

## SECTION 6: MITIGATION STRATEGY

This section describes the process by which the Lehigh Valley Steering Committee and municipal planning partnership performed the update to the county and local mitigation strategies. This update focused on improving the county and local mitigation strategies, and so addressed the updating of mitigation strategies from the outset of the planning process. Throughout the planning process, both counties and all municipalities were encouraged to thoroughly consider their natural and non-natural hazard risks and vulnerabilities, and to identify appropriate projects or initiatives to mitigate those risks.

This section includes:

- (1) Review and Update of Hazard Mitigation Goals
- (2) Update of Municipal Mitigation Strategies
- (3) Update of County-Level Mitigation Strategies
- (4) Mitigation Strategy Prioritization and Implementation

### 6.1 Review and Update of Hazard Mitigation Goals

As part of the plan update process, the Steering Committee and all participating municipalities were tasked with review of the hazard mitigation planning goals identified in the 2006 plan. Steering Committee members were tasked with this review at the outset of the process, as part of an overall review of the 2006 plan and associated FEMA plan review crosswalk to determine those areas that needed specific updating. To facilitate the municipal review process, a mitigation planning Goals Review Worksheet was developed and distributed to all participating municipalities. This worksheet, based on the Goal and Objective Review Worksheet sample provided in Appendix 8 of Pennsylvania's All-Hazard Planning Standard Operating Guide (October 2010), further included a description and purpose of hazard mitigation planning goals and objectives, the need for these goals to complement and support the goals of other associated state, regional and local planning mechanisms, and identified the mitigation goals in the Commonwealth of Pennsylvania Standard 2010 All-Hazard Mitigation Plan.

While conducting the review process, participating municipalities were asked to consider the following questions:

- Do the goals identified in the previously approved plan reflect the updated risk assessment?
- Did the goals identified in the previously approved plan lead to mitigation projects and/or changes in policy that helped the jurisdiction(s) to reduce vulnerability?
- Do the goals identified in the previously approved plan support any changes in mitigation priorities?
- Are goals identified in the updated Local Mitigation Plan reflective of current State goals?

For each goal in the 2006 plan, the worksheet asked the respondent to indicate:

- Keep/Still Applies (Yes/No, if "No", then indicate reason)
- Modify as Follows
- Supported Local Risk Reduction (Yes/No)

Further, respondents were provided the opportunity to identify new/additional goals and/or objectives. Completed worksheets submitted by the municipalities may be found in Appendix D.

Throughout the planning process, the relevance of the original goals continued to be evaluated for possible amendment based on input from the counties and municipalities; a consideration of the updated risk assessment results; review of relevant authorities, policies, and programs; and alignment with the mitigation goals in the Commonwealth of Pennsylvania Standard 2010 All-Hazard Mitigation Plan, identified as:

1. Protect lives, property, environmental quality, and resources of the Commonwealth, including Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties.
2. Enhance consistent coordination, collaboration, and communications among stakeholders.
3. Provide a framework for active hazard mitigation planning and implementation.
4. Build legislative support and secure funding for mitigation efforts.
5. Increase awareness, understanding, and preparedness across all sectors.

Subsequent to this review process, the goals of the 2006 plan remain unchanged, with the exception of the addition of “non-natural hazards” (noted in brackets below), as they were found to embody the overarching needs and concerns of the counties and participating municipalities in addressing natural and non-natural hazard risk reduction, and are in-line with the State mitigation goals.

Goal 1: To minimize the risk to human life associated with natural [and non-natural] hazards.

Goal 2: To promote hazard avoidance, especially in floodplains, by removing high-risk and repetitive loss structures and through restrictions on future development.

Goal 3: To reduce the damages from natural [and non-natural] hazards to existing and future public and private assets including structures, critical facilities and infrastructure.

Goal 4: To protect and restore existing natural resources including wetlands, floodplains and riparian buffers.

Goal 5: To develop, prioritize and implement cost-effective, long term actions that will reduce the impacts of natural [and non-natural] hazards.

Goal 6: To recommend local regulations to reduce the impacts of natural [and non-natural] hazards.

Goal 7: To enhance planning and emergency response efforts among federal, state, county and local emergency management personnel to protect public health and safety.

Goal 8: To promote public awareness on both the potential impacts of natural [and non-natural] hazards and actions to reduce those impacts.

## 6.2 Update of Municipal Mitigation Strategies

In the 2006 Lehigh Valley HMP, participating municipalities were asked to identify mitigation projects within their communities. In Lehigh County, 10 municipalities recommended a total 103 projects, while in Northampton County, 26 municipalities recommended a total of 106 projects.

To evaluate progress on local mitigation actions, each community with actions in the 2006 plan was provided with a Mitigation Action Plan Review Worksheet, based on the Action Plan Review Worksheet sample provided in Appendix 8 of Pennsylvania's All-Hazard Planning Standard Operating Guide (October 2010). Each municipal worksheet was pre-populated with those actions identified for their community in the 2006 plan. For each action, the respondents were asked to indicate the status of each action ("No Progress/Unknown", "In Progress/Not Yet Complete", "Continuous", "Completed", "Discontinued"), and provide review comments on each.

Completed Mitigation Action Plan Review Worksheets submitted by the municipalities may be found in Appendix D. Local mitigation actions identified as "Complete", as well as certain "Continuous" (ongoing) actions, are identified in the jurisdictional annexes found in Section 9, Table F1, of this plan. Actions identified as "Discontinued" have been removed from this plan update.

Those local actions that municipalities identified as "No Progress/Unknown", "In Progress/Not Yet Complete" or "Continuous" have been carried forward in their local updated mitigation strategy identified in the jurisdictional annexes found in Section 9, Table F3, of this plan update. Municipalities were asked to provide further details on these projects to help better define the projects, identify benefits and costs, and improve implementation, and were provided with a "Mitigation Project Capture Worksheet" to help survey communities for this information.

At the Kick-Off and subsequent planning meetings, all participating municipalities were provided a survey ("Municipal Information Worksheet") to further assist in identifying mitigation activities completed, ongoing and potential/proposed. Completed Municipal Information Worksheets submitted by the municipalities may be found in Appendix D.

As new additional potential mitigation actions, projects or initiatives became evident during the plan update process, including as part of the risk assessment update and as identified through the public and stakeholder outreach process (see Section 3), communities were made aware of these either through direct communication (email, phone) or via their draft municipal annexes.

As ongoing or uncompleted activities from the 2006 plan, or potential new initiatives were identified, municipalities were provided with "Project Capture Worksheets" to facilitate the gathering of additional information on each potential project, including additional project description, estimated cost, potential benefits, responsible agency/department, and timeline.

### **Jurisdictional Annexes:**

A major change in the format of this plan update was the incorporation of jurisdictional annexes. Each jurisdiction participating in this update (both counties and all municipalities) has assisted in the authoring of their own annex or chapter to this plan update, included in Section 9. One of the key elements of each annex is the updated jurisdictional mitigation strategy.

Each municipality was asked to attend at least one of the three Jurisdictional Annex Workshops held during April and May, 2012. At these workshops, municipalities were provided with their draft annex,

annex completion instructions, and various resources to assist and support the development of their annexes including:

- Electronic copies of the updated draft hazard profiles.
- Mitigation Strategy Ideas (organized by hazard) excerpted from Appendix 10 of Pennsylvania's All-Hazard Planning Standard Operating Guide (October 2010).
- Excerpts of the relevant Act 167 Stormwater Management Plan covering their community, specifically those sections pertaining to existing storm drainage problem areas, significant obstructions, and existing and proposed flood control projects.

To help support the selection of an appropriate, risk-based mitigation strategy, each annex provided a summary of hazard vulnerabilities identified during the plan update process, either directly by municipal representatives, through review of available county and local plans and reports, and through the hazard profiling and vulnerability assessment process.

Annexes were pre-populated with both specific mitigation actions identified during the course of the plan update, as well as general (“common”) initiatives developed during the planning process and included for municipal consideration.

Specific mitigation actions included in the draft municipal annexes included:

- Those being carried forward from the 2006 plan;
- Those specifically identified by the jurisdiction during the course of the planning process;
- Those identified in other relevant county and local plans and reports (e.g. Act 167 Stormwater Management Plans, Capital Plans, local engineering studies);
- Those identified during the public and stakeholder outreach process, including the Stakeholder Outreach Workshops (see Section 3);
- Those that became evident through the updated hazard profiling and risk/vulnerability assessment effort.

Each draft jurisdictional annex was also pre-populated with a suite of “general” or “common” mitigation initiatives for their consideration and inclusion as appropriate. Throughout the plan update process, and in consideration of federal and state mitigation guidance, the Steering Committee recognized that all municipalities would benefit from the inclusion of certain mitigation initiatives. These include initiatives to address vulnerable public and private properties, including RL and SRL properties; initiatives to support continued and enhanced participation in the NFIP; improved public education and awareness programs; initiatives to build greater local mitigation capabilities; and a commitment to implement and maintain the plan.

All municipalities were asked to thoroughly review these “general” initiatives, and include, amend or delete them as they found appropriate for their jurisdiction.

From May through September 2012, members of the Steering Committee and contract consultant worked directly with each jurisdiction (phone, email, local support meetings) to assist with the development and update of their annex and include mitigation strategies, focusing on identifying well-defined, implementable projects with a careful consideration of benefits (risk reduction, losses avoided), costs, and possible funding sources (including mitigation grant programs).

Further, concerted efforts were made to assure that municipalities develop updated mitigation strategies that included activities and initiatives covering the range of mitigation action types described in FEMA guidance (FEMA 386-3), including:

- 1. Prevention:** Government, administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- 2. Property Protection:** Actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- 3. Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- 4. Natural Resource Protection:** Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- 5. Emergency Services:** Actions that protect people and property, during and immediately following, a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.
- 6. Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.

### 6.3 Update of County-Level Mitigation Strategies

In the 2006 Lehigh Valley HMP, Lehigh and Northampton counties identified fifteen (15) county-level actions/initiatives to support an improved understanding of hazard risk and vulnerability, and enhance mitigation capabilities. Progress on the 2006 county-level mitigation actions was evaluated during the 2008 formal plan review, and again during this update process.

The update of the county-level mitigation strategies included a review of progress on the actions/initiatives identified in the 2006 HMP, using a process similar to that used to review municipal mitigation strategy progress. Both counties and the LVPC, via their various representatives on the Steering Committee, were provided with a Mitigation Action Plan Review Worksheet identifying all of the county-level actions/initiatives from the 2006 plan, including any progress as identified in the 2008 Progress Report. For each action, the respondents were asked to indicate the status of each action (“No Progress/Unknown”, “In Progress/Not Yet Complete”, “Continuous”, “Completed”, “Discontinued”), and provide review comments on each.

Completed Mitigation Action Plan Review Worksheets submitted by both counties are provided in Appendix D. Projects/initiatives identified as “Complete”, as well as certain “Continuous” (ongoing)

actions, are identified in subsection F1 of the county annexes found in Section 9 of this plan update. Actions identified as “Discontinued” have been removed from this plan update. Those actions the counties have identified as “No Progress/Unknown”, “In Progress/Not Yet Complete” or “Continuous” have been carried forward in the updated mitigation strategies identified in Table F3 of the county annexes found in Section 9 of this plan update.

Throughout the course of the plan update process, additional regional and county-level mitigation actions have been identified. These were identified through:

- Review of the results and findings of the updated risk assessment;
- Review of available regional and county plans, reports and studies;
- Direct input from regional and county agencies, including emergency services, public works/facilities, health/human services, and community and economic development;
- Input received through the stakeholder outreach process, including the Stakeholder Outreach Workshops.

## 6.4 Mitigation Strategy Prioritization and Implementation

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. This allows the jurisdictions to select the most cost-effective actions for implementation first, not only to use resources efficiently, but to make a realistic start toward mitigating risks.

Mitigation benefits are future damages and losses that would be eliminated and/or reduced by implementing the proposed mitigation project, and include physical damage to structures and infrastructure, loss of service or function, emergency management costs, etc. Particularly for physical (“shovel-in-the-ground”) mitigation projects, jurisdictions were encouraged to identify and/or estimate both project costs as well as anticipated benefits. Where exact project benefits and costs were not available, ranges were identified (high, medium, low) for each allowing at least a qualitative evaluation of project cost-effectiveness.

Municipal and county-level mitigation actions were evaluated and prioritized primarily using the PA STEEL methodology defined in Pennsylvania’s All-Hazard Planning Standard Operating Guide (October 2010), pages 36-37 and Appendix 12, “Mitigation Strategy Action Evaluation”. Each jurisdictional annex in Section 9 contains a completed PA STEEL action evaluation table (Table G) for those actions identified in their updated mitigation strategies (Table F.3).

The PA STEEL methodology provides a uniform approach the counties and jurisdictions can use to consider, in a systematic way, the **Political, Administrative, Social, Technical, Economic, Environmental, and Legal** (PA STEEL) opportunities and constraints of implementing a particular mitigation action in your jurisdiction. The following provides a brief discussion of each of the PA STEEL evaluation criteria, excerpted from the FEMA 386 mitigation planning guidance:

**Political:** Understanding how your current community and state political leadership feels about issues related to the environment, economic development, safety, and emergency management will provide valuable insight into the level of political support you will have for mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability.

**Administrative:** Under this part of the evaluation criteria, you will examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine if the jurisdiction has the

personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.

**Social:** The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of community acceptance.

**Technical:** It is important to determine if the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Here, you will determine whether the alternative action is a whole or partial solution, or not a solution at all.

**Economic:** Every local, state, and tribal government experiences budget constraints at one time or another. Cost-effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. States and local communities with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources. “Big ticket” mitigation actions, such as large-scale acquisition and relocation, are often considered for implementation in a post-disaster scenario when additional federal and state funding for mitigation is available. Economic considerations must include the present economic base and projected growth.

**Environmental:** Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as the National Environmental Policy Act (NEPA), to keep in mind when using federal funds. You will need to evaluate whether, when implementing mitigation actions, there would be negative consequences to environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.

**Legal:** Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, you will determine whether your jurisdiction has the legal authority at the state, tribal, or local level to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities. You should identify the unit of government undertaking the mitigation action, and include an analysis of the interrelationships between local, regional, state, and federal governments. Legal authority is likely to have a significant role later in the process when your state, tribe, or community will have to determine how mitigation activities can best be carried out, and to what extent mitigation policies and programs can be enforced.

Per the PEMA SOG, the mitigation strategy evaluation through the PA STEEL methodology also summarizes the feasibility factors for each action and summarizes the factors with benefits and costs weighed more heavily and, therefore given greater priority. Using cost-benefit weighted prioritization, mitigation actions which receive twenty or more favorable ratings are considered high priority actions. Mitigation actions which receive six or more unfavorable ratings are expected to be more difficult to accomplish compared to other mitigation actions. These are not considered low priority, particularly since they will likely need more attention than other actions. However, barriers to implementation including political, financial, time, etc., increase their costs and therefore reduce overall benefits.

However, other factors beyond the PA STEEL numeric rankings may have been considered during project prioritization. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant.

The annexes in Section 9, Volume II of this plan update present the updated mitigation strategies identified by both counties and all participating municipalities, including:

- Mitigation actions for individual and multiple hazards;
- Identification of the mitigation action type;
- Department or agency primarily responsible for project initiation and/or implementation;
- Estimated cost for the mitigation action, and identification of known or potential sources of funding;
- Implementation schedule;
- Implementation priority.

Specific mitigation actions were identified to prevent future losses; however, current funding is not identified for all of these actions at present. The two counties and participating municipalities in the Lehigh Valley have limited resources to take on new responsibilities or projects. The implementation of these mitigation actions is dependent on the approval of the local elected governing body and the ability of the jurisdiction to obtain funding from local or outside sources.

In general, mitigation actions ranked as high priorities will be addressed first. However, medium or even low priority mitigation actions will be considered for concurrent implementation. Therefore, the ranking levels should be considered as a first-cut, preliminary ranking and will evolve based on prevailing priorities and decisions of local governments, the public, PEMA and FEMA as the plan update is implemented.

**Plan revisions to reflect changes in priorities (FEMA Requirement 201.6(d)(3):**

Prioritization in the 2006 plan was limited to flood projects, using a High, Medium, Low system as follows:

- High Priority: Public Infrastructure/Critical Facilities
- Medium Priority: Acquisitions and Floodproofing/Elevation
- Low Priority: Storm Drainage Improvements

As detailed above, the 2013 update has added the PA STEEL criteria to help enhance the prioritization of projects, particularly new projects identified during the update process. In general, the prioritization of 2006 flood projects being carried forward into this update has remained the same, as the prioritization system used for flood projects in the 2006 plan is still believed to be valid for the two counties and the inclusive municipalities. However, the PA STEEL criteria has been applied by plan participants to all projects in this update (Table F3 in each annex), allowing a broader range of prioritization criteria to be applied including technological, social, environmental and economic criteria. Changes in priorities by the participating jurisdictions have been accommodated through the addition of the PA STEEL criteria to the 2006 prioritization system.

Further, the mitigation goals established in the 2006 plan were reviewed by the Steering Committee, and were determined to remain valid with minor modifications (the addition of “non-natural hazards”). As such they continue to reflect the overarching priorities driving mitigation in the Lehigh Valley.