

3.2 PROJECT IMPLEMENTATION

§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.

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

This portion of the plan builds on the goals and objectives presented in Section 3.1. Each strategy below is listed with a timeframe, primary coordinator, support agencies, potential funding source (and cost estimate), and its current status. Strategies are identified as being one (or more) of eighteen mitigation actions, fourteen of which are from the Ohio EMA's State Hazard Analysis, Resource and Planning Portal (SHARPP). The remaining five are general categories for projects that do not fall into the SHARPP categories.

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| 1. 5% Initiative | 10. Public Education and Awareness |
| 2. Acquisition | 11. Reconstruction |
| 3. Dry Flood Proofing | 12. Relocation |
| 4. Elevation | 13. Retrofit |
| 5. Emergency Services | 14. Soil Stabilization |
| 6. Minor Localized Flood Reduction | 15. Storm Shelter |
| 7. Natural Resource Protection | 16. Storm Water |
| 8. Planning | 17. Training |
| 9. Prevention | 18. Wildfire |

It is important to note that the cost estimates are tentative and meant as a starting point for research on project feasibility. More specifically, these cost estimates are only ranges of probable project costs; all figures are approximations. At the time the implementation of any strategy is considered, a full cost estimate should be sought prior to securing funding. The resources identified are chosen from twelve possible funding sources found in the Ohio EMA's SHARPP database. The funding sources include:



- Community Development Block Grant (CDBG)
- Clean Ohio Grant
- Flood Mitigation Assistance Grant
- Hazard Mitigation Grant Program (HMGP)
- Increased Cost of Compliance
- In-Kind Work (Work or Labor)
- Local Funds
- Pre-Disaster Mitigation Grant (PDM)
- Repetitive Flood Claims Program
- Severe Repetitive Loss Grant
- State Funds
- Other (includes N/A)

The benefit-cost review was emphasized in the prioritization process. Mitigation actions were evaluated by their pros and cons, which are represented as costs and benefits.

Project prioritization occurred during the third Core Committee meeting utilizing the project prioritization matrix. An example of this matrix can be found in the appendix. Committee members were asked to rate each project on six criteria using a one to five scale where five is best. The criteria used are:

- Ease of Implementation
- Cost Effectiveness
- Social Impacts
- Political Impacts
- Economic Impacts
- Overall Positive Impact

The highest score that a proposed project could attain would be a 30 and the lowest would be a six. To assign priorities, the average of total scores for each project was found as was the standard deviation. The project with the highest average received the highest priority ranking, with the rest following by average. In the case where the averages were the same, the standard deviation was used to determine priority. A lower standard deviation is statistically indicative that the scores were less dispersed. The project with a lower standard deviation has more consensus among committee members as to its rank than the project with a higher standard deviation.

Eleven core committee members were present and completed the project prioritization matrix. One of these was not completely filled out with one criteria being left blank across every project. This incomplete matrix was not included in the analysis due to the impact these lower numbers would have on the averages. The project prioritization instructions used to calculate the results can be found in Appendix 1. The prioritized project list is shown in the table below. A



list of projects that were deleted by the committee and of projects that have been completed within the planning cycle can be found in Appendix 4.

2005-2016 MITIGATION STRATEGY PROGRESS

Washington County, and the jurisdictions contained within the county, have made progress in the implementation of this plan within the prior updating cycle. Priorities, however, have undergone changes during the updating cycle. Some mitigation project were completed that were in the prior iteration of the plan, while others were identified after plan adoption in response to hazard events.

Washington County, as well as a number of the municipalities, have completed buyouts of flood prone properties. According to the Ohio EMA's SHARPP data, twelve homes and vacant lots have been bought in the county, one home was bought in Lower Salem and two homes were bought in Macksburg.

An additional mitigation project that was included in the prior plan iteration and was completed during the plan cycle is the installation of rain gauges around the county to provide adequate warnings of possible flooding. These gauges were placed in strategic locations around the county and along the Muskingum River in the Village of Lowell.

As outlined in the 2005 plan, the county has reviewed and updated floodplain maps on a regular basis and has encouraged cooperation between watershed groups to identify flood prone areas. Waterways have been dragged/cleaned, and this activity will continue in the updated plan cycle.

The City of Marietta, in collaboration with Buckeye Hills – Hocking Valley Regional Development District, developed a “Marietta Flood Impacts” web application. The application shows what parcels will be impacted at various flood stages as measured by the gauge installed at the confluence of the Ohio and Muskingum rivers. (<http://bhgis.org/marietta/floodimpacts/>)

To improve communication with residents both during hazard events and day to day operations, the WCEMA completed a mass notification project that was not included in the prior iteration of the plan. The WCEMA obtained a subscription to the Everbridge mass notification system and has been aggressively encouraging residents of the county to enroll for notifications. The results of this effort are evidenced in the Washington County Risk Assessment Survey. Of the 102 participants who answered the question “Are you subscribed to receive alerts from Washington County?” over 70% answered yes. The success of the Everbridge notification program has led to its inclusion in a number of new and on-going mitigation projects in the 2016 plan update.

Two other communication/notification projects were completed in the planning cycle. The first consisted of the implementing of a reverse 911 system to warn residents in the event of a hazardous event. This type of system allows for targeted warnings based on the address associated with the landline. The second communications project consisted of establishing a communications system that allows all emergency responders to communicate with each other during large scale events.



Washington County Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Washington 1	Severe Weather	1	Continue to utilize and expand the Everbridge notification system for severe weather alerts	July 1, 2016- June 30, 2021	Washington County EMA, Director	Public Education and Awareness	No additional funding	Local Funding
Status: New. This is a consolidation of various notification projects in the prior version of the plan.								
Washington 2	Tornados	2	Coordinate with the National Weather Service (NWS) to warn residents of impending possible tornado conditions.	July 1, 2016- October 31, 2016	Washington County EMA, Director ; NWS Representative	Public Education and Awareness	No additional funding	Local Funding
Status: Ongoing. Everbridge notifications include tornado warnings.								
Washington 3	Miscellaneous Hazards	3	Continuously review past plans, such as those from the 1960's, and the strategies for lessening the effects of various hazards in them to generate ideas to incorporate into current planning processes.	July 1, 2016- June 30, 2021	Washington County Commissioners, Washington County EMA, Director	Planning, Prevention	No additional funding	Local Funding
Status: On-going								
Washington 4	Miscellaneous Hazards	4	Provide potential shelter sites with generators that will allow them to remain operational during emergency situations.	July 1, 2016- October 31, 2016	Washington County EMA, Director	Storm Shelter	\$1,000 - \$1,500 per site	Local Funding, PDM
Status: On-going, pending funding.								



Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Washington 5	Extreme Temperatures	5	Identify potential warming/cooling centers as well as potential partners to operate centers	July 1, 2016- June 30, 2021	Washington County EMA, Director	Storm Shelter	No additional funding	Local Funding
Status: New								
Washington 6	Tornados	6	Coordinate the purchase and strategic installation of warning sirens and/or coordinate the use of existing fire department sirens	July 1, 2016 - June 30, 2018	Washington County EMA, Director	Public Education and Awareness	Up to \$5,000 per siren	PDM, Local Funding
Status: On-going								
Washington 7	Miscellaneous Hazards	7	Develop informational brochures and flyers to educate residents on the various hazards faced in Washington County	July 1, 2016- June 30, 2021	Washington County EMA, Director	Public Education and Awareness	\$3,000 - \$5,000 per hazard	Local Funds
Status: New. This is a consolidation of the various informational projects in the prior version of the plan.								
Washington 8	Drought	8	Coordinate tentative contracts or agreements with water hauling companies to have emergency supplies hauled into Washington County.	July 1, 2016 - June 30, 2018	County Commissioners	Planning, Emergency Services	No additional funding	Local Funds
Status: On-going. A list has been compiled, but MOUs have not been written. Less need as public water services expand in the county.								
Washington 9	Earthquake	9	Coordinate with ODNR on information about seismic activity in Washington County	July 1, 2016- June 30, 2021	Washington County EMA, Director	Public Education and Awareness	No additional funding	Local Funds
Status: New								



Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Washington 10	Mass Movement	10	Coordinate with relevant agencies to undertake reclamation projects as events occur/problems are identified	July 1, 2016- June 30, 2021	Ohio Department of Natural Resources (ODNR), Representative	Reconstruction, Prevention	Up to \$2,000,000	ODNR, Local Funds
Status: On-going.								
Washington 11	Flooding	11	Install shut off valves on the county's water lines to prevent back flow during times of elevated water levels.	July 1, 2016- June 30, 2017	Washington County Sewer and Water Conservation District, County Engineer, County Commissioners	Prevention, Property Protection, Storm Water	Up to \$10,000	Local Funds
Status: On-going, completed in some areas.								
Washington 12	Dam Failure	12	Coordinate with ODNR, USACOE, and dam owners	July 1, 2016- October 31, 2016	ODNR Representative, USACOE Representative	Planning, Prevention	No additional cost	N/A
Status: On-going. Washington County EMA has had meetings with, and received EAPs from, some facilities								
Washington 14	Flooding	13	Coordinate with local officials to identify and conduct acquisition and relocation projects in flood-prone portions of the county.	July 1, 2016 - June 30, 2018	Washington County EMA Director, County Commissioners	Acquisition, Relocation	Average of \$80,400 per house	HMGP
Status: On-going. There have been 15 buyouts according to SHARPP data. These have occurred in Lower Salem (1), Macksburg (2) and in unincorporated Washington County (12)								
Washington 15	Flooding	14	Consider building dry dams, dikes, and retention ponds to retain floodwaters	July 1, 2016- June 30, 2021	USACOE, Watershed Groups, County Engineer	Dry Flood Proofing, Storm Water, Prevention	\$500,000 - \$ 1 Million per project	Flood Control Act funding, Local funding
Status: On-going. Storm water program								



City of Belpre Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Belpre 1	Flooding	1	Evaluate options to reduce the amount of impermeable ground coverage in upland and drainage areas near the City of Belpre.	July 1, 2016 – June 30, 2018	City Council Members	Prevention, Storm Water	No additional funding	Local Funds
Status: On-Going								
Belpre 2	Flooding	2	Install a valve system throughout the city to prevent water accumulation in low lying areas.	July 1, 2016 – June 30, 2018	City Council Members, Safety Service Director	Minor Localized Flood Reduction, Prevention, Storm Water	\$150,000 - \$200,000	HMGP, CDBG
Status: On-Going								
Belpre 3	Flooding	3	Install flow monitors on wastewater pipes	July 1, 2016 – June 30, 2021	City Council Members, Safety Service Director	Storm Water, Prevention Property Protection	Up to \$10,000	Local Funds
Status: New								

Village of Beverly Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Beverly 1	Flooding	1	Improve the village's drainage system to better accommodate storm water runoff in residential and commercial areas.	July 1, 2016 – June 30, 2021	Village Council Members	Storm Water, Prevention	Up to \$1 Million	CDBG, USEPA
Status: Deferred, awaiting funding.								



Village of Lowell Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Lowell 1	Flooding	1	Clean Debris From Dam And Canal Area	July 1, 2016 – June 30, 2019	Village Council Members, ODNR Representative	Prevention, Property Protection	\$225,000	ODNR, Local, FEMA
Status: New								

Village of Lower Salem Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Lower Salem 1	Flooding	1	Remove existing structures in floodplains that have been identified as repetitive loss structures	July 1, 2016 – June 30, 2021	Village Council Members	Acquisition	Up to \$250,000	FEMA/Local
Status: New								
Lower Salem 2	Flooding	2	Identify a high ground area above the flood plain for residents in low lying areas to seek safety in the event of a flood	July 1, 2016 – June 30, 2021	Village Council Members, Washington County EMA, Director	Planning, Public Education and Awareness, Storm Shelter	No additional funding	Local Funding
Status: New								



Village of Macksburg Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Macksburg 1	Flooding	1	Ensure proper bank stabilization by planting vegetation on slopes, creation of terraces on hillsides, use of riprap boulders and geo-textile fabric where appropriate, etc.	July 1, 2016 – June 30, 2019	Village Council Members	Natural Resource Protection, Soil Stabilization	Up to \$50,000	Local funding
Status: On-Going								
Macksburg 2	Flooding	2	Remove existing structures in floodplains that have been identified as repetitive loss structures	July 1, 2016 – June 30, 2021	Village Council Members	Acquisition	Up To \$250,000	FEMA/Local
Status: New								
Macksburg 3	Flooding	3	Examine possible improvements to storm water system.	July 1, 2016 – June 30, 2021	Village Council Members	Storm Water	No additional funding	Local Funding
Status: New								



City of Marietta Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mit. Type	Est. Cost	Resources
Marietta 1	Flooding	1	Maximize the benefit of a new state-of-the-art Early Flood Warning System by linking it with the new EverBridge Mass Notification System	July 1, 2016 – June 30, 2017	City Engineer, Washington County EMA, Director, Washington County Flood Plain Coordinator	Public Education & Awareness	No Additional Funding	Local Funding
<p>Status: New. The City has made significant progress on creating a State of the Art Early Flood Warning System valued at over \$500,000! The City worked with USGS, USACE, National Weather Service and MWCD to complete this work. The No. 1 Priority for the City is to implement and tie this system to the new Everbridge Mass Notification System jointly being implemented by Washington County EMA and the City of Marietta. The City will need to establish and program Flood Inundation Maps that are sent out via e-mail and posted on appropriate websites to quickly and efficiently communicate to all property owners and concerned citizens of impending floods based on the Hydraulic Models created by this project at the confluence of the Muskingum and Ohio Rivers.</p>								
Marietta 2	Flooding	2	Assess the feasibility of conducting structural projects, such as diking or elevation, to alleviate flood damage to the city's Wastewater Treatment Plant and water wells, both of which lie in the floodplain.	July 1, 2016 – June 30, 2017	City Council Members, USACOE Representative, County Engineer	Prevention	No additional funding	Local Funding
<p>Status: On-going. The City has completed Engineering and will be soliciting bids for the WWTP Phase 3 Project which has incorporated improvement to elevate and protect equipment at the City's Wastewater Treatment Plant.</p>								
Marietta 3	Flooding	3	Conduct acquisition and relocation of identified parcels throughout the city.	July 1, 2016 – June 30, 2021	City Council Members	Acquisition	Approx. \$960,000	HMGP
<p>Status: On-going. This needs focused attention and effort from City Administration to identify and prioritize properties that would qualify for funding. No significant progress has been made to date.</p>								
Marietta 4	Flooding	4	Install a valve system to prevent water backup near Buckeye Park	July 1, 2016 – June 30, 2019	City Engineer	Minor Localized Flood Reduction, Stormwater	Up to \$100,000	HMGP, CDBG
<p>Status: On-going. The City has investigated and attempted to apply for funding for this project but has been unsuccessful up to this point in time.</p>								
Marietta 5	Flooding	5	Clean portions of Duck Creek to remove debris such as trees, log jams, and sediment bars.	July 1, 2016 – June 30, 2021	USACOE Representative, City Engineer	Prevention	\$50,000 - \$100,000	USACOE, Local Funding
<p>Status: On-going. Some efforts from City Streets Department has occurred but more work is needed on a regular scheduled cycle or basis.</p>								



Village of New Matamoras Projects

Project #	Hazard	Project Priority	Strategy	Timeframe	Primary Coord.	Mitigation Type	Est. Cost	Resources
Matamoras 1	Flooding	1	Conduct acquisition and relocation projects in portions of the village.	July 1, 2016 – June 30, 2021	Village Council Members	Acquisition, Relocation	Approx. \$80,000 per structure	HMGP
Status: Ongoing								
Matamoras 2	Flooding	2	Establish a flood evacuation route.	July 1, 2016 – June 30, 2021	Village Council Members, ODOT Representative, Sheriff's Office Representative	Planning, Public Education and Awareness	\$300,000 - \$500,000	Local funding, PDM, ODOT
Status: New								
Matamoras 3	Flooding	3	Undertake projects to enhance the capacity of existing drainage systems in the village.	July 1, 2016 – June 30, 2021	Village Council Members	Structural Projects	Up to \$1 Million	CDBG, EPA
Status: Ongoing								

