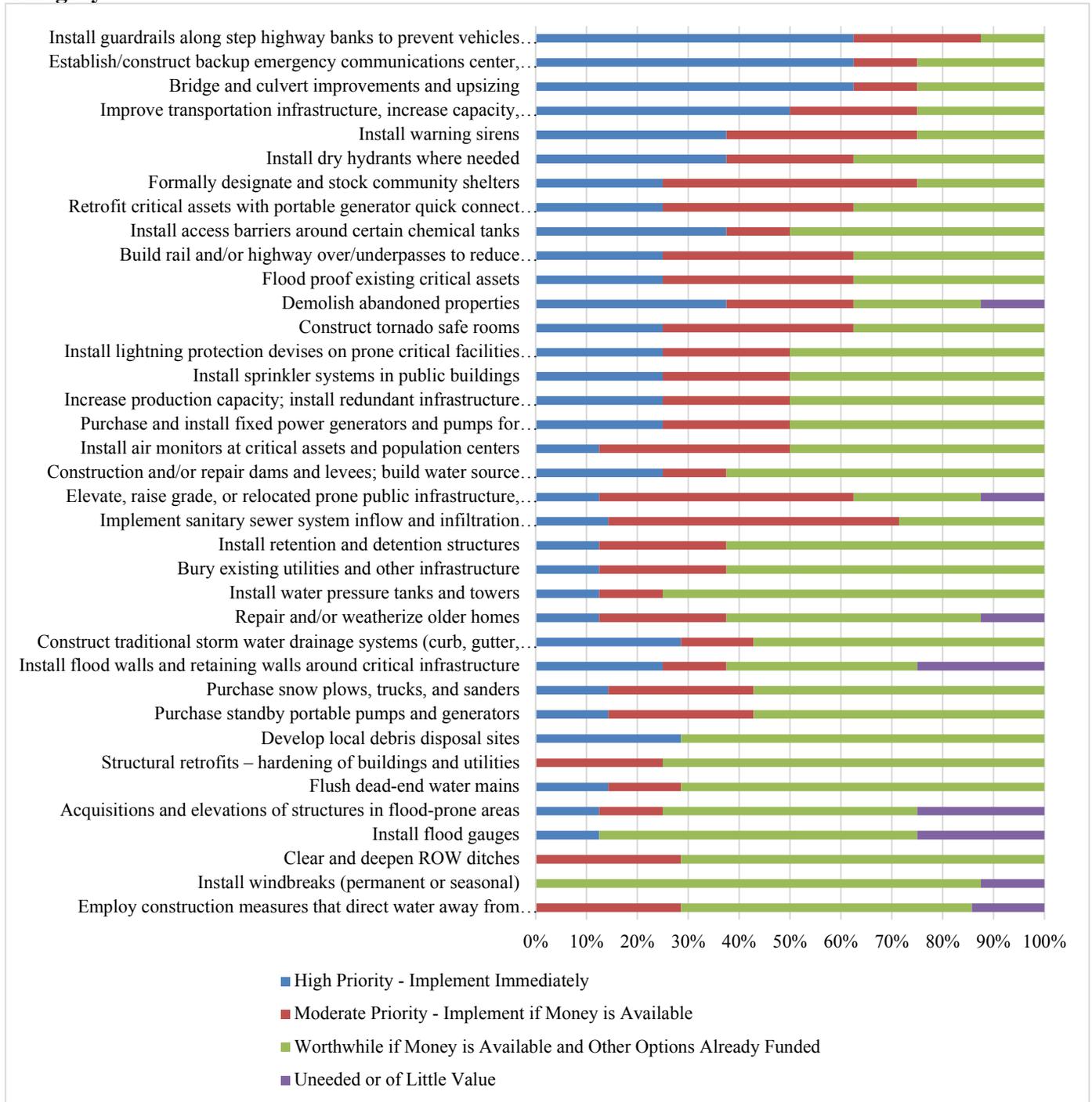
Figure 4:36: Survey Results of Potential Mitigation Actions in the “Local Plans and Regulations” Category



The most popular actions are toward the top of the chart. The most support is found for those that have a direct impact on function and response, such as protection of digital data and files and preparing a mass casualty plan. Widespread support was found for most of these kinds of actions, with the lowest support toward those that do not have a direct impact on functionality of local government or are related to flooding.

The fourth question on the survey was about the relative importance of various structural and infrastructure types of projects. The question reads: “Please provide a rating of relevance or importance of the following ‘structural and infrastructure projects’ type mitigation actions for your jurisdiction for implementation in the next five years (if unsure or no opinion, leave a line blank).” Some people, instead of rating an action, selected “already complete or in place,” which is reflected in the results below by an absence of a score.

Figure 4:37: Survey Results of Potential Mitigation Actions in the “Structural and Infrastructure” Category

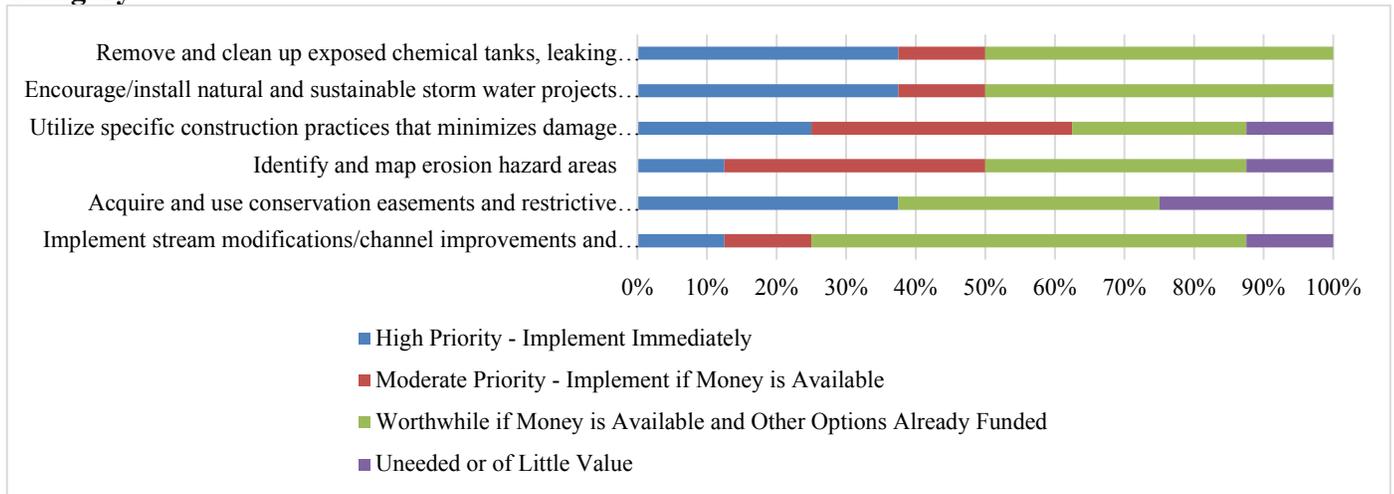


Overall, structural and infrastructure actions are considered by a modest margin more popular than other options due to the great impact on quality of life. Local officials like these kinds of actions because they

need to address citizen complaints and concerns over these issues anyway, such as road conditions and water quality. Transportation oriented, as well as emergency response, structural projects seem to have the most support by those who were surveyed. Only a few items, many of them flood-oriented, are considered unneeded or of little value.

The fifth question on the survey was about the relative importance of various natural systems protection types of projects. The question reads: “Please provide a rating of relevance or importance of the following ‘natural systems protection’ type mitigation actions for your jurisdiction for implementation in the next five years (if unsure or no opinion, leave a line blank).” Some people, instead of rating an action, selected “already complete or in place,” which is reflected in the results below by an absence of a score.

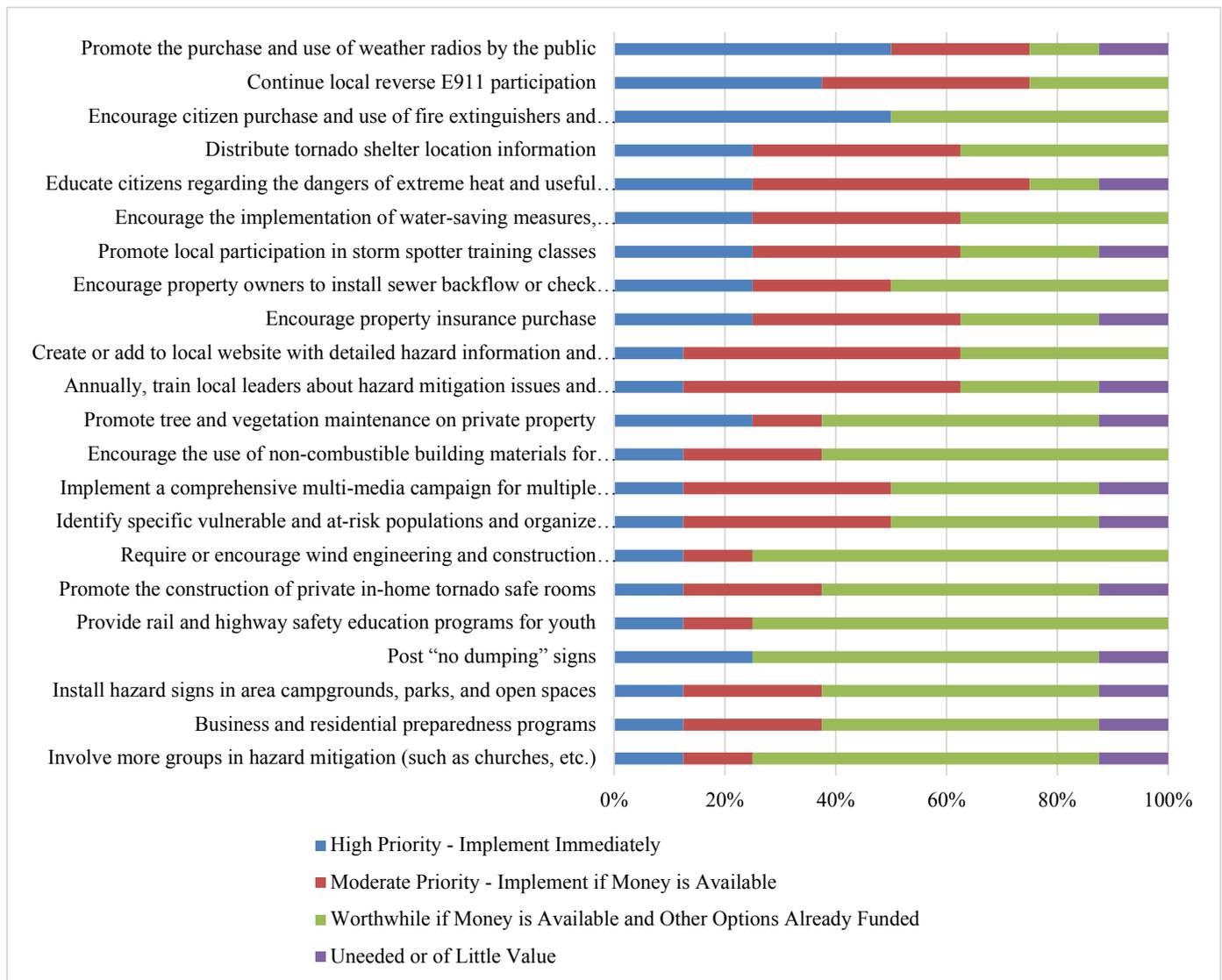
Figure 4:38: Survey Results of Potential Mitigation Actions in the “Natural Systems Protection” Category



Overall, there is moderate support for these types of actions from those surveyed. Those that impact water quality and reduce storm water flooding seem to have the most support.

The sixth question on the survey was about the relative importance of various public awareness programs. The question reads: Please provide a rating of relevance or importance of the following “education and awareness programs” type mitigation actions for your jurisdiction for implementation in the next five years (if unsure or no opinion, leave a line blank).

Figure 4:39: Survey Results of Potential Mitigation Actions in the “Public Education and Awareness” Category



Overall, there is no clear rationale that can be obtained from this chart, as pretty similar actions sometimes have very different levels of demand. There are few measures that less than 50% of respondents consider to be at least of moderate priority.

STAPLE-E

Each action was reviewed according to STAPLE-E criteria: **Social, Technical, Administrative, Political, Legal, Economic, and Environmental considerations**. The planning team has reviewed each of the proposed hazard mitigation alternatives and scored them on several factors for each STAPLE-E criteria. The planning team created 11 questions that are designed to comprehensively evaluate each mitigation action in terms of costs and benefits. Each alternative action is evaluated on a plus scale. Questions are designed to ensure a “yes” or “not applicable” answer. Each question gets two points for a strong positive answer in scientific or technical terms and two points based on public input in that jurisdiction (if public input is made). To the right of the chart is a locally determined rating for overall priority, as given by public input, with “high” being given 5 points, “moderate” being given 3 points, and “low” being given 1 point. The totals are to the right. The raw spreadsheets used to calculate the scores are in the Appendix.

The maximum score is 49 (4 times 11 plus 5 for a high interest item). Overall, the highest priority items have the highest scores.

The evaluation process does not necessarily pit two similar mitigation actions for one hazard and then selects one over the other. This is mainly because most mitigation measures impact many different hazards. The planning team wanted the scores to be independent of one another, with all projects being evaluated on their own merit.

Clarke County Plan Update – STAPLE-E

The prioritization process in this chapter/plan differs extensively from the previous plan. Looking at other approved plans in the State of Iowa, the planning team used a simpler review sheet that simplified the process for the reviewers at the meeting and had fewer analytic questions on which scores were based.

4.7: Evaluation Results of Alternative Mitigation Measures

The following tables provide the summary of the analysis of the proposed mitigation actions by jurisdiction, which will be used for creating a formal strategy for each jurisdiction in the next section of this plan. Please note that the local evaluation of actions means that an action may have differing scores for varying jurisdictions. For example, in one jurisdiction, the initiation and updating of zoning to include mitigation ideas may be considered more administratively feasible and politically acceptable than another community, even though the need in terms of hazard mitigation for zoning may be equal in both communities.

Rural Clarke County Alternative Mitigation Measure Scores

Ringgold County officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section. Items listed as “future” are those that are important but of such priority that they are not likely to be implemented within the next five years.

Figure 4.40: STAPLE-E Score and Relative Priority – Rural Clarke County

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Replace/upsized bridges and culverts. | 38 | High |
| Install warning sirens. | 38 | High |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 37 | High |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | 36 | High |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | 35 | High |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 34 | High |
| Maintain sandbags in dry storage. | 34 | High |
| Adopt International Building Code and/or International Residential Code. | 33 | High |
| Flood proof critical assets in the community/construct flood protection around assets. | 33 | High |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | 33 | High |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | 33 | High |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | 32 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 32 | Medium |
| Adopt/enforce tree trimming ordinances. | 31 | Medium |
| Promote the value of installation of private in-home tornado safe rooms. | 31 | Medium |
| Adopt manufactured home development storm shelter ordinances. | 30 | Medium |
| Complete storm water drainage or watershed studies of known flood areas. | 30 | Medium |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | 30 | Medium |
| Preserve open spaces in hazard areas. | 30 | Medium |
| Build highway or rail overpasses to reduce intersection accidents. | 29 | Low |
| Develop/update/publicize local evacuation and shelter-in-place plans. | 29 | Low |

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | 29 | Medium |
| Implement all aspects of the NFIP (National Flood Insurance Program). | 28 | Medium |
| Provide safe room education for builders and developers. | 28 | Future |
| Install air monitors at critical assets and population centers. | 26 | Future |
| Codify restricted access procedures. | 25 | Future |
| Install flood gauges. | 22 | Future |

City of Murray Alternative Mitigation Measure Scores

City of Murray officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section. Items listed as “future” are those that are important but of such priority that they are not likely to be implemented within the next five years.

Figure 4.41: STAPLE-E Score and Relative Priority – City of Murray

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | 42 | High |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | 42 | High |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | 42 | High |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | 42 | High |
| Purchase road closure barricades. | 42 | High |
| Adopt State fire codes. | 41 | High |
| Develop a vegetation management plan. | 41 | High |
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | 41 | Medium |
| Demolish abandoned properties. | 40 | High |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | 40 | High |
| Enforce multi-family housing extinguisher laws. | 40 | Medium |
| Post “no dumping” signs. | 40 | Medium |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 39 | High |
| Employ construction measures that direct water away from structures. | 39 | Medium |
| Install hazard signs in area campgrounds, parks, and open spaces. | 39 | Medium |
| Maintain trees proactively on public property and ROW areas. | 39 | Medium |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | 38 | Medium |
| Bridge and culvert improvements and upsizing. | 38 | High |
| Establish alert systems and specific outreach efforts for vulnerable populations. | 38 | Medium |
| Install quick-connect emergency generator hook-ups for facilities. | 38 | Medium |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | 37 | Medium |
| Install and/update anti-virus software and emergency communications technology. | 37 | Medium |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 37 | Medium |
| Clear and deepen ditches on ROWs. | 36 | High |
| Harden public buildings and utilities (structural retrofits). | 36 | Medium |
| Install retention and detention structures. | 36 | Medium |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | 36 | Medium |
| Preserve open spaces in hazard areas. | 36 | Medium |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | 36 | Medium |
| Store digital and hard copies of public records in low-risk, offsite locations. | 36 | Medium |
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | 35 | Medium |
| Encourage property owners to own adequate property insurance. | 35 | Medium |
| Enforce burning restrictions. | 35 | Medium |
| Flood proof critical assets in the community/construct flood protection around assets. | 35 | Medium |
| Adopt a continuity of operations & succession plan for the jurisdiction. | 34 | Medium |
| Adopt manufactured home development storm shelter ordinances. | 34 | Low |

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | 34 | Medium |
| Establish neighborhood watch programs for vulnerable populations. | 34 | Low |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | 34 | Low |
| Purchase/install backup fixed power generators and pumps. | 34 | Medium |
| Adopt/enforce tree trimming ordinances. | 33 | Medium |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | 33 | Low |
| Bury exposed utility and communications infrastructure. | 32 | Future |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | 32 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 32 | Medium |
| Purchase stand-by portable pumps and generators. | 32 | Low |
| Adopt International Building Code and/or International Residential Code. | 31 | Future |
| Fund weatherization programs to more low-income households. | 31 | Low |
| Implement storm water management regulations. | 31 | Low |
| Promote the value of installation of private in-home tornado safe rooms. | 31 | Low |
| Require or encourage wind engineering and construction techniques: anchor bolts, interlocking roof shingles, etc. | 30 | Future |
| Require burial of utility lines in new development. | 29 | Future |

City of Osceola Alternative Mitigation Measure Scores

City of Osceola officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section. Items listed as “future” are those that are important but of such priority that they are not likely to be implemented within the next five years.

Figure 4.42: STAPLE-E Score and Relative Priority – City of Osceola

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | 41 | High |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | 39 | High |
| Fund weatherization programs to more low-income households. | 39 | High |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | 39 | High |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | 36 | High |
| Bridge and culvert improvements and upsizing. | 35 | High |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 35 | High |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 35 | High |
| Establish alert systems and specific outreach efforts for vulnerable populations. | 34 | High |
| Facilitate the cleanup of abandoned properties, unused chemical storage, and other potential environmental hazards. | 34 | High |
| Harden public buildings and utilities (structural retrofits) | 34 | High |
| Maintain sandbags in dry storage. | 34 | Medium |
| Adopt a continuity of operations & succession plan for the jurisdiction. | 33 | Medium |
| Adopt manufactured home development storm shelter ordinances. | 33 | Medium |
| Flood proof critical assets in the community/construct flood protection around assets. | 33 | Medium |
| Implement storm water management regulations. | 33 | Medium |
| Implement stream modifications/channel improvements and stream bank stabilization. | 33 | Medium |
| Install quick-connect emergency generator hook-ups for facilities. | 33 | Medium |
| Promote the value of installation of private in-home tornado safe rooms. | 32 | Medium |
| Bury exposed utility and communications infrastructure. | 31 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 31 | Medium |
| Install warning siren(s). | 31 | Medium |
| Preserve open spaces in hazard areas. | 30 | Medium |
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | 29 | Medium |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | 29 | Medium |

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | 28 | Low |
| Develop/update/publicize local evacuation and shelter-in-place plans. | 28 | Low |
| Install hazard signs in area campgrounds, parks, and open spaces. | 28 | Low |
| Install sprinkler systems in public buildings. | 28 | Low |
| Codify restricted access procedures. | 27 | Low |
| Encourage property owners to own adequate property insurance. | 27 | Low |
| Provide safe room education for builders and developers. | 27 | Low |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | 26 | Low |
| Create and maintain a special needs/oxygen user registration program or inventory. | 26 | Low |
| Install air monitors at critical assets and population centers. | 26 | Low |
| Implement all aspects of the NFIP (National Flood Insurance Program). | 25 | Low |

City of Woodburn Alternative Mitigation Measure Scores

City of Woodburn officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section. Items listed as “future” are those that are important but of such priority that they are not likely to be implemented within the next five years.

Figure 4.43: STAPLE-E Score and Relative Priority – City of Woodburn

| Mitigation Action | STAPLE-E Score | Relative Priority |
|---|----------------|-------------------|
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | 39 | High |
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | 38 | High |
| Fund weatherization programs to more low-income households. | 38 | High |
| Purchase stand-by portable pumps and generators. | 38 | High |
| Promote the value of installation of private in-home tornado safe rooms. | 37 | High |
| Bridge and culvert improvements and upsizing. | 36 | High |
| Demolish abandoned properties. | 36 | High |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | 36 | Medium |
| Purchase snow trucks, plows, sanders. | 36 | High |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment/systems. | 36 | High |
| Adopt/enforce tree trimming ordinances. | 35 | Medium |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | 35 | High |
| Purchase road closure barricades. | 35 | Medium |
| Clear and deepen ditches on ROWs. | 34 | Medium |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.). | 34 | Medium |
| Install sidewalks. | | |
| Plan for and carry out efforts to add water supply for fire suppression. | 34 | High |
| Adopt State fire codes. | 33 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 33 | Medium |
| Store digital and hard copies of public records in low-risk, offsite locations. | 33 | Medium |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 33 | Medium |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | 32 | High |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | 31 | Medium |
| Bury exposed utility and communications infrastructure. | 31 | Medium |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | 31 | Medium |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 30 | Medium |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | 30 | Medium |
| Establish alert systems and specific outreach efforts for vulnerable populations. | 30 | Medium |
| Flood proof critical assets in the community/construct flood protection around assets. | 30 | Low |
| Implement stream modifications/channel improvements and stream bank stabilization. | 30 | Medium |
| Install quick-connect emergency generator hook-ups for facilities. | 30 | Medium |
| Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | 29 | Low |

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Participate in the FEMA Community Rating Service (CRS) program. | 29 | Future |
| Adopt a continuity of operations & succession plan for the jurisdiction. | 28 | Medium |
| Maintain sandbags in dry storage. | 28 | Low |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | 27 | Low |
| Install warning siren(s). | 26 | Low |
| Post “no dumping” signs. | 26 | Future |
| Create and maintain a special needs/oxygen user registration program or inventory. | 25 | Low |
| Complete storm water drainage or watershed studies of known flood areas. | 24 | Future |
| Encourage property owners to install sewer system backflow devises. | 23 | Low |
| Encourage property owners to own adequate property insurance. | 23 | Future |
| Increase production capacity - redundant systems and looping (water, sewer, electric, gas) including backup water well. – Focus on cellular and Internet capabilities. | 23 | Future |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | 22 | Future |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | 22 | Low |
| Install flood gauges. | 19 | Future |

Clarke Community Schools Alternative Mitigation Measure Scores

Clarke Community School District officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section.

Figure 4.44: STAPLE-E Score and Relative Priority – Clarke Schools

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 37 | High |
| Harden public buildings and utilities (structural retrofits) | 33 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 33 | Medium |
| Purchase/install backup fixed power generators and pumps. | 31 | Low |
| Purchase stand-by portable pumps and generators. | 30 | Low |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | 28 | Low |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 28 | Medium |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | 27 | High |
| Store digital and hard copies of public records in low-risk, offsite locations. | 27 | Low |
| Install hazard signs in area campgrounds, parks, and open spaces. | 26 | Low |

Murray Community Schools Alternative Mitigation Measure Scores

Murray Community School District officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section.

Figure 4.45: STAPLE-E Score and Relative Priority – Murray Schools

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Purchase stand-by portable pumps and generators. | 37 | High |
| Install quick-connect emergency generator hook-ups for facilities. | 36 | High |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 34 | High |
| Purchase/install backup fixed power generators and pumps. | 34 | Medium |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 33 | Medium |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | 33 | Medium |
| Develop and maintain security at applicable critical assets. | 32 | High |

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | 30 | High |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | 29 | Medium |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | 29 | High |
| Harden public buildings and utilities (structural retrofits). | 28 | Low |
| Install sprinkler systems in public buildings. | 28 | Low |
| Store digital and hard copies of public records in low-risk, offsite locations. | 28 | Medium |

SWCC Osceola Campus Alternative Mitigation Measure Scores

SWCC officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section.

Figure 4.46: STAPLE-E Score and Relative Priority – SWCC Osceola Campus

| Mitigation Action | STAPLE-E Score | Relative Priority |
|--|----------------|-------------------|
| Provide safe room education for builders and developers. | 49 | High |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 46 | High |
| Install quick-connect emergency generator hook-ups for facilities. | 45 | High |
| Purchase stand-by portable pumps and generators. | 40 | Medium |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | 39 | Medium |
| Purchase/install backup fixed power generators and pumps. | 35 | Medium |
| Store digital and hard copies of public records in low-risk, offsite locations. | 32 | High |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 29 | Low |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | 28 | High |

Clarke County Hospital Alternative Mitigation Measure Scores

Clarke County Hospital officials and staff, with the assistance of the countywide planning team, participated in the evaluation of a list of alternative mitigation measures. The following matrix shows the resulting scores and the identification of projects to be prioritized as a future mitigation measures, outlined in the next section.

Figure 4.47: STAPLE-E Score and Relative Priority – Clarke County Hospital

| Mitigation Action | STAPLE-E Score | Relative Priority |
|---|----------------|-------------------|
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) | 41 | Medium |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | 38 | Low |
| Install quick-connect emergency generator hook-ups for facilities. | 33 | Medium |
| Purchase stand-by portable pumps and generators. | 29 | Low |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | 28 | Medium |
| Purchase/install backup fixed power generators and pumps. | 28 | Low |
| Harden public buildings and utilities (structural retrofits). | 22 | Low |

The next few sections details the strategy for each jurisdiction for the implementation of this hazard mitigation plan.

4.8: Selection of Alternative Measures by Jurisdiction

As a means of implementing the goals and objectives, in this section, the alternative measures selected by jurisdiction are listed for further consideration later in the implementation strategy.

This part of the plan addresses the following Stafford Act requirement:

Section 201.6 (c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval of the plan.

This section addresses the selected mitigation actions, showing that multiple actions are selected for each jurisdiction.

Clarke County Plan Update Actions Included in the Previous Plan

This section is almost identical to the previous plan. However, the list of actions to be included has changed notably as a result of the modified review process described throughout this chapter.

The following matrix shows the alphabetized list of mitigation actions that are included in at least one jurisdiction’s strategy. The checkmarks indicate the jurisdictions that have selected the particular mitigation action as a new or carryover project for this plan. It lists those that the jurisdictions (local governments, schools, and other key stakeholder organizations in the county) seek to implement in the next five years from among the comprehensive list of alternatives provided.

Figure 4.48: Multi-jurisdictional List of Selected Mitigation Actions

| Mitigation Action | Clarke Co. | Murray | Osceola | Woodburn | Clarke Schools | Murray Schools | SWCC – Osceola | Clarke Co. Hosp. |
|---|------------|--------|---------|----------|----------------|----------------|----------------|------------------|
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | ✓ | ✓ | ✓ | ✓ | | | | |
| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | ✓ | ✓ | ✓ | | | | | |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | ✓ | | | ✓ | | | | |
| Adopt a continuity of operations & succession plan for the jurisdiction. | | ✓ | ✓ | ✓ | | | | |
| Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Adopt International Building Code and/or International Residential Code. | ✓ | | | | | | | |
| Adopt manufactured home development storm shelter ordinances. | ✓ | ✓ | ✓ | | | | | |
| Adopt State fire codes. | | ✓ | | ✓ | | | | |
| Adopt/enforce tree trimming ordinances. | ✓ | ✓ | | ✓ | | | | |
| Bridge and culvert improvements and upsizing. | ✓ | ✓ | ✓ | ✓ | | | | |
| Build highway or rail overpasses to reduce intersection accidents. | ✓ | | | | | | | |
| Bury exposed utility and communications infrastructure. | | | ✓ | ✓ | | | | |
| Clear and deepen ditches on ROWs. | | ✓ | ✓ | ✓ | | | | |
| Codify restricted access procedures. | | | ✓ | | | | | |
| Complete storm water drainage or watershed studies of known flood areas. | ✓ | | | | | | | |
| Construct or repair dams; develop reservoirs and lakes (flood control, water source). | ✓ | | | | | | | |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | | ✓ | ✓ | ✓ | | | | |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Create and maintain a special needs/oxygen user registration program or inventory. | | | ✓ | ✓ | | | | |
| Demolish abandoned properties. | | ✓ | | ✓ | | | | |
| Develop a vegetation management plan. | | ✓ | | | | | | |
| Develop/update/publicize local evacuation and shelter-in-place plans. | ✓ | | ✓ | | | | | |
| Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | | ✓ | | ✓ | | | | |
| Employ construction measures that direct water away from structures. | | ✓ | | | | | | |
| Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program. | | ✓ | | ✓ | | | | |
| Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | | ✓ | | | | | | |
| Encourage property owners to own adequate property insurance. | | ✓ | ✓ | ✓ | | | | |

| Mitigation Action | Clarke Co. | Murray | Osceola | Woodburn | Clarke Schools | Murray Schools | SWCC – Osceola | Clarke Co. Hosp. |
|--|------------|--------|---------|----------|----------------|----------------|----------------|------------------|
| Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | ✓ | | | | | | | |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | ✓ | ✓ | ✓ | ✓ | | | | |
| Enforce burning restrictions. | ✓ | | | | | | | |
| Enforce multi-family housing extinguisher laws. | ✓ | | | | | | | |
| Establish alert systems and specific outreach efforts for vulnerable populations. | ✓ | ✓ | ✓ | ✓ | | | | |
| Establish neighborhood watch programs for vulnerable populations. | ✓ | | | | | | | |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | ✓ | ✓ | ✓ | ✓ | | | | |
| Flood proof critical assets in the community/construct flood protection around assets. | ✓ | ✓ | ✓ | ✓ | | | | |
| Fund weatherization programs to more low-income households. | ✓ | ✓ | ✓ | ✓ | | | | |
| Harden public buildings and utilities (structural retrofits). | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Implement all aspects of the NFIP (National Flood Insurance Program). | ✓ | | ✓ | ✓ | | | | |
| Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | | | ✓ | | | | | |
| Implement storm water management regulations. | | ✓ | ✓ | | | | | |
| Implement stream modifications/channel improvements and stream bank stabilization. | | | ✓ | ✓ | | | | |
| Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | ✓ | ✓ | | ✓ | | | ✓ | |
| Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | | ✓ | | | | | | |
| Install air monitors at critical assets and population centers. | | | ✓ | | | | | |
| Install and/update anti-virus software and emergency communications technology. | | ✓ | | | | | | |
| Install hazard signs in area campgrounds, parks, and open spaces. | | ✓ | ✓ | ✓ | | | | |
| Install quick-connect emergency generator hook-ups for facilities. | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Install retention and detention structures. | | ✓ | | | | | | |
| Install sprinkler systems in public buildings. | | | ✓ | | | ✓ | | |
| Install warning siren(s). | ✓ | | ✓ | ✓ | | | | |
| Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.). | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Maintain sandbags in dry storage. | ✓ | | ✓ | ✓ | | | | |
| Maintain trees proactively on public property and ROW areas. | | ✓ | | | | | | |
| Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | ✓ | ✓ | | | | ✓ | | |
| Plan for and carry out efforts to add water supply for fire suppression. | | | | ✓ | | | | |
| Plan for and support hazardous materials projects, participate in regional teams, keep current with training. | ✓ | | | | | | | |
| Post “no dumping” signs. | | ✓ | | | | | | |
| Preserve open spaces in hazard areas. | ✓ | ✓ | ✓ | | | | | |
| Promote the value of installation of private in-home tornado safe rooms. | ✓ | ✓ | ✓ | ✓ | | | | |
| Promote to property owners the importance of tree and vegetation maintenance on private properties. | | | ✓ | ✓ | | | | |
| Provide safe room education for builders and developers. | | | ✓ | | | | ✓ | |
| Purchase road closure barricades. | | ✓ | | ✓ | | | | |
| Purchase snow trucks, plows, sanders. | | | | ✓ | | | | |
| Purchase stand-by portable pumps and generators. | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. | | ✓ | | ✓ | | | | |
| Purchase/install backup fixed power generators and pumps. | | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Set up incident command with schools, cities, and counties. *** | | | | | | | | ✓ |
| Store digital and hard copies of public records in low-risk, offsite locations. | | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| Strengthen exposed utility and communications infrastructure and systems (emergency and general). | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |

*** This is an added action during later discussion, as desired by the hospital.

4.9: Implementation Strategy by Jurisdiction

The most vital section of this entire plan is the strategy that each jurisdiction intends to carry out in order to mitigate hazards.

This part of the plan addresses the following Stafford Act requirements:

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action identified in paragraph (c)(3)(ii) of this section 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-benefit review of the proposed projects and associated costs.

Section 201.6 (c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

The mitigation strategy is a description of the proposed mitigation actions by jurisdiction that details the timeline, leadership, and funding for the action. The following tables provide the proposed implementation strategies for each jurisdiction. This process was reviewed and discussed during the third planning meeting.

The following mitigation strategy is prioritized for each jurisdiction based on a benefit-cost review that includes the STAPLE-E criteria outlined in Section 4.7 and the feasibility of implementing viable projects in the timeframe of this plan with consideration of current conditions and capabilities. The benefit-cost review considers the feasibility of the project and whether the benefits exceed the costs. Such considerations help form the priority level and timeline for the mitigation actions in the following tables. However, other factors help prioritize the actions in the existing timeline for each jurisdiction. These factors include outside influences, such as multijurisdictional actions that involve multiple partners and their timeframes.

The following mitigation strategy is today’s best estimate of when projects should be initiated and completed, the cost for each activity, who or which organization(s) should lead the effort, and possible funding sources (some of these data points are in the next section). Because funding is so complex and varies so much from year to year and changes after a major Presidential declaration, this plan includes only a generic list of sources. Local organizations, such as SICO, can be consulted to assist with the funding for a specific project. The planning team and each jurisdiction should keep in mind, however, that outside funding is limited and almost all projects and programs require some local funding and/or in-kind involvement (often called a “match”) to make the state, federal, private, or foundation support possible.

Note: for local governments, the listing “City” or “County” means the governing body and staff directly under the command of the governing body in most cases. As an example, actions that say “City Council” means that the council makes the decision, but staff members often carry it out. The “EMA” is the Emergency Management Agency. “BOS” is the County Board of Supervisors. If any town decides to disincorporate in the next five years, the rural county’s mitigation strategy, as much as is relevant to the effected jurisdiction, should prevail. If a school or the hospital closes, the city in which the assets are located covers mitigation in those areas.

Please note that when each jurisdiction adopts the plan the jurisdiction indicates willingness to implement the projects that are discussed in this section, more or less as proposed. Also note that some mitigation actions taken in one jurisdiction may affect hazard mitigation efforts in other jurisdictions even if such actions are not mentioned as part of the approved strategy for those other jurisdictions.

Clarke County Plan Update Actions Included in the Previous Plan

This section is almost identical to Section 9.3 of the previous plan. However, the jurisdictions have changed somewhat and the list of actions to be included has changed notably as a result of the modified review

process described throughout this chapter. Also, the way the data is organized is improved and more readable.

For the purposes of this strategy, each project is divided into short-, mid-, and long-term strategies, with timeframes mentioned. The following is a description of each:

- Short-term projects (2022 or 2023) – mainly high priority projects, projects that are initiated by other jurisdictions, or those that are essential planning steps.
- Mid-term projects (2024-2025) – most are moderate priority projects and those that other jurisdictions are likely to consider during the five years but are not scheduled yet.
- Long-term projects (2026 and beyond) – mostly low priority projects or are otherwise not yet scheduled because to some degree they are very aggressive or expensive projects.

Clarke County Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.49: Five-year Mitigation Strategy – Rural Clarke County

| Initiation | Action * | Likely Leadership | Duration |
|---|--|---|----------------------------------|
| Short-term projects (2022 or 2023) | Adopt manufactured home development storm shelter ordinances. | BOS, Zoning | 2022-2023 |
| | Adopt/enforce tree trimming ordinances. | BOS, Engineer, Utility providers | 2022-2023 |
| | Install warning sirens. | BOS, EMA, utility providers | 2022-2023 |
| | Adopt International Building Code and/or International Residential Code. | BOS, Zoning, Engineer | 2022-2023 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | BOS, EMA, IT Dept, Sheriff, REC, other utility providers | 2022-2024 |
| | Implement all aspects of the NFIP (National Flood Insurance Program). | BOS, EMA, Floodplain manager, IDNR | 2022-2027 |
| | Maintain sandbags in dry storage. | Engineer | Annually |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | EMA, SICOG | Annually |
| | Replace/upsized bridges and culverts. | BOS, Engineer | Continuous |
| | Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | BOS, Engineer | Continuous |
| | Construct or repair dams; develop reservoirs and lakes (flood control, water source). * | BOS, Reservoir Commission, RC&D | Continuous |
| | Plan for and support hazardous materials projects, participate in regional teams, keep current with training. * | BOS, EMA, LEPC, fire departments | Continuous |
| | Promote the value of installation of private in-home tornado safe rooms. | EMA, Zoning | Continuous |
| | Develop/update/publicize local evacuation and shelter-in-place plans. * | EMA, Red Cross, IHSEMD, FEMA | 2023 |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | BOS, EMA, Conservation | 2023-2024 |
| | Mid-term projects (2024-2025) | Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | BOS, EMA, Conservation, Engineer |
| Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | | BOS, EMA, Conservation, Engineer | 2023-2025 |
| Flood proof critical assets in the community/construct flood protection around assets. | | BOS, EMA, Conservation, Engineer | 2024-2025 |
| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | | BOS, Engineer, EMA | 2024-2025 |
| Complete storm water drainage or watershed studies of known flood areas. | | Conservation, Soil & Water Cons. Dist., NRCS | 2024-2025 |
| Preserve open spaces in hazard areas. | BOS, EMA, Conservation, IDNR, USDA, Zoning | 2025-2026 | |
| Build highway or rail overpasses to reduce intersection accidents. | BOS, Engineer, IDOT, BNSF | 2026-2027 | |

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|---|-------------------|-----------|
| Long-term projects (2026 and beyond) | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | EMA | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Murray Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.50: Five-year Mitigation Strategy – Murray

| Initiation | Action * | Likely Leadership | Duration |
|------------------------------------|--|--|------------|
| Short-term projects (2022 or 2023) | Install and/update anti-virus software and emergency communications technology. | Admin, applicable city departments | 2022 |
| | Adopt a continuity of operations & succession plan for the jurisdiction. | City council, admin, applicable city departments | 2022 |
| | Implement storm water management regulations. | City council, admin, city attorney, public works | 2022-2023 |
| | Store digital and hard copies of public records in low-risk, offsite locations. | City council, admin | 2022-2023 |
| | Purchase road closure barricades. | City council, public works | 2022-2023 |
| | Adopt State fire codes. * | City council, admin, city attorney, fire department | 2022-2023 |
| | Develop a vegetation management plan. | City council, public works | 2022-2023 |
| | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | City council, admin, city attorney, EMA | 2022-2023 |
| | Establish alert systems and specific outreach efforts for vulnerable populations. * | City council, admin, EMA, E911 director | 2022-2023 |
| | Bridge and culvert improvements and upsizing. | City council, admin, public works | 2022-2024 |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | City council, admin, public works | 2022-2024 |
| | Demolish abandoned properties. | City council, admin, public works | 2022-2025 |
| | Clear and deepen ditches on ROWs. | City council, public works | 2022-2025 |
| | Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. * | City council, admin, EMA, E911 director, Sheriff, fire department | 2022-2026 |
| | Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | City council, admin, public works | 2022-2026 |
| | Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | City council, admin, city attorney | 2022-2026 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | City council, admin, EMA, E911 director, Sheriff, fire department, utility providers | 2022-2026 |
| | Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program (incentive program would depend on outside resources/grants). | City council, fire department | Annually |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | City council, admin, EMA, SICOG | Annually |
| | Maintain trees proactively on public property and ROW areas. | City council, public works | Continuous |
| | Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards. | City council, admin, city attorney | Continuous |
| | Enforce multi-family housing extinguisher laws. * | City council, admin, city attorney, fire department | Continuous |
| | Employ construction measures that direct water away from structures. | Public works | Continuous |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | City council, admin | Continuous |
| | Enforce burning restrictions. | City council, admin, city attorney, public works | Continuous |

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|--|--|------------|
| | Adopt/enforce tree trimming ordinances. * | City council, admin, city attorney, fire department, electric provider, public works | Continuous |
| | Adopt manufactured home development storm shelter ordinances. | City council, admin, city attorney | 2023-2024 |
| | Promote the value of installation of private in-home tornado safe rooms. * | City council, admin, EMA | 2023-2024 |
| | Install quick-connect emergency generator hook-ups for facilities. | City council, admin, public works, fire department | 2023-2025 |
| Mid-term projects (2024-2025) | Encourage the use of non-combustible materials (i.e. stone, brick, etc.) for structures in wildfire hazard areas. | City council, admin, zoning/development | 2024-2025 |
| | Install hazard signs in area campgrounds, parks, and open spaces. | City council, public works | 2024-2025 |
| | Post “no dumping” signs. | City council, admin, public works | 2024-2025 |
| | Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other planning mechanisms. | City council, admin, third-party planning agency | 2024-2025 |
| | Purchase stand-by portable pumps and generators. | City council, public works | 2024-2025 |
| | Flood proof critical assets in the community/construct flood protection around assets. | City council, admin, public works | 2024-2026 |
| | Elevate, raise grade, or relocate roads, bridges, sewer lift stations, winches water pumps, and other infrastructure and critical assets. * | City council, admin, public works | 2024-2026 |
| | Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | City council, admin, public works, NRCS, Soil & Water Cons. Dist. | 2024-2026 |
| | Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | City council, admin, public works | 2024-2026 |
| | Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | City council, admin, public works | 2025-2027 |
| | Install retention and detention structures. | City council, admin, public works | 2025-2027 |
| | Encourage property owners to own adequate property insurance. * | City council, admin, EMA, insurance agents | Continuous |
| | Establish neighborhood watch programs for vulnerable populations. * | City council, Sheriff, civic groups, EMA | Continuous |
| Long-term projects (2026 and beyond) | Harden public buildings and utilities (structural retrofits) | City council, admin, public works, utility providers | 2026-2027 |
| | Preserve open spaces in hazard areas. | City council, admin, public works, city attorney | 2026-2027 |
| | Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance.) | City council, admin, zoning/development | 2026-2027 |
| | Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | City council, admin, public works | 2026-2027 |
| | Purchase/install backup fixed power generators and pumps. | City council, admin, public works | 2026-2027 |
| | Fund weatherization programs to more low-income households. | City council, admin | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Osceola Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.51: Five-year Mitigation Strategy – Osceola

| Initiation | Action * | Likely Leadership | Duration |
|------------------------------------|--|--|-----------|
| Short-term projects (2022 or 2023) | Adopt a continuity of operations & succession plan for the jurisdiction. | City council, admin, applicable city departments | 2022 |
| | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | City council, admin, city attorney, EMA | 2022-2023 |
| | Establish alert systems and specific outreach efforts for vulnerable populations. * | City council, admin, EMA, E911 director | 2022-2023 |

| Initiation | Action * | Likely Leadership | Duration |
|---|--|--|--|
| | Implement storm water management regulations. | City council, admin, public works | 2022-2023 |
| | Develop/update/publicize local evacuation and shelter-in-place plans. | City council, admin, public works, EMA | 2022-2023 |
| | Codify restricted access procedures. | City council, admin, city attorney | 2022-2023 |
| | Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | City council, admin, public works, utility providers | 2022-2025 |
| | Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | City council, admin, public works, utility providers | 2022-2025 |
| | Facilitate the cleanup of abandoned properties, unused chemical storage, and other potential environmental hazards. | City council, admin, public works, city attorney | 2022-2025 |
| | Implement stream modifications/channel improvements and stream bank stabilization. | City council, admin, public works, utility providers, IDALS | 2022-2025 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | City council, admin, EMA, E911 director, Sheriff, fire department, utility providers | 2022-2026 |
| | Fund weatherization programs to more low-income households. | City council, admin, SICOG, CCDC, other funders | 2022-2026 |
| | Bridge and culvert improvements and upsizing. | City council, admin, public works | 2022-2026 |
| | Promote to property owners the importance of tree and vegetation maintenance on private properties. * | City council, admin, public work, electric provider | Annually |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | City council, admin, EMA, SICOG | Annually |
| | Maintain sandbags in dry storage. | Public works | Continuous |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | City council, admin | Continuous |
| | Adopt manufactured home development storm shelter ordinances. | City council, admin, city attorney | 2023-2024 |
| | Promote the value of installation of private in-home tornado safe rooms. * | City council, admin, EMA | 2023-2024 |
| | Create and maintain a special needs/oxygen user registration program or inventory. * | City council, admin, EMA, fire department, electric provider, Clarke Co. Hospital | 2023-2024 |
| | Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers. | City council, admin, public works, utility providers | 2023-2025 |
| Mid-term projects (2024-2025) | Install quick-connect emergency generator hook-ups for facilities. | City council, admin, public works, EMA | 2024-2025 |
| | Implement all aspects of the NFIP (National Flood Insurance Program). | City council, EMA, Floodplain manager, IDNR | 2024-2025 |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | City council, admin, public works, EMA, parks and recreation | 2024-2026 |
| | Harden public buildings and utilities (structural retrofits). | City council, admin, public works, EMA, parks and recreation | 2024-2026 |
| | Flood proof critical assets in the community/construct flood protection around assets. | City council, admin, public works, EMA, flood manager | 2024-2026 |
| | Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | City council, admin, city attorney | 2025-2026 |
| | Install hazard signs in area campgrounds, parks, and open spaces. | City council, public works, parks and recreation | 2025-2026 |
| | Install sprinkler systems in public buildings. | City council, admin, public works, parks and recreation | 2025-2027 |
| | Encourage property owners to own adequate property insurance. * | City council, admin, EMA, insurance agents | Continuous |
| | Long-term projects (2026 and beyond) | Bury exposed utility and communications infrastructure. | City council, admin, public works, utility providers |
| Install warning siren(s). | | City council, admin | 2026-2027 |
| Preserve open spaces in hazard areas. | | City council, admin, public works, city attorney | 2026-2027 |
| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | | City council, admin, public works | 2026-2027 |
| Install air monitors at critical assets and population centers. | | City council, admin, public works, State of Iowa | 2026-2027 |
| | Provide safe room education for builders and developers. | City council, admin, EMA, SWCC, builders association | Continuous |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Woodburn Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.52: Five-year Mitigation Strategy – Woodburn

| Initiation | Action * | Likely Leadership | Duration |
|--|--|--|-----------------------------------|
| Short-term projects (2022 or 2023) | Adopt a continuity of operations & succession plan for the jurisdiction. | City council, admin, applicable city departments | 2022 |
| | Discourage/prohibit development in flood plain areas - join or continue participation in the NFIP. | City council, EMA, Floodplain manager, IDNR | 2024-2025 |
| | Adopt/enforce tree trimming ordinances. | City council, admin, city attorney | 2022-2023 |
| | Adopt State fire codes. * | City council, admin, city attorney, fire department | 2022-2023 |
| | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | City council, admin, city attorney, EMA | 2022-2023 |
| | Establish alert systems and specific outreach efforts for vulnerable populations. * | City council, admin, EMA, E911 director | 2022-2023 |
| | Facilitate the cleanup of abandoned properties, unused chemical storage, and other potential environmental hazards. | City council, admin, public works, city attorney | 2022-2025 |
| | Fund weatherization programs to more low-income households. | City council, admin, SICOG, CCDC, other funders | 2022-2026 |
| | Demolish abandoned properties. | City council, admin, public works | 2022-2025 |
| | Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems. * | City council, admin, EMA, E911 director, Sheriff, fire department | 2022-2026 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | City council, admin, EMA, E911 director, Sheriff, fire department, utility providers | 2022-2026 |
| | Promote to property owners the importance of tree and vegetation maintenance on private properties. * | City council, admin, public work, electric provider | Annually |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | City council, admin, EMA, SICOG | Annually |
| | Encourage citizen purchase/use of smoke detectors and fire extinguishers with an incentive program (incentive program would depend on outside resources/grants). | City council, fire department | Annually |
| | Store digital and hard copies of public records in low-risk, offsite locations. | City council, admin | Continuous |
| | Maintain sandbags in dry storage. | Public works | Continuous |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | City council, admin | Continuous |
| | Create and maintain a special needs/oxygen user registration program or inventory. * | City council, admin, EMA, fire department, electric provider, Clarke Co. Hospital | 2023-2024 |
| | Promote the value of installation of private in-home tornado safe rooms. * | City council, admin, EMA | 2023-2024 |
| | Mid-term projects (2024-2025) | Purchase snow trucks, plows, sanders. | City council, admin, public works |
| Purchase road closure barricades. | | City council, admin, public works | 2023-2024 |
| Clear and deepen ditches on ROWs. | | City council, admin, public works | 2023-2025 |
| Install warning siren(s). | | City council, admin, public works | 2023-2025 |
| Encourage property owners to install sewer system backflow devises. | | City council, admin, public works, utility provider | 2023-2025 |
| Purchase stand-by portable pumps and generators. | | City council, public works | 2024-2025 |
| Install quick-connect emergency generator hook-ups for facilities. | | City council, public works | 2024-2025 |
| Bridge and culvert improvements and upsizing. | | City council, admin, public works | 2024-2026 |
| Construct traditional storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | | City council, admin, public works | 2024-2027 |
| Construct/integrate public safe rooms in or near existing and future community assets and parks. | | City council, admin, public works, EMA | 2024-2027 |
| Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | | City council, admin, public works, utility providers | 2024-2027 |

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|--|--|-----------|
| | Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. | City council, admin, public works | 2025-2027 |
| | Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | City council, admin, public works, city attorney, IDNR, EMA, flood manager | 2025-2027 |
| | Flood proof critical assets in the community/construct flood protection around assets. | City council, admin, public works, EMA, flood manager | 2025-2027 |
| Long-term projects (2026 and beyond) | Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | City council, admin, public works | 2026-2027 |
| | Plan for and carry out efforts to add water supply for fire suppression. | City council, public works, fire department, EMA, county officials | 2026-2027 |
| | Bury exposed utility and communications infrastructure. | City council, admin, public works, utility providers | 2026-2027 |
| | Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | City council, admin, public works | 2026-2027 |
| | Implement stream modifications/channel improvements and stream bank stabilization. | City council, admin, public works, utility providers, IDALS | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Clarke Community Schools Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.53: Five-year Mitigation Strategy – Clarke Community Schools

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|---|--|------------|
| Short-term projects (2022 or 2023) | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | School board, admin, attorney, EMA | 2022-2023 |
| | Purchase stand-by portable pumps and generators. | School board, admin, facilities director | 2022-2023 |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | School board, admin, EMA, facilities director | 2022-2025 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | City council, admin, EMA, E911 director, Sheriff, fire department, utility providers | 2022-2026 |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | School board, admin, EMA, SICOG | Annually |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | School board, admin | Continuous |
| | Store digital and hard copies of public records in low-risk, offsite locations. | School board, admin, office staff, IT staff | Continuous |
| Mid-term projects (2024-2025) | Purchase/install backup fixed power generators and pumps. | School board, admin, facilities director | 2024-2025 |
| | Harden public buildings and utilities (structural retrofits). | School board, admin, facilities director | 2024-2026 |
| Long-term projects (2026 and beyond) | Install hazard signs in area campgrounds, parks, and open spaces. | School board, admin, facilities director | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Murray Community Schools Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.54: Five-year Mitigation Strategy – Murray Community Schools

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|---|--|------------|
| Short-term projects (2022 or 2023) | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | School board, admin, attorney, EMA | 2022-2023 |
| | Purchase/install backup fixed power generators and pumps. | School board, admin, facilities director | 2022-2023 |
| | Purchase stand-by portable pumps and generators. | School board, admin, facilities director | 2022-2023 |
| | Install quick-connect emergency generator hook-ups for facilities. | School board, admin, facilities director | 2022-2023 |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | School board, admin, EMA, facilities director | 2022-2025 |
| | Strengthen exposed utility and communications infrastructure and systems (emergency and general). * | City council, admin, EMA, E911 director, Sheriff, fire department, utility providers | 2022-2026 |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | School board, admin, EMA, SICOG | Annually |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | School board, admin | Continuous |
| Mid-term projects (2024-2025) | Make taller and exposed buildings, towers, and communications infrastructure lightning-proof. | School board, admin, facilities director | 2024-2025 |
| | Develop and maintain security at applicable critical assets. | School board, admin, facilities director | 2024-2025 |
| | Store digital and hard copies of public records in low-risk, offsite locations. | School board, admin, office staff, IT staff | Continuous |
| Long-term projects (2026 and beyond) | Harden public buildings and utilities (structural retrofits) | School board, admin, facilities director | 2026-2027 |
| | Install sprinkler systems in public buildings. | School board, admin, facilities director | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

SWCC Osceola Campus Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.55: Five-year Mitigation Strategy – SWCC Osceola Campus

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|--|---|------------|
| Short-term projects (2022 or 2023) | Purchase stand-by portable pumps and generators. | Admin, facilities director | 2022-2023 |
| | Install quick-connect emergency generator hook-ups for facilities. | Admin, facilities director | 2022-2023 |
| | Provide safe room education for builders and developers. | Admin, instructional staff, building trades staff | Annually |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | Admin, EMA, SICOG | Annually |
| | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | Admin, EMA | Continuous |
| | Store digital and hard copies of public records in low-risk, offsite locations. | Admin, EMA | Continuous |
| Mid-term projects (2024-2025) | Purchase/install backup fixed power generators and pumps. | Admin, facilities director | 2024-2025 |
| | Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.), and replace deteriorated infrastructure. * | Admin, facilities director, City of Osceola | 2024-2025 |
| Long-term projects (2026 and beyond) | Construct/integrate public safe rooms in or near existing and future community assets and parks. | Admin, facilities director, EMA | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

Clarke County Hospital Hazard Mitigation Strategy

Formed in part with the assistance of local officials, this mitigation strategy is what is adopted by the jurisdiction for implementation over the next five years. Knowing that events occur that change priorities and leadership, the jurisdiction commits to make a good faith effort. Each project is listed by timeframe/duration.

Figure 4.56: Five-year Mitigation Strategy – Clarke County Hospital

| Initiation | Action * | Likely Leadership | Duration |
|--------------------------------------|---|--|------------|
| Short-term projects (2022 or 2023) | Purchase stand-by portable pumps and generators. | Admin, facilities director | 2022-2023 |
| | Install quick-connect emergency generator hook-ups for facilities. | Admin, facilities director | 2022-2023 |
| | Purchase/install backup fixed power generators and pumps. | Admin, facilities director | 2022-2023 |
| | Set up incident command with schools, cities, and counties. | Admin, EMA, all other governmental jurisdictions | 2022-2023 |
| | Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year. * | Admin, EMA, SICOG | Annually |
| Mid-term projects (2024-2025) | Involve more groups in hazard mitigation (churches, chambers of commerce, civic/service clubs, city/school employees, etc.) * | Admin, EMA | Continuous |
| | Construct/integrate public safe rooms in or near existing and future community assets and parks. | Admin, facilities director, EMA | 2024-2025 |
| Long-term projects (2026 and beyond) | Harden public buildings and utilities (structural retrofits). | Admin, facilities director | 2026-2027 |

* This action is generally multi-jurisdictional and another jurisdiction in this plan (or not in this plan) will have an influence on the timeframe and scope.

4.10: Mitigation Action Summaries

The following tables show details about the selected mitigation actions, organized alphabetically, that may provide further guidance for each jurisdiction in hazard mitigation plan implementation.

| Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | |
|--|---|
| Primary hazard affected | Flood, River |
| Secondary hazard affected | Grass/wildland fire |
| Other key hazards affected | Some other hazards |
| Jurisdictions implementing | Murray, Osceola, Woodburn |
| Issue/plan for implementation | This action requires more detailed analysis of what specific areas should be targeted, with area-specific hazards, such as flooding, being the key. |
| Goals addressed | 1, 4, 5 |
| Potential partners | FEMA, IHSEMD, County EMA |
| Estimated total cost | \$10,000 to \$100,000 |
| Potential key funding sources | Local, State, FEMA, possible other public agencies |
| Benefits (losses avoided) | Prevention of future property losses and possible fatalities |

| Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas. | |
|---|---|
| Primary hazard affected | Flood, River |
| Secondary hazard affected | Grass/wildland fire |
| Other key hazards affected | Some other hazards |
| Jurisdictions implementing | Murray, Osceola |
| Issue/plan for implementation | This action requires more detailed analysis of what specific areas should be targeted, with area-specific hazards, such as flooding, being the key. |
| Goals addressed | 1, 4, 5 |
| Potential partners | FEMA, IHSEMD, IDNR, Iowa Natural Heritage Foundation, USDA NRCS |
| Estimated total cost | \$1,000 to \$100,000 |
| Potential key funding sources | Modest outside funding required or likely to be available except through land conservation programs, such as IDNR and INHF |
| Benefits (losses avoided) | Prevention of future property losses and possible fatalities |

| Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | |
|--|--------------|
| Primary hazard affected | Flood, River |

Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach.

| | |
|-------------------------------|--|
| Secondary hazard affected | Flood, Flash |
| Other key hazards affected | |
| Jurisdictions implementing | Clarke County, Woodburn |
| Issue/plan for implementation | This action requires more detailed analysis to determine where the issues are the worst. |
| Goals addressed | 1, 4, 5 |
| Potential partners | FEMA, IHSEMD, County EMA |
| Estimated total cost | \$10,000 to \$250,000 |
| Potential key funding sources | Local, State, FEMA, possible other public agencies |
| Benefits (losses avoided) | Prevention of future property losses and possible fatalities |

Adopt a continuity of operations & succession plan for the jurisdiction.

| | |
|-------------------------------|--|
| Primary hazard affected | Tornado |
| Secondary hazard affected | Human disease |
| Other key hazards affected | Most other hazards |
| Jurisdictions implementing | Murray, Osceola, Woodburn |
| Issue/plan for implementation | Work with other jurisdictions in the county and State/FEMA officials to prepare a written document and adopt it locally. |
| Goals addressed | 2, 5 |
| Potential partners | County EMA, State/FEMA and insurance entities providing technical assistance |
| Estimated total cost | \$5,000 |
| Potential key funding sources | Local, State, FEMA, possible other public agencies |
| Benefits (losses avoided) | Prevention of the loss of government function; continuity of government |

Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues.

| | |
|-------------------------------|--|
| Primary hazard affected | All hazards to some degree |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Osceola, Woodburn, Clarke Schools, Murray Schools |
| Issue/plan for implementation | While this may require concentrated work, taking ideas and strategies from this plan and including them in public policy updates is essential. |
| Goals addressed | 4, 5 |
| Potential partners | Local governments, property owners and facility managers. |
| Estimated total cost | \$5,000, mostly in the form of staff and elected official time; more if consultants required. |
| Potential key funding sources | Local, possible county/state/federal in-kind assistance. |
| Benefits (losses avoided) | Maintain government compliance; improved efficiency |

Adopt International Building Code and/or International Residential Code.

| | |
|-------------------------------|--|
| Primary hazard affected | Tornado/Windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Several other hazards |
| Jurisdictions implementing | Clarke County |
| Issue/plan for implementation | While such codes are available in a model sense, enforcement with properly trained technical staff may be a challenge for a small community. |
| Goals addressed | 3, 5 |
| Potential partners | Local governments |
| Estimated total cost | \$2,500; \$10,000 |
| Potential key funding sources | Local, FEMA/State funds |
| Benefits (losses avoided) | Prevention of future property losses and possible fatalities |

Adopt manufactured home development storm shelter ordinances.

| | |
|-------------------------------|---|
| Primary hazard affected | Tornado/Windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Severe winter storm; infrastructure failure |
| Jurisdictions implementing | Clarke County, Murray, Osceola |
| Issue/plan for implementation | Determine the location that makes sense for a modest but sturdy building. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments |
| Estimated total cost | \$2,500; \$100,000 to build shelter |
| Potential key funding sources | Local, property owners, possible FEMA/State funds |
| Benefits (losses avoided) | Protection of people vulnerable to natural hazards and loss of power. |

Adopt State fire codes.

| | |
|-------------------------|-----------------|
| Primary hazard affected | Structural fire |
|-------------------------|-----------------|

Adopt State fire codes.

| | |
|-------------------------------|--|
| Secondary hazard affected | Grass and wildland fire |
| Other key hazards affected | Hazardous Materials |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | The State may require these codes in all areas; larger towns have the resources to carry out administratively. |
| Goals addressed | 3, 5 |
| Potential partners | Local governments, property owners, Iowa Fire Marshal, local fire departments |
| Estimated total cost | Generally, less than \$10,000 upfront and \$5,000 per year to enforce/administer |
| Potential key funding sources | Local |
| Benefits (losses avoided) | Prevention of property loss; life safety |

Adopt tree trimming ordinances.

| | |
|-------------------------------|--|
| Primary hazard affected | Severe winter storm (primarily ice storm) |
| Secondary hazard affected | Tornado and windstorm |
| Other key hazards affected | Thunderstorm/lightning/hail, infrastructure failure |
| Jurisdictions implementing | Clarke County, Murray, Woodburn |
| Issue/plan for implementation | Will require the City/County to create an ordinance and means of enforcement; often managed by utilities providers |
| Goals addressed | 3, 5 |
| Potential partners | City governments, rural utility providers |
| Estimated total cost | \$500 to set up; enforcement costs should be minor but may vary from year to year. |
| Potential key funding sources | Local |
| Benefits (losses avoided) | Improve mitigation and general response, recovery efficiency; reduce structural losses. |

Bridge and culvert improvements and upsizing.

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incident |
| Secondary hazard affected | Flood, Flash |
| Other key hazards affected | Flood, River, infrastructure failure, possible other hazards |
| Jurisdictions implementing | Clarke County, Murray, Osceola, Woodburn |
| Issue/plan for implementation | A large part of the county and city budgets go to transportation projects just to maintain existing infrastructure. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, IDOT, Chariton Valley Transportation |
| Estimated total cost | \$50,000 to \$5,000,000, depending on project scope |
| Potential key funding sources | Local, DOT, FHWA, Chariton Valley Transportation |
| Benefits (losses avoided) | Prevention of property loss and potential fatalities; infrastructure preservation |

Build Highway or rail overpasses to reduce intersection accidents.

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incident |
| Secondary hazard affected | Flood, Flash |
| Other key hazards affected | Flood, River, infrastructure failure, severe winter storm |
| Jurisdictions implementing | Clarke County |
| Issue/plan for implementation | Redundant infrastructure is difficult to justify when competing for transportation funding, so the need will have to be clearly identified. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, IDOT, Chariton Valley Transportation |
| Estimated total cost | \$500,000 to \$5,000,000, depending on project scope |
| Potential key funding sources | Local, DOT, FHWA, Chariton Valley Transportation |
| Benefits (losses avoided) | Prevention of property loss and potential fatalities; infrastructure preservation |

Bury exposed utility and communications infrastructure.

| | |
|-------------------------------|---|
| Primary hazard affected | Energy failure |
| Secondary hazard affected | Severe winter storm |
| Other key hazards affected | Windstorm; tornado; thunderstorm and lightning |
| Jurisdictions implementing | Osceola, Woodburn |
| Issue/plan for implementation | Utilities are expensive to build and maintain; burial provides nearly permanent protection. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, utility providers, property owners |
| Estimated total cost | \$100,000 or more per jurisdiction |
| Potential key funding sources | Local, utility provider, possible USDA and FEMA grants, possible energy-based loans |
| Benefits (losses avoided) | Prevention of property loss; continuation of essential utilities; infrastructure preservation |

Clear and deepen ditches on ROWs.

| | |
|-------------------------|-------------|
| Primary hazard affected | Flash flood |
|-------------------------|-------------|

Clear and deepen ditches on ROWs.

| | |
|-------------------------------|--|
| Secondary hazard affected | Structural failure |
| Other key hazards affected | Human disease; transportation incidents |
| Jurisdictions implementing | Murray, Osceola, Woodburn |
| Issue/plan for implementation | This action can help with overall water flow, protect water and sewer lines, and reduce damages to streets in areas where curb and gutter does not exist. Cities and County own ROW areas. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, property owners |
| Estimated total cost | \$20,000 to \$50,000 per year of work |
| Potential key funding sources | Local, FEMA/State, property owners, USDA, Iowa SRF program |
| Benefits (losses avoided) | Prevention of property loss; infrastructure preservation; maintained property valuation |

Codify restricted access procedures.

| | |
|-------------------------------|--|
| Primary hazard affected | Terrorism |
| Secondary hazard affected | Flood, river |
| Other key hazards affected | Transportation incidents, flood, flash |
| Jurisdictions implementing | Osceola |
| Issue/plan for implementation | This is more of a law enforcement issue and may be a challenge to enforce over the length of an emergency. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, regional and state law enforcement agencies, IHSEMD |
| Estimated total cost | \$2,500 plus any cost of enforcement, which will vary by incident |
| Potential key funding sources | Limited outside funding available |
| Benefits (losses avoided) | Prevention of fatalities; protection of government assets |

Complete storm water drainage or watershed studies of known flood areas.

| | |
|-------------------------------|---|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Flood, river |
| Other key hazards affected | Transportation incidents |
| Jurisdictions implementing | Clarke County |
| Issue/plan for implementation | Consultants are required to fully analyze drainage patterns and recommend solutions for each situation. |
| Goals addressed | 3, 5 |
| Potential partners | Local governments, property owners, consultants |
| Estimated total cost | \$10,000 per jurisdiction or project area |
| Potential key funding sources | USDA, Iowa SRF program, local |
| Benefits (losses avoided) | Continuation of essential utilities; infrastructure preservation |

Construct or repair dams; develop reservoirs and lakes (flood control, water source).

| | |
|-------------------------------|--|
| Primary hazard affected | Dam and levee failure |
| Secondary hazard affected | Flood, flash |
| Other key hazards affected | Infrastructure failure; human disease, river flood, pipeline transportation incident |
| Jurisdictions implementing | Clarke County |
| Issue/plan for implementation | This pertains mostly to the planned reservoir but also can include other projects that address flooding potential in areas where damage is considerable. |
| Goals addressed | 3, 4, 5 |
| Potential partners | Local governments, Iowa DNR |
| Estimated total cost | \$1,000 per year plus any repair costs identified |
| Potential key funding sources | Local, possible IDNR funding |
| Benefits (losses avoided) | Prevention of dam failure and loss to property, infrastructure, and life downstream |

Construct storm water drainage (underground, culverts, curb & gutter, etc.) – improve capacity of existing systems.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Transportation incidents |
| Other key hazards affected | Infrastructure failure |
| Jurisdictions implementing | Murray, Osceola, Woodburn |
| Issue/plan for implementation | Storm water remains a problem as excessive rain events seem to be more common. Storm water flows over streets and into buildings. Hard infrastructure can be built in ROW areas. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, property owners, consulting engineers |
| Estimated total cost | \$100,000 (varies by type and extent of SOW) |
| Potential key funding sources | FEMA/State, USDA, Iowa SRF program, CDBG |
| Benefits (losses avoided) | Infrastructure preservation; prevention of property loss |

Construct/integrate public safe rooms in or near existing and future community assets and parks.

| | |
|-------------------------------|---|
| Primary hazard affected | Tornado and windstorm |
| Secondary hazard affected | Thunderstorm, lightning, and hail |
| Other key hazards affected | Structural failure |
| Jurisdictions implementing | All jurisdictions |
| Issue/plan for implementation | This offers almost 100% protection to populations during tornadoes and other severe weather. FEMA and State funding is available for dual-use facilities in public areas and schools. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, property owners, State/FEMA |
| Estimated total cost | \$500,000+ (varies by size) |
| Potential key funding sources | FEMA/State, local |
| Benefits (losses avoided) | Life safety |

Create and maintain a special needs/oxygen user registration program or inventory

| | |
|-------------------------------|---|
| Primary hazard affected | Infrastructure failure (structural fire and energy failure) |
| Secondary hazard affected | Glass and wildland fire |
| Other key hazards affected | Possibly other hazards |
| Jurisdictions implementing | Osceola, Woodburn |
| Issue/plan for implementation | There is always an issue of privacy with this kind of action and it would have to be voluntary. |
| Goals addressed | 1, 2, 3, 5 |
| Potential partners | Local governments, regional response agencies, LEPC, fire departments, utility providers |
| Estimated total cost | \$1,000/year estimated |
| Potential key funding sources | Local, no outside sources likely needed or available |
| Benefits (losses avoided) | Jurisdictional efficiency and continuity; prevention of unnecessary loss of life or health |

Demolish abandoned properties.

| | |
|-------------------------------|---|
| Primary hazard affected | Windstorm |
| Secondary hazard affected | Structural failure (structural fire) |
| Other key hazards affected | Tornado; wildland fire |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | As populations decline and shift to new areas and as buildings age, abandoned buildings will always be found. Annual budgeting for this purpose is vital in some jurisdictions. |
| Goals addressed | 1, 4, 5 |
| Potential partners | Local governments, property owners |
| Estimated total cost | \$15,000 per property, but varies by size and scope of work |
| Potential key funding sources | Local, possible grants from housing agencies |
| Benefits (losses avoided) | Maintained property valuation; life safety |

Develop a vegetation management plan.

| | |
|-------------------------------|---|
| Primary hazard affected | Infrastructure failure |
| Secondary hazard affected | Grass and wildland fire |
| Other key hazards affected | Transportation incidents, flood, flash |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | This requires a continued effort to stay on top of the issue; requires a way to dispose of debris. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, utility providers, those with an interest in landscaping and beautification |
| Estimated total cost | \$1,000 for the plan plus any enforcement costs |
| Potential key funding sources | Local, possible grants from various agencies, utility company resources |
| Benefits (losses avoided) | Jurisdictional efficiency and continuity; property protection; prevention of unnecessary loss of life or health |

Develop/update/publicize local evacuation and shelter-in-place plans.

| | |
|-------------------------------|---|
| Primary hazard affected | Hazardous materials |
| Secondary hazard affected | Severe winter storms |
| Other key hazards affected | Most other hazards |
| Jurisdictions implementing | Clarke County, Osceola |
| Issue/plan for implementation | This requires extensive planning, drills, law enforcement support, and education of the public about the issues and process |
| Goals addressed | 1, 2, 3, 5 |
| Potential partners | Local governments, law enforcement agencies |
| Estimated total cost | \$1,000 for the plan plus any enforcement costs |
| Potential key funding sources | Local, possible grants from various agencies, IHSEMD |
| Benefits (losses avoided) | Jurisdictional efficiency and continuity; prevention of unnecessary loss of life or health |

Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure/critical assets.

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incidents |
| Secondary hazard affected | Flood, flash |
| Other key hazards affected | Flood, river; energy failure; pipeline transportation incident; hazardous materials |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | Infrastructure upgrades are a vital issue in rural Iowa, where a low-density population disperses resources to manage the durable infrastructure needed. Significant planning is necessary. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, possible property owners who own adjacent land |
| Estimated total cost | \$100,000 to \$2 million, depending on type and SOW |
| Potential key funding sources | Local, FEMA/State, Iowa DOT, Federal transportation funding, USDA, Iowa SRF, CDBG |
| Benefits (losses avoided) | Infrastructure preservation; life safety; economic impact (fewer detours and delays) |

Employ construction measures that direct water away from structures.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Flood, river |
| Other key hazards affected | Infrastructure failure |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | This action requires greater thought and planning about how buildings are designed and sites are prepared than typical construction. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, IHSEMD, FEMA, IDNR, construction companies and advocates, architects and engineers |
| Estimated total cost | \$1,000 to \$10,000 for planning; costs for projects will vary widely |
| Potential key funding sources | Local, grants available for specific projects from agencies concerned with flood protection and building stability |
| Benefits (losses avoided) | Infrastructure preservation; life safety |

Encourage citizen purchase/use of smoke detectors and fire extinguishers; incentive program.

| | |
|-------------------------------|---|
| Primary hazard affected | Infrastructure failure (structural fire) |
| Secondary hazard affected | Hazardous materials (pipeline transportation incident) |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | It takes constant effort to keep people thinking about fire prevention in their homes and businesses. Programs are available for local fire department use. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, EMA, fire departments |
| Estimated total cost | Up to \$10,000 annually (depending on scope and nature of incentives) |
| Potential key funding sources | Local, FEMA AFG grant, local foundations and private sources |
| Benefits (losses avoided) | Life safety; engagement of the public |

Encourage clustering of residential lots outside of hazard areas in subdivision design/review (as part of updated subdivision ordinance).

| | |
|-------------------------------|--|
| Primary hazard affected | Grass and wildland fire |
| Secondary hazard affected | Flood, river |
| Other key hazards affected | Possibly other hazards |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | Today, Murray does not have modern subdivision review processes and growth potential is modest; adding comprehensive planning and zoning would be an early step. |
| Goals addressed | 3, 5 |
| Potential partners | Local governments, planning agencies such as SICOG, consultants, FEMA, IHSEMD |
| Estimated total cost | Up to \$10,000 for document preparation |
| Potential key funding sources | Local, outside funding would be limited |
| Benefits (losses avoided) | Infrastructure preservation; life safety |

Encourage property owners to own adequate property insurance.

| | |
|-------------------------------|--|
| Primary hazard affected | All hazards to some degree, except river flooding, which is Federally funded through the NFIP |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Osceola, Woodburn |
| Issue/plan for implementation | With partners, local governments can use various methods to promote the public purchasing adequate insurance to cover losses. Insurance companies, banks, and realtors can be engaged. |
| Goals addressed | 1, 3 |
| Potential partners | Local governments, insurance companies, banks, real estate firms, property owners |
| Estimated total cost | \$500 annually |
| Potential key funding sources | Local, local insurance companies |

Encourage property owners to own adequate property insurance.

Benefits (losses avoided) Prevention of property loss; engagement of the public

Encourage the use of non-combustible materials for structures in wildfire hazard areas.

Primary hazard affected Wildland fire
 Secondary hazard affected Structural failure
 Other key hazards affected
 Jurisdictions implementing Murray
 Issue/plan for implementation Two approaches exist: simply encouragement via public information efforts and inclusion of this idea in building permit or zoning requirements for both public and private properties.
 Goals addressed 1, 3, 5
 Potential partners Local governments, property owners, business interests, fire departments
 Estimated total cost \$500 per year for encouragement efforts
 Potential key funding sources Local, sustainability groups/foundations
 Benefits (losses avoided) Prevention of property loss; life saving

Encourage/install sustainable storm water control and water quality practices.

Primary hazard affected Flood, flash
 Secondary hazard affected Structural failure
 Other key hazards affected Flood, river, human disease
 Jurisdictions implementing Murray, Osceola, Woodburn
 Issue/plan for implementation Natural partners are already in place and sustainable practices, such as rain gardens, are becoming more popular; encouragement can be supplemented with cost-share programs.
 Goals addressed 1, 3, 5
 Potential partners Local governments, local SWDC/NRCS offices, Iowa Dept. of Agriculture, ISU Extension
 Estimated total cost \$5,000 per practice, may exceed \$100,000 annually countywide
 Potential key funding sources USDA, IA Dept. of Ag, ISU Extension, private foundations, CDBG program, Iowa SRF program
 Benefits (losses avoided) Quality of life, property protection, reliable water supplies

Enforce burning restrictions.

Primary hazard affected Grass and wildland fire
 Secondary hazard affected Structural fire
 Other key hazards affected
 Jurisdictions implementing Murray
 Issue/plan for implementation The County would pass an ordinance and provide a means to enforce it when conditions warrant imposition of the restrictions.
 Goals addressed 1, 3, 5
 Potential partners Local governments, local law enforcement
 Estimated total cost \$1,000 annually
 Potential key funding sources Technical assistance from the State Fire Marshal as needed
 Benefits (losses avoided) Life safety, property protection, prevention

Enforce multi-family housing extinguisher laws.

Primary hazard affected Structural fire
 Secondary hazard affected Hazardous materials
 Other key hazards affected
 Jurisdictions implementing Murray
 Issue/plan for implementation The County would pass an ordinance and provide a means to enforce it.
 Goals addressed 5
 Potential partners Local governments, local law enforcement
 Estimated total cost \$500 annually
 Potential key funding sources Technical assistance from the State Fire Marshal as needed
 Benefits (losses avoided) Life safety, property protection, prevention

Establish alert systems and specific outreach efforts for vulnerable populations.

Primary hazard affected Most hazards to some degree
 Secondary hazard affected
 Other key hazards affected
 Jurisdictions implementing Murray, Osceola, Woodburn
 Issue/plan for implementation This requires identification of populations to be served and why they are not served High Hispanic population makes this more relevant.
 Goals addressed 1, 3
 Potential partners Local governments, EMA, possible State agencies, communications providers
 Estimated total cost \$1,000 or so, but could vary based on scope of effort
 Potential key funding sources Local, IHSEMD, possible other State agencies

Establish alert systems and specific outreach efforts for vulnerable populations.

Benefits (losses avoided) Life safety; improved participation in mitigation planning and implementation of projects

Establish neighborhood watch programs for vulnerable populations.

Primary hazard affected Most hazards to some degree
 Secondary hazard affected
 Other key hazards affected
 Jurisdictions implementing Murray
 Issue/plan for implementation Requires vigilance among the citizenry to be practical.
 Goals addressed 1, 3
 Potential partners Local governments, EMA, possible State agencies, civic organizations
 Estimated total cost \$1,000 or so, but could vary based on scope of effort
 Potential key funding sources Local, IHSEMD, possible other State agencies
 Benefits (losses avoided) Life safety

Facilitate the cleanup of abandoned and nuisance properties, unused chemical storage, and other potential environmental hazards.

Primary hazard affected Hazardous materials
 Secondary hazard affected Infrastructure failure (structure failure and fire)
 Other key hazards affected Human disease
 Jurisdictions implementing Clarke County, Murray, Osceola, Woodburn
 Issue/plan for implementation Requires extensive legal work in some cases; can be expensive and time-consuming.
 Goals addressed 3, 5
 Potential partners Local governments, EMA, fire departments, IDNR, EPA
 Estimated total cost \$10,000+ depending on scope of work and complexity of the problem
 Potential key funding sources Local, State agencies, IDNR, EPA, possible other federal agencies
 Benefits (losses avoided) Life safety and health; property protection; prevention of hazards

Flood proof critical assets in the community.

Primary hazard affected Flood, river
 Secondary hazard affected Flood, flash
 Other key hazards affected Infrastructure failure, transportation failure
 Jurisdictions implementing Clarke County, Murray, Osceola, Woodburn
 Issue/plan for implementation Must identify what the flood risk for each building and structure.
 Goals addressed 1, 3, 4
 Potential partners Local governments, EMA, facility owners
 Estimated total cost \$10,000 or more depending on scope of work
 Potential key funding sources Local, FEMA/State, local foundations, USDA, facility owners
 Benefits (losses avoided) Protection of property; local continuity of operations

Fund weatherization programs to more low-income households.

Primary hazard affected Structural failure
 Secondary hazard affected Severe winter storm
 Other key hazards affected Tornado/windstorm; thunderstorm/lightning/hail, extreme heat, flash flood
 Jurisdictions implementing Murray, Osceola, Woodburn
 Issue/plan for implementation This is a major quality of life issue and adds property value. The issue remains how to involve public dollars in this issue.
 Goals addressed 1, 3
 Potential partners Local governments, property owners, SICOG, SCICAP
 Estimated total cost Up to \$25,000 per unit
 Potential key funding sources SCICAP, USDA, CDBG, foundations and housing grants
 Benefits (losses avoided) Life safety; basic health; prevention of property loss, improved quality of life

Harden public buildings and utilities (structural retrofits).

Primary hazard affected Tornado
 Secondary hazard affected Windstorm
 Other key hazards affected Thunderstorm/lightning/hail; severe winter storm; structural failure
 Jurisdictions implementing Murray, Osceola, Clarke Schools, Murray Schools, Clarke County Hospital
 Issue/plan for implementation This lengthens the life of buildings even if no disasters occur that would otherwise cause damage. Standards should be implemented in any building improvements.
 Goals addressed 1, 2, 3, 5
 Potential partners Local governments, State/FEMA
 Estimated total cost \$500,000, more or less depending on building size and SOW
 Potential key funding sources FEMA/State, local, CDBG, USDA, Iowa SRF program
 Benefits (losses avoided) Continuation of essential utilities; prevention of property loss; life saving

Hold annual meetings in each jurisdiction to review plan progress and prepare a strategy for the coming fiscal year.

| | |
|-------------------------------|---|
| Primary hazard affected | All hazards to some degree |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | All jurisdictions |
| Issue/plan for implementation | This is a standard action to implement this plan and meet State/FEMA requirements. Each year the jurisdiction will meet, discuss, and record comments related to the plan, including an evaluation of projects implemented in the past year and a budget for projects to be undertaken in the following year. Formal amendments will be requested to the State/FEMA, as needed. |
| Goals addressed | 3, 4 |
| Potential partners | Local governments, EMA, possible SICOG and State/FEMA |
| Estimated total cost | No outside funding; simply part of meeting and budget process |
| Potential key funding sources | Local only |
| Benefits (losses avoided) | Plan implementation; engagement of the public |

Implement all aspects of the NFIP.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, river |
| Secondary hazard affected | Structural failure |
| Other key hazards affected | Human disease incident, flood, flash |
| Jurisdictions implementing | Clarke County, Osceola, Woodburn |
| Issue/plan for implementation | The NFIP is the only way of insuring against flooding. Participation is a necessary local requirement where FHAs exist. The IDNR can manage or delegate authority. |
| Goals addressed | 2, 3, 4, 5 |
| Potential partners | Local governments, FEMA, IDNR, local flood manager(s) |
| Estimated total cost | \$1,000 startup cost |
| Potential key funding sources | Local, FEMA, IDNR |
| Benefits (losses avoided) | Prevention of property loss; maintain government compliance |

Implement sanitary sewer system inflow and infiltration projects, including new mains and impervious manhole covers.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Infrastructural failure |
| Other key hazards affected | Human disease incident, transportation incident, hazardous materials incident |
| Jurisdictions implementing | Osceola |
| Issue/plan for implementation | Required as part of water quality compliance where inflow is occurring to the sewer system; requires engineering and can be very expensive |
| Goals addressed | 1, 3, 4, 5 |
| Potential partners | Local governments, IDNR, EPA, IFA |
| Estimated total cost | \$25,000+ per project or over \$1 million for major sewer reconstruction |
| Potential key funding sources | Local, IEDA CDBG program, USDA, Iowa SRF program, other federal funds |
| Benefits (losses avoided) | Continuation of essential utilities and infrastructure; prevention of property loss; life saving. |

Implement storm water management regulations.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Structural failure |
| Other key hazards affected | Possibly other hazards |
| Jurisdictions implementing | Murray, Osceola |
| Issue/plan for implementation | Along with a storm water utility created to intake funds for projects, regulations can ensure building projects consider impact on water flow to surrounding properties. |
| Goals addressed | 2, 3, 4, 5 |
| Potential partners | Local governments, FEMA, IDNR, local flood manager(s), planning agencies such as SICOG |
| Estimated total cost | \$2,500 startup costs |
| Potential key funding sources | Local, FEMA, IDNR, IFA |
| Benefits (losses avoided) | Prevention of property loss; preservation of infrastructure |

Implement stream modifications/channel improvements and stream bank stabilization.

| | |
|-------------------------------|--|
| Primary hazard affected | Flood, river |
| Secondary hazard affected | Flood, flash |
| Other key hazards affected | Transportation incidents, infrastructure failure; structural failure |
| Jurisdictions implementing | Osceola, Woodburn |
| Issue/plan for implementation | Is consistent with the Iowa Water Quality Initiative, which has some funding tied to it; requires study and partnerships with water quality agencies; requires engagement with landowners. |
| Goals addressed | 1, 3, 4, 5 |
| Potential partners | Local governments, property owners, State agencies (IDALS and IDNR), FEMA, EMA, local S&WCDs, USDA/NRCS |
| Estimated total cost | Costs vary widely depending on scope of work |

Implement stream modifications/channel improvements and stream bank stabilization.

| | |
|-------------------------------|--|
| Potential key funding sources | Local, possible FEMA, USDA, IDALS, IDNR, CDBG program, SRF program |
| Benefits (losses avoided) | Prevention of property loss; infrastructure preservation; pollution prevention/water quality |

Improve transportation infrastructure (resurface, pave, widen roads, increase bridge capacity, etc.).

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incident |
| Secondary hazard affected | Flash flood |
| Other key hazards affected | Structural failure |
| Jurisdictions implementing | Clarke County, Murray, Woodburn, SWCC |
| Issue/plan for implementation | Infrastructure upgrades are a vital issue in rural Iowa, where a low-density population disperses resources to manage the durable infrastructure needed. Significant planning is necessary. |
| Goals addressed | 1, 3,5 |
| Potential partners | Local governments, possible property owners adjacent to transportation routes |
| Estimated total cost | \$100,000 to \$2 million |
| Potential key funding sources | Local, RUTF, Iowa DOT, Federal highway funding, bonding, TIF, and special assessments |
| Benefits (losses avoided) | Infrastructure preservation; life safety; local government efficiency/continuity |

Incorporate stand-alone elements for hazard mitigation into the local comprehensive (land use) plan and other local plans.

| | |
|-------------------------------|---|
| Primary hazard affected | Most hazards to some degree |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | A comprehensive plan addresses the long-term trends and needs of a jurisdiction. Incorporating ideas and strategies from this plan into a jurisdiction’s general plan ensures implementation. Associated with this is the imposition of zoning. |
| Goals addressed | 2, 3, 4, 5 |
| Potential partners | Local governments, a planning agency or consultant such as SICOG, EMA |
| Estimated total cost | \$2,500 unless it is entire plan re-write, which will be at least \$10,000 |
| Potential key funding sources | Local, possible FEMA/State, private foundations |
| Benefits (losses avoided) | Improved data sharing; improved efficiency; maintain government compliance; reduce structural losses; prevent some hazards. |

Install air monitors.

| | |
|-------------------------------|---|
| Primary hazard affected | Terrorism |
| Secondary hazard affected | Hazardous materials |
| Other key hazards affected | Human disease, possible other hazards that impact air quality, such as grass/wildland fire |
| Jurisdictions implementing | Osceola |
| Issue/plan for implementation | Requires purchase, monitoring, and maintenance; placement priorities may be an issue but monitors would be placed in populated areas to alert officials of the existence of dangerous air quality conditions. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, FEMA/State, possible IDNR and IDOT, CDC, IDPH |
| Estimated total cost | Likely less than \$10,000 per unit; modest operations costs. |
| Potential key funding sources | Local, possible state and federal grants, possible private foundation grants |
| Benefits (losses avoided) | Life safety; basic health; continuity of operations |

Install and/or update anti-virus software and emergency communications technology.

| | |
|-------------------------------|--|
| Primary hazard affected | Terrorism |
| Secondary hazard affected | Infrastructure failure |
| Other key hazards affected | Human disease, hazardous materials, possibly other hazards |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | Requires purchase, monitoring, and maintenance; requires vigilance to remain in forefront of threats and changes in technology |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, FEMA, IHSEMD, IT professionals |
| Estimated total cost | Likely modest and mostly local cost |
| Potential key funding sources | Mostly local, possible grants from State |
| Benefits (losses avoided) | Continuity of operations; sustainability of infrastructure; possible human health |

Install hazard signs in area campgrounds, parks, and open spaces.

| | |
|----------------------------|---|
| Primary hazard affected | Tornado/windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Hazardous materials; severe winter storm; flash flood |
| Jurisdictions implementing | Murray, Osceola, Woodburn |

| | |
|-------------------------------|---|
| Issue/plan for implementation | Areas impacted should be evaluated to determine what is needed, with tornado and thunderstorm safety the most notable issues. |
| Goals addressed | 1 |
| Potential partners | Local governments, EMA, insurance providers |
| Estimated total cost | Likely up to \$20,000 |
| Potential key funding sources | Local, IDNR, possible other recreational grant sources |
| Benefits (losses avoided) | Life safety; possible protection of private property exposed to hazards in warned area. |

Install quick-connect emergency generator hook-ups for facilities.

| | |
|-------------------------------|--|
| Primary hazard affected | Tornado and windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Hazardous materials; severe winter storm; flash flood |
| Jurisdictions implementing | Murray, Osceola, Woodburn, Murray School, SWCC, Clarke County Hospital |
| Issue/plan for implementation | Is a great activity for an entity that has on hand or has access to an emergency generator but not the resources or justification for a larger fixed generator |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, EMA, service providers, possibly IHSEMD, utility providers |
| Estimated total cost | Likely up to \$50,000 |
| Potential key funding sources | Local, FEMA, IHSEMD, possibly other state and federal funds |
| Benefits (losses avoided) | Life safety; possible protection of public buildings exposed to the weather. |

Install retention and detention structures.

| | |
|-------------------------------|---|
| Primary hazard affected | Flood, flash |
| Secondary hazard affected | Drought |
| Other key hazards affected | Infrastructure failure |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | Due to the flat land in Murray, providing a means to channel water to small detention basins can reduce flash flooding of standing water. |
| Goals addressed | 1, 3, 4 |
| Potential partners | Local governments, property owners, conservation organizations, NRCS, SWCD |
| Estimated total cost | \$10,000 to \$50,000, possibly more for unique systems, like the underground system currently being installed in Osceola |
| Potential key funding sources | Local, local conservation groups, State and Federal water quality cost share programs |
| Benefits (losses avoided) | Life safety and health; property and infrastructure protection; prevention of hazards |

Install sprinkler systems in public buildings.

| | |
|-------------------------------|--|
| Primary hazard affected | Infrastructure failure (primarily structural fire) |
| Secondary hazard affected | Hazardous materials incident |
| Other key hazards affected | |
| Jurisdictions implementing | Osceola, Murray Schools |
| Issue/plan for implementation | Can be very expensive, so usually they are not installed except where required by law. |
| Goals addressed | 1, 4, 5 |
| Potential partners | Local governments, fire departments, Iowa State Fire Marshal, state agencies affected |
| Estimated total cost | \$100,000 or more depending on scope of work |
| Potential key funding sources | Building owners; possible State/Federal grants, local private foundation grants |
| Benefits (losses avoided) | Life safety; property protection |

Install warning sirens.

| | |
|-------------------------------|--|
| Primary hazard affected | Tornado and windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Possible other incidents as programmed into the system |
| Jurisdictions implementing | Clarke County, Osceola, Woodburn |
| Issue/plan for implementation | Sirens must be purchased, installed, tested, and connected to some kind of trigger system; addressed because existing sirens may not meet needs in five years. |
| Goals addressed | 1, 5 |
| Potential partners | Local governments, fire department, county E911 |
| Estimated total cost | Likely up to \$30,000 |
| Potential key funding sources | Local, USDA, possible community foundation grants, property owners, occasionally FEMA |
| Benefits (losses avoided) | Life safety |

Involve more groups in hazard mitigation.

| | |
|----------------------------|--------------------|
| Primary hazard affected | Nearly all hazards |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | All jurisdictions |

Involve more groups in hazard mitigation.

| | |
|-------------------------------|--|
| Issue/plan for implementation | This action really is just to increase the number of groups within and assisting said jurisdictions targeted and sustained by continual projects that engage them. |
| Goals addressed | 2, 3, 4 |
| Potential partners | Local governments, EMA, possible FEMA/State, other interest groups, business groups |
| Estimated total cost | \$500 annually |
| Potential key funding sources | Local |
| Benefits (losses avoided) | Engagement of the public; increase in efficiency and effectiveness |

Maintain sandbags in dry storage.

| | |
|-------------------------------|---|
| Primary hazard affected | Flood, river |
| Secondary hazard affected | Flood, flash |
| Other key hazards affected | Infrastructure failure, transportation incident, hazardous materials |
| Jurisdictions implementing | Clarke County, Osceola, Woodburn |
| Issue/plan for implementation | The main issue is providing the space with proper humidity and then means to move sandbags into place in emergency. |
| Goals addressed | 5 |
| Potential partners | Local governments, EMA, possible FEMA/State |
| Estimated total cost | \$1,000+ |
| Potential key funding sources | Local, possible grants, although likely to be very limited |
| Benefits (losses avoided) | Life safety and health; property and infrastructure protection; prevention of hazards |

Maintain trees proactively on public property and ROW areas.

| | |
|-------------------------------|---|
| Primary hazard affected | Severe winter storm |
| Secondary hazard affected | Tornado/windstorm |
| Other key hazards affected | Thunderstorm/lightning/hail; infrastructure failure; transportation incident; grass and wildland fire |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | Overgrowth of vegetation can result in hazards and exacerbate others. Costs to manage vegetation grow exponentially as vegetation grows. Requires place for disposal. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, utility companies, conservation groups |
| Estimated total cost | \$2,500 per year |
| Potential key funding sources | Local, utility companies directly; possible grants for beautification projects |
| Benefits (losses avoided) | Life safety and health; property and infrastructure protection; prevention of hazards |

Make taller and exposed buildings, towers, and communications infrastructure lightning-proof.

| | |
|-------------------------------|---|
| Primary hazard affected | Thunderstorm/lightning/hail |
| Secondary hazard affected | Infrastructure failure (structural fire and energy failure) |
| Other key hazards affected | |
| Jurisdictions implementing | Clarke County, Murray, Murray Schools |
| Issue/plan for implementation | Study would determine the best means to provide protection for any targeted structure. |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, building owners, utility providers |
| Estimated total cost | \$25,000 to \$100,000 in most cases |
| Potential key funding sources | Local, possible state or FEMA grants, USDA |
| Benefits (losses avoided) | Property protection, infrastructure preservation, continuity of operations, life safety |

Plan for and carry out efforts to add water sources for fire suppression.

| | |
|-------------------------------|--|
| Primary hazard affected | Grass and wildland fire |
| Secondary hazard affected | Infrastructure failure (primarily structural fire) |
| Other key hazards affected | Drought, hazardous materials incident |
| Jurisdictions implementing | Woodburn |
| Issue/plan for implementation | Woodburn is noted for the lack of fire flow water capacity. SIRWA and local fire departments may work on proposals to supply water needs in these areas. |
| Goals addressed | 1, 5 |
| Potential partners | Utility providers, possible FEMA/State, USDA possibly, engineering team |
| Estimated total cost | \$10,000 to \$25,000 depending on scope of study and research |
| Potential key funding sources | Local, State, USDA, federal programs, environmental grants, possible CDBG and SRF programs |
| Benefits (losses avoided) | Continued operations and efficiency; life safety; protection of property and prevention of loss. |

Plan for and support hazardous materials projects, participate in regional teams, keep current with training.

| | |
|----------------------------|--|
| Primary hazard affected | Hazardous materials incident |
| Secondary hazard affected | Infrastructure failure (structural fire and energy failure) |
| Other key hazards affected | Windstorm, tornado, wildland fire, severe winter storm, transportation incidents |

| | |
|-------------------------------|--|
| Jurisdictions implementing | Clarke County |
| Issue/plan for implementation | Hazardous materials agreements are available from regional agencies that can help local fire and first response departments; can be costly for limited use; local role in HAZMAT enforcement is likely limited but not non-existent. |
| Goals addressed | 1, 2, 3, 5 |
| Potential partners | Local governments, FEMA/State, regional response agencies, LEPC |
| Estimated total cost | \$10,000/year estimated; individual projects and investments may be higher |
| Potential key funding sources | Local, possible State/FEMA |
| Benefits (losses avoided) | Jurisdictional efficiency and continuity; property protection; prevention of unnecessary loss of life or health |

Post “no dumping” signs.

| | |
|-------------------------------|---|
| Primary hazard affected | Hazardous materials incident |
| Secondary hazard affected | transportation incidents |
| Other key hazards affected | Windstorm, tornado, wildland fire, severe winter storm, human disease |
| Jurisdictions implementing | Murray |
| Issue/plan for implementation | Signage would require enforcement to be most effective. City has limited resources for enforcement. No site for such signage has been identified. |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, County Sheriff |
| Estimated total cost | \$1,000 for signage |
| Potential key funding sources | Local, possible small grants |
| Benefits (losses avoided) | Prevention of property damage and possible human health issues |

Preserve open spaces in hazard areas.

| | |
|-------------------------------|---|
| Primary hazard affected | Flood, River |
| Secondary hazard affected | Flood, Flash |
| Other key hazards affected | Windstorm, tornado, wildland fire, infrastructure failure |
| Jurisdictions implementing | Clarke County, Murray, Osceola |
| Issue/plan for implementation | Identifying the specific property and the hazard(s) involved is a key to this activity. Funds would be required to acquire and maintain the property. |
| Goals addressed | 1, 2, 3, 5 |
| Potential partners | Local governments, IDNR, County Conservation, groups like Iowa Natural Heritage Foundation |
| Estimated total cost | \$10,000 per acre |
| Potential key funding sources | Local, IDNR, Federal grants |
| Benefits (losses avoided) | Property protection, infrastructure preservation, continuity of operations |

Promote the value of installation of private in-home tornado safe rooms.

| | |
|-------------------------------|--|
| Primary hazard affected | Tornado and windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Possibly severe winter storms and structural failure |
| Jurisdictions implementing | Clarke County, Murray, Osceola, Woodburn |
| Issue/plan for implementation | These are becoming more affordable and increasingly available on an individual basis. Promotion of these facilities through local partners can increase use; are manufactured in the region. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, EMA, property owners |
| Estimated total cost | \$500 (plus additional funding if incentives to purchase them are offered) |
| Potential key funding sources | EMA, FEMA/State, local, engaged property owners |
| Benefits (losses avoided) | Life safety; prevention of property loss |

Promote to property owners the importance of tree and vegetation maintenance on private properties.

| | |
|-------------------------------|---|
| Primary hazard affected | Grass and wildland fire |
| Secondary hazard affected | Windstorm |
| Other key hazards affected | Tornado, drought, plant disease, severe winter storm, infrastructure failure |
| Jurisdictions implementing | Osceola, Woodburn |
| Issue/plan for implementation | Overgrowth of vegetation can result in hazards and exacerbate others. Costs to manage vegetation grow exponentially as vegetation grows. Can be accomplished by encouragement methods and code enforcement. |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, property owners, conservation groups |
| Estimated total cost | \$500 or less per year (plus enforcement costs if code enforcement is involved) |
| Potential key funding sources | Local, property owners (fees), possible grants for beautification projects |
| Benefits (losses avoided) | Prevention of property loss |

Provide safe room education for builders and developers

| | |
|-------------------------------|---|
| Primary hazard affected | Tornado/windstorm |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Infrastructure failure |
| Jurisdictions implementing | Osceola, SWCC |
| Issue/plan for implementation | FEMA resources are available to assist in this activity; A good project may be the EMA collaborating with providers of in-home safe rooms to outreach to developers. SWCC can be a good partner, due to its building trades program and focus on instruction. |
| Goals addressed | 1, 3, 5 |
| Potential partners | Local governments, EMA, FEMA/IHSEMD, SWCC, private partners |
| Estimated total cost | \$1,000/year |
| Potential key funding sources | Local, State/FEMA, mostly in-kind |
| Benefits (losses avoided) | Engagement of the public, resulting in more mitigation projects |

Purchase road closure barricades.

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incidents |
| Secondary hazard affected | |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | Requires storage and ability to move them to the site. |
| Goals addressed | 1, 2 |
| Potential partners | Local governments; county engineer |
| Estimated total cost | \$5,000 |
| Potential key funding sources | Local, possibly IDOT |
| Benefits (losses avoided) | Prevention of property loss and injuries and possibly death |

Purchase snow trucks, plows, and sanders.

| | |
|-------------------------------|---|
| Primary hazard affected | Transportation incident |
| Secondary hazard affected | Severe winter storm |
| Other key hazards affected | Hazardous materials |
| Jurisdictions implementing | Woodburn |
| Issue/plan for implementation | Requires purchase and proactive maintenance. |
| Goals addressed | 1, 2 |
| Potential partners | Local governments |
| Estimated total cost | \$50,000+ |
| Potential key funding sources | Local, USDA, possibly other federal grants |
| Benefits (losses avoided) | Life safety; continuation of local government |

Purchase stand-by portable pumps and generators.

| | |
|-------------------------------|--|
| Primary hazard affected | Infrastructure failure |
| Secondary hazard affected | Flash flood |
| Other key hazards affected | Hazardous materials, severe winter storm, tornado/windstorm, thunderstorm/lightning/hail |
| Jurisdictions implementing | Murray, Woodburn, Clarke Schools, Murray Schools, SWCC, Clarke County Hospital |
| Issue/plan for implementation | Portability is important but they must be maintained, stored, and easily transported and fueled. Sizing and management priorities should be established. |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, utility providers and infrastructure managers |
| Estimated total cost | \$5,000 each |
| Potential key funding sources | Local, USDA, private and foundation grants, utility partners |
| Benefits (losses avoided) | Life safety; continuation of essential utilities; prevention of property loss |

Purchase, modernize, and/or harden existing mobile and personal first response communications equipment and systems.

| | |
|-------------------------------|--|
| Primary hazard affected | Infrastructure failure |
| Secondary hazard affected | Most other hazards indirectly |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Woodburn |
| Issue/plan for implementation | Communications upgrades is a major issue countywide right now; small town integration into the county’s pending P25 compliant systems is behind schedule |
| Goals addressed | 1, 2, 4, 5 |
| Potential partners | County, State of Iowa. E911 leaders, possibly federal entities |
| Estimated total cost | \$25,000+ for each jurisdiction |
| Potential key funding sources | Local, USDA, FEMA, private and foundation grants |
| Benefits (losses avoided) | Life safety; continuation of essential utilities; prevention of property loss |

Purchase/install backup fixed power generators and pumps.

| | |
|-------------------------------|--|
| Primary hazard affected | Energy failure |
| Secondary hazard affected | Thunderstorm/lightning/hail |
| Other key hazards affected | Tornado/windstorm; severe winter storm |
| Jurisdictions implementing | Murray, Clarke Schools, Murray Schools, SWCC, Clarke County Hospital |
| Issue/plan for implementation | Fixed generators make a building useful for public protection and housing during and after a hazard event. Prioritizes should relate to building use and shelter status. |
| Goals addressed | 1, 2, 5 |
| Potential partners | Local governments, facility owners, EMA |
| Estimated total cost | \$25,000 to \$50,000 |
| Potential key funding sources | Local, FEMA/State, USDA, CDBG, Iowa SRF program, foundation grants, property owners |
| Benefits (losses avoided) | Life safety; basic health; continuation of essential utilities |

Set up incident command process with all other governmental jurisdictions in the county.

| | |
|-------------------------------|---|
| Primary hazard affected | Terrorism |
| Secondary hazard affected | Almost any other hazards |
| Other key hazards affected | |
| Jurisdictions implementing | Clarke County Hospital |
| Issue/plan for implementation | This involves many jurisdictions and is outside of normal activity of hospital. |
| Goals addressed | 1, 2, 3, 4, 5 |
| Potential partners | Local governments, State/FEMA |
| Estimated total cost | Modest to a few thousand dollars |
| Potential key funding sources | Local, State/FEMA in-kind time, possible community foundation grants |
| Benefits (losses avoided) | Life safety; continuity of government |

Store digital and hard copies of public records in low-risk, offsite locations.

| | |
|-------------------------------|--|
| Primary hazard affected | Cyber terrorism |
| Secondary hazard affected | Most hazards that can damage property |
| Other key hazards affected | |
| Jurisdictions implementing | Murray, Woodburn, Clarke Schools, Murray Schools, SWCC |
| Issue/plan for implementation | A significant problem for small towns, because they lack resources to manage data and files in multiple systems; requires long-term resource commitment and oversight. |
| Goals addressed | 2, 5 |
| Potential partners | Local governments, State/FEMA, Iowa Dept. of Management |
| Estimated total cost | \$1,000 initially and \$1,000 per year management and storage |
| Potential key funding sources | Local, State/FEMA in-kind time, possible community foundation grants |
| Benefits (losses avoided) | Prevention of property loss; continuity of government |

Strengthen exposed utility and communications infrastructure.

| | |
|-------------------------------|---|
| Primary hazard affected | Infrastructure failure (energy) |
| Secondary hazard affected | Severe winter storm |
| Other key hazards affected | Thunderstorm/lightning/hail; grass and wildland fire; tornado/windstorm |
| Jurisdictions implementing | Clarke County, Murray, Osceola, Woodburn, Clarke Schools, Murray Schools |
| Issue/plan for implementation | Prioritizes are needed based on supply, population served, voltage, and location. Retrofitting lines is usually less expensive than burial; some high-voltage lines cannot be buried. |
| Goals addressed | 1, 2, 3, 5 |
| Potential partners | Local governments, utility providers, Iowa Utilities Board |
| Estimated total cost | \$1 million (depending on SOW) |
| Potential key funding sources | FEMA/State, local, utility providers, affected property owners, possible USDA |
| Benefits (losses avoided) | Infrastructure preservation; continuation of essential utilities; life safety |

4.11: Implementation of the National Flood Insurance Program (NFIP)

In addition to the strategies outlined in the previous section, the local jurisdictions that are affected by flooding, either identified as Special Flood Hazard Areas (SFHAs) now or in the future, adopts this section as a strategy to address flooding and meet FEMA mitigation planning requirements.

This part of the plan addresses the following Stafford Act requirements:

Section 201.6 (c)(3)(ii): [The mitigation strategy] must also address the jurisdiction’s participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Clarke County Plan Update Changes to the Flood Mitigation

Section 201.6(d)(3) requires that the jurisdictions in the plan review and revise the plan to reflect progress in local mitigation efforts and changes in priorities. Accordingly, this section describes NFIP participation and actions to maintain continued compliance with the NFIP. Section 9.5 in the previous plan addressed this topic.

A primer on floodplain management in Iowa offers insight into how flooding is now mitigated both inside and outside of SFHAs. As part of an effort to stem the increase in flood damages sustained after a number of devastating flood events in the 1940s, the Iowa General Assembly created the Iowa Natural Resources Council in 1949. Originally, the Council's power over floodplain activities was advisory in nature. Its regulatory functions were established by 1957 and 1965 amendments. After a number of state reorganizations, Iowa's floodplain regulatory authority now resides with the Water Resource Section of the Iowa Department of Natural Resources (IDNR). Iowa's floodplain program is different from most states in that its authority extends to virtually all floodplain construction within the state and is not limited to FEMA regulatory floodplains. Regulatory thresholds of rural development in watersheds draining ten square miles or more, and urban developments in watersheds draining two square miles or more require a permit from the IDNR. Other developments below these thresholds have relatively minor impacts and are not considered. Iowa law allows IDNR to delegate the State's floodplain regulatory functions to a local government that has a flood study identifying the regulatory floodway and floodway fringe along the 100-year flood profile and a floodplain management ordinance meeting certain minimum requirements. The state allows communities with delegated floodplain management authority to issue floodplain development permits in lieu of the IDNR. The state has delegated floodplain authority to approximately 140 NFIP participating communities. As part of the delegation process, the state retains the right to concur or deny with the granting of any variance from the community's floodplain management regulations. Although the State of Iowa's criteria for new floodplain development is similar to the minimum NFIP criteria in most respects, there are some important differences, for example:

- The lowest floor of new structures must be elevated an additional 1.0 foot above the 100-year (base) flood.
- Iowa does not allow new residential structures in the floodway.
- Residential structures must have wheeled vehicular access during the 100-year flood.
- The substantial improvement threshold is reached with an additional 25% or more of floor area.
- All post-Firm (Flood Insurance Rate Map) additions are considered cumulative improvements in the determination of increase in flood area.

(Source: FEMA Region VII and IDNR)

Iowa Legislative Code 455B.262A is a law that was enacted in the spring of 2009. The law ties a community's eligibility for certain post-disaster state assistance to participation in the National Flood Insurance Program.

Following a presidentially declared disaster, FEMA makes Public Assistance grants available to local governments. The grants may be used for cleanup and repairs (e.g., assistance for debris removal, infrastructure repair, etc.). These grants usually provide only 75% of the cost of any post-disaster project. The state of Iowa typically contributes another 10% towards the required 25% non-federal match for public assistance grants. Effective July 1, 2011, the State of Iowa made its contribution towards this non-federal match for public assistance grants associated with flood-related disaster declarations contingent upon the community being in good standing with the NFIP.

This code chapter only affects those communities that have an existing Flood Insurance Rate Map (FIRM) published by FEMA that identifies areas within the community that are subject to inundation by flood waters during a 1%-chance flood event (also known as the 100-year flood). If a community is newly identified as having areas that are subject to inundation during a 1%-chance flood event, it will have two

years from the effective date of the FIRM to join the NFIP before the community loses eligibility for state matching funds.

In Chapter 3’s river flood profile is data about local participation and insurance policies. Only the City of Woodburn is participating at this time. Clarke County and Osceola are not participating. One significant development in the past five years is that flood maps have been prepared through the IDNR, Iowa Flood Center, and FEMA’s Risk MAP program. These maps are now regulatory. Appendix D contains the current maps. The following jurisdictions have flood hazards and contain SFHAs:

- Clarke County (rural)
- City of Osceola
- City of Woodburn

Where SFHAs exist and where public demand and interest exists to purchase flood insurance, the jurisdiction(s) will join or continue active participating in the NFIP. As part of the compliance and a proactive mitigation strategy, each jurisdiction will also:

- Adopt and enforce floodplain management requirements, including regulating all and substantially improved construction in Special Flood Hazard Areas (SFHAs).
- Appoint and engage a floodplain manager and readily share information with other jurisdictions.
- Create and enforce the floodplain ordinance. This includes monitoring development in the floodplain and ensuring all development is permitted by the community and the State and ensuring permit applicants have received the required State permit prior to issuing a local permit.
- Continue to review and update the floodplain ordinance. To avoid being sanctioned, the community must amend the ordinance whenever minimum State or NFIP standards are revised and when revised maps are issued.
- Expand public information/education initiatives related to flooding. This includes educating the community about floodplain ordinance requirements, mandatory purchase requirements, and insurance availability. Educating the public about the ordinance requirements and the benefits of complying with those requirements (protecting people and property and making insurance available) helps make certain they are aware of and comply with the ordinance and facilitates enforcement efforts.
- Undertake floodplain identification and mapping, including any local requests for map updates, if needed.
- Coordinate and report insurance claims and loss information.

Mitigation activities in this plan directed toward continued compliance are summarized alphabetically in the following table.

Figure 4.57: Actions that Address NFIP Compliance and Related Flood Issues

| Jurisdictions | Measure/Action | Contribution to Continued Compliance |
|---------------------------|--|--|
| Murray, Osceola, Woodburn | Acquire and demolish or relocate buildings/infrastructure in high-risk areas. | Now that maps are official, efforts to acquire land where structures are likely or already exist may curb future losses. |
| Murray, Osceola | Acquire and use conservation easements and restrictive covenants to prevent development in known hazard areas; preserve open spaces in hazard areas. | Applied to flooding, this can prevent development where pressure is evident but where flooding is likely. |
| Clarke County, Woodburn | Acquire flood prone buildings and convert to open space/green space or elevate to or above base flood elevation or above flash flood reach. | Now that maps are official, efforts to acquire land where structures are likely or already exist may curb future losses. |

| Jurisdictions | Measure/Action | Contribution to Continued Compliance |
|---|--|---|
| Murray, Osceola, Woodburn, Clarke Schools, Murray Schools | Adopt and/or update a full range of local codes and policies to address a range of hazard mitigation issues. | This action can help the jurisdictions identify and codify policy changes that might relate to flooding and the NFIP throughout all codes, policy statements, and ordinances. |
| Clarke County, Murray, Osceola, Woodburn | Bridge and culvert improvements and upsizing. | Damage due to flooding can be minimized with properly sized infrastructure in flood hazard area. |
| Murray, Osceola, Woodburn | Clear and deepen roadside ditches. | Addresses flash flooding and can reduce downstream flooding issues but holding water in place to slow downstream flow. |
| Clarke County | Complete a storm water drainage study for known problem areas. | This data can supplement the FIRM data as well as help with engineering of improvements in those areas. It can also provide information useful to property owners to help them avoid development in hazard areas. |
| Clarke County | Construct or repair dams; develop reservoirs and lakes (flood control, water source). | Can prevent dam failure, which impacts down-stream flooding. |
| Murray, Osceola, Woodburn | Construct storm water drainage (underground, culverts, curb & gutter, etc.); improve capacity of existing systems. | The control and management of storm water in developed areas can prevent downstream flooding. |
| Murray, Woodburn | Elevate, raise grade, or relocate roads, bridges, sewer lift stations, water pumps, and other infrastructure and critical assets. | This project has an indirect impact by reducing the amount of critical infrastructure, necessarily located in the SFHA, subject to river flooding. |
| Murray, Osceola, Woodburn | Encourage/install sustainable storm water control and water quality practices such as buffer strips, bioswales, rain gardens, porous pavement, vegetative buffers, and parking area islands. | This project reduces uphill flash flooding but holding and treating water closer to where it falls, thereby reduces down-stream flooding. |
| Clarke County, Murray, Osceola, Woodburn | Flood proof critical assets in the community. | This project has an indirect impact by protecting buildings and infrastructure, necessarily located in the SFHA but subject to river flooding. |
| Clarke County, Osceola, Woodburn | Implement all aspects of the NFIP. | Joining the NFIP makes the jurisdiction compliant for all FEMA funds. Preparing a valid local floodplain ordinance, continuing to enforce the ordinance for all development in the SFHA, and ensuring applicants for a local permit have received the required state permit, ensure that the community remains compliant and flood insurance is available. At a minimum the ordinance must be amended whenever State or NFIP standards are revised and/or when FEMA issues revised maps. This alternative ensures the community’s floodplain ordinance meets minimum NFIP and state requirements. |
| Osceola, Woodburn | Implement stream modifications, channel improvements and stream bank stabilization. | Not directly an NFIP activity but can prevent flood losses and reduce the extent of flooding in the area of the modifications and downstream. |
| Murray | Install retention and detention structures. | Prevents flooding’s extent and reduces water flow downstream by slowing down the flow of water from a site. |
| Clarke County, Osceola, Woodburn | Maintain sandbags in dry storage. | Protects property from the effects of flooding, but can also exacerbate downstream flooding. |

Flood mitigation is complicated and involves significant funding and planning to be successful. The jurisdictions in the county would be well served to remember that projects, investments, and actions in one area can exacerbate flooding in that area or downhill/downstream from that area, so community project evaluation and policy-making should consider the unintended consequences to flood risk.

4.12: Implementation of Climate Change Resilience Actions

Several mitigation actions in this plan address climate change indirectly, such as improving infrastructure capacity, building retrofits, etc. This section looks at more sustained activities directly related to this issue.

Clarke County Plan Update New Section

In accordance with FEMA Administrator Policy 2011-OPPA-01, where possible, this plan update includes statements on possible mitigation alternatives related to climate change.

The following statements come from the EPA’s “Iowa Climate Change Adaption & Resilience Report, 2011” (p. 19-20). These statements relate to a strategy to address climate change at the local level.

Opportunities for Incorporating Climate Science into Local Planning

Integrating consideration of climate impacts into hazard mitigation and community planning is a relatively new area with no established best practices. The process for considering the impacts of current and future climate changes on hazard mitigation and land planning efforts will vary by community. Options for using climate change information and related estimates of future hazards include:

- **Using information on current and future climate changes in developing risk assessments for hazard mitigation plans.** For example, the city of Ames supplemented its existing Flood Insurance Rate Maps (FIRMs), developed by FEMA, with locally available information to develop improved assessments of flood risk for its hazard mitigation plans. The city conducted an additional floodplain study to accurately determine the boundaries of its 100-year floodplain. Ames’ approach could be taken even further if climate scientists and hydrologists could develop methods for a floodplain study to determine a 100-year floodplain boundary under changed climate conditions.
- **Developing smart planning solutions that reduce risks and enhance community resilience based on an improved understanding of future hazards:** Such solutions might include the development of a greenway to provide flood protection and storage capacity, as well as recreational opportunities; the concentration and/or relocation of existing development out of harm’s way; the identification of safe places to build, which can also be infill areas ripe for reinvestment; and the use of green infrastructure to help manage heavier precipitation. For example, the city of Cedar Falls recently passed legislation that includes a new floodplain ordinance that expands zoning restrictions from the 100-year floodplain to the 500-year floodplain, since this expanded floodplain zone better reflects the flood risks experienced by the city during the 2008 floods. This will help to lessen the damage brought on by future flooding in the community and also discourages further use of fill material in the floodplain, which forces water into areas outside the floodplain.
- **Integrating smart planning solutions into existing planning frameworks:** These solutions can be integrated into existing comprehensive and other land use plans, zoning and building codes and other municipal ordinances, flood maps, and incentives for development and conservation such as the purchase or transfer of development rights, conservation easements, and the establishment of community land trusts.

In the same planning document (p. 34):

“Dr. Kamyar Enshayan, a Cedar Falls, Iowa, city council member and director of the Center for Energy and Environmental Education at the University of Northern Iowa, asserts that whether adaptation is accomplished through hazard mitigation plans or other means, consideration of future changes in climate must become an operational part of local governments, not just a plan that is developed and is disassociated from all other local decisions.”

According to the “*APA Policy Guide on Planning and Climate Change:*”

“Changes in climate due to global warming ultimately will be local in their effects. Changes can occur in the availability of arable land, length of the growing season, amounts of rainfall, temperature changes, levels of disruptive weather, and ecological balance, just to name a few. In addition to research about the implications of climate change for communities and urban areas in general, research is needed that will enable specific places to develop appropriate plans for action to mitigate and adapt to climate change.”

For this reason, the local planning team recognizes that, at this time, creating a full mitigation plan specifically for climate change resiliency is not possible, but the issue will be studied and considered more in future mitigation plan updates.