



1 INTRODUCTION AND PLANNING PROCESS

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1.1 Purpose

Polk County and the participating cities, public school districts, and Des Moines Water Works prepared this Multi-jurisdictional Hazard Mitigation Plan update to guide hazard mitigation planning to better protect the people and property of the planning area from the effects of hazard events.

This plan demonstrates the jurisdiction’s commitments to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Polk County and the participating jurisdictions eligible for certain federal grant programs; specifically, the Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Assistance (HMA) grants such as the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program.

1.2 Background and Scope

Each year in the United States, disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as “any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event.” The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. Polk County and the incorporated areas that participated in this plan update developed a Multi-jurisdictional Hazard Mitigation Plan that was approved by FEMA on July 14, 2009 (hereafter referred to as the *2009 Polk County Hazard Mitigation Plan*). Therefore, this current planning effort serves to update the previous plan.

This plan documents the hazard mitigation planning process undertaken by the Polk County Hazard Mitigation Planning Committee (HMPC). It identifies relevant hazards and vulnerabilities in the planning area and sets forth an updated mitigation strategy to decrease vulnerability and increase resiliency and sustainability in Polk County.

The Polk County Multi-jurisdictional Hazard Mitigation Plan is a multi-jurisdictional plan that geographically covers the participating jurisdictions within Polk County's boundaries (hereinafter referred to as the planning area). The following jurisdictions officially participated in the planning process:

- Unincorporated Polk County
- City of Alleman
- City of Altoona
- City of Ankeny
- City of Bondurant
- City of Clive
- City of Des Moines
- City of Elkhart
- City of Grimes
- City of Johnston
- City of Mitchellville
- City of Pleasant Hill
- City of Polk City
- City of Runnells
- City of Urbandale
- City of West Des Moines
- City of Windsor Heights
- Des Moines Water Works
- Ankeny School District 261
- Bondurant-Farrar School District 720
- Dallas Center-Grimes School District 1576
- Des Moines Independent School District 1737
- Johnston School District 3231
- North Polk School District 4779
- Southeast Polk School District 6101
- Urbandale School District 6579
- West Des Moines School District

There are several cities within Polk County that have portions of their city limits in adjacent counties. These cities are treated in one of two ways for purposes of participation in this plan:

1) Official Plan Participants: The following cities are bi-county/multiple-county cities that are either a part of the Des Moines Metro Area that have portions of their city limits in other counties, or cities that have the majority of their corporate limits in Polk County. These cities will be invited as official plan participants in the Polk County plan. The Risk Assessment will include incorporation of analysis of building exposure/critical facilities of the entire city limits for these jurisdictions:

- Clive-parts in Dallas County,
- Urbandale-parts in Dallas County,
- West Des Moines-parts in Dallas County, Madison County, & Warren County,
- Grimes-parts in Dallas County,
- Des Moines-parts in Warren County, and
- Mitchellville-parts in Jasper County.

2) Stakeholder Participants: To provide a comprehensive analysis, the Risk Assessment includes incorporated areas of several cities that have a portion of their city limits in Polk County, but are considered official cities of adjacent counties. The Risk Assessment will include analysis of building exposure/critical facilities ONLY for those portions of the incorporated areas that are within the Polk County boundary. Although these cities are not official participants of the Polk County Multi-jurisdictional Hazard Mitigation Plan, they are stakeholders in the planning process and as such, were invited to planning meetings and to comment on plan drafts.

- Carlisle-parts in Warren County,
- Granger-parts in Dallas County,
- Norwalk-parts in Warren County, and
- Sheldahl-parts in Story County & Boone County.

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act.) While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Polk County planning area has been affected by hazards in the

past and the participating jurisdictions are therefore committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

1.3 Plan Organization

This Polk County Multi-jurisdictional Hazard Mitigation Plan update is organized as follows:

- Executive Summary, Special Thanks and Acknowledgements, Table of Contents, Prerequisites
- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

This is the same general format that was used for the 2009 Multi-jurisdictional Polk County Hazard Mitigation Plan.

1.4 Planning Process

44 CFR Requirement 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

In June 2013, Polk County contracted with AMEC Environment & Infrastructure, Inc. (AMEC) to facilitate the update of the multi-jurisdictional, local hazard mitigation plan. AMEC's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA),
- Ensure the updated plan meets the DMA requirements as established by federal regulations and following FEMA's planning guidance,
- Facilitate the entire planning process,
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in facilitating the public input process,
- Produce the draft and final plan update documents, and
- Coordinate the Iowa Homeland Security and Emergency Management Division and FEMA plan reviews.

1.4.1 Multi-Jurisdictional Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Polk County Emergency Management invited the incorporated cities, public school districts, Des Moines Water Works, and various other stakeholders in mitigation planning (identified in Appendix B) to participate in the Polk County Multi-jurisdictional Hazard Mitigation Plan update

process. The jurisdictions that elected to participate in this plan are listed above in section 1.2. The DMA requires that each jurisdiction participate in the planning process must officially adopt the multi-jurisdictional hazard mitigation plan. Each jurisdiction that chose to participate in the planning process and development of the plan was required to meet plan participation requirements defined at the first planning meeting, which includes the following:

- Designate a representative to serve on the HMPC;
- Participate in at least one of three HMPC meetings by either direct representation or authorized representation;
- Provide information to support the plan development by completing and returning the AMEC Data Collection Guide and validating/correcting critical facility inventories;
- Update existing mitigation actions and identify additional mitigation actions for the plan (at least one);
- Review and comment on plan drafts;
- Inform the public, local officials, and other interested parties about the planning process and provide an opportunity for them to comment on the plan;
- Provide documentation to show time donated to the planning effort (related to FEMA planning grant awarded to the County); and
- Formally adopt the mitigation plan.

All of the jurisdictions listed as official participants in this plan met all of these participation requirements. **Table 1.1** shows the representation of each participating jurisdiction at the planning meetings, provision of Data Collection Guides, critical facility validation, update/development of mitigation actions, and documentation of donated time. Sign-in sheets are included in Appendix B: Planning Process Documentation.

Table 1.1. Jurisdictional Participation in Planning Process

| Jurisdiction | Kick-off Meeting | Meeting #2 | Meeting #3 | Data Collection Guide | Update/Develop Mitigation Actions |
|-------------------------|------------------|------------|------------|-----------------------|-----------------------------------|
| Polk County | X | X | X | X | X |
| City of Alleman | | X | X | X | X |
| City of Altoona | X | X | | X | X |
| City of Ankeny | X | X | X | X | X |
| City of Bondurant | X | X | X | X | X |
| City of Clive | X | X | X | X | X |
| City of Des Moines | X | X | X | X | X |
| City of Elkhart | | X | X | X | X |
| City of Grimes | X | X | X | X | X |
| City of Johnston | X | X | X | X | X |
| City of Mitchellville | X | X | | X | X |
| City of Pleasant Hill | X | X | X | X | X |
| City of Polk City | X | | X | X | X |
| City of Runnells | | X | | X | X |
| City of Urbandale | X | X | X | X | X |
| City of West Des Moines | X | X | X | X | X |
| City of Windsor Heights | X | X | X | X | X |

| Jurisdiction | Kick-off Meeting | Meeting #2 | Meeting #3 | Data Collection Guide | Update/Develop Mitigation Actions |
|----------------------------------|------------------|------------|------------|-----------------------|-----------------------------------|
| Des Moines Water Works | X | | | X | X |
| Ankeny Schools | | X | X | X | X |
| Bondurant-Farrar School District | | | X | X | X |
| Dallas Center-Grimes Schools | | X | | X | X |
| Des Moines Independent Schools | | X | X | X | X |
| Johnston School District | X | | | X | X |
| North Polk Schools | | X | X | X | X |
| Southeast Polk Schools | | X | | X | X |
| Urbandale Schools | | X | | X | X |
| West Des Moines Schools | X | X | X | X | X |

1.4.2 The Planning Steps

AMEC and Polk County worked together to establish the framework and process for this planning effort using FEMA's *Local Mitigation Planning Handbook* (March 2013). The plan update was completed utilizing the 9-task approach within a more broad four-phase process:

- 1) Organize resources,
- 2) Assess risks,
- 3) Develop the mitigation plan, and
- 4) Implement the plan and monitor progress.

Into this process, AMEC integrated a detailed 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the process used for this plan meets the funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program. **Table 1.2** shows how the process followed fits into FEMA's original four-phase DMA process as well as the revised Nine Task Process outlined in the 2013 *Local Mitigation Planning Handbook* and the 10-step CRS process.

Table 1.2. Mitigation Planning Process Used to Develop the Polk County Multijurisdictional Local Hazard Mitigation Plan

| Phase | Community Rating System (CRS) Planning Steps (Activity 510) | Local Mitigation Planning Handbook Tasks (44 CFR Part 201) |
|-----------|---|--|
| Phase I | Step 1. Organize | Task 1: Determine the Planning Area and Resources Task 2: Build the Planning Team 44 CFR 201.6(c)(1) |
| | Step 2. Involve the public | Task 3: Create an Outreach Strategy y 44 CFR 201.6(b)(1) |
| | Step 3. Coordinate | Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3) |
| Phase II | Step 4. Assess the hazard | Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii) |
| | Step 5. Assess the problem | |
| Phase III | Step 6. Set goals | Task 6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii) |
| | Step 7. Review possible activities | |
| | Step 8. Draft an action plan | |
| Phase IV | Step 9. Adopt the plan | Task 8: Review and Adopt the Plan |
| | Step 10. Implement, evaluate, revise | Task 7: Keep the Plan Current |
| | | Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4) |

Phase I Organize Resources

Step 1: Organize the Planning Team (Handbook Tasks 1 & 2)

The planning process resulting in the preparation of this plan document officially began with a scoping meeting in Des Moines, Iowa on July 2, 2013. Participants of the meeting included Polk County Emergency Management officials and AMEC Mitigation Planning staff. The purpose of this meeting was to determine the jurisdictions and other stakeholders that would be invited to be participants of the HMPC (Step 1), set tentative planning meeting dates, provide recommendations regarding the hazards to be included in the plan update, discuss options for the flood risk assessment methodology, develop an initial public participation strategy, and discuss the plan update format. Detailed meeting minutes are included in Appendix B.

A HMPC was created that includes representatives from each participating jurisdiction, departments of the County, and other local, state, and federal organizations responsible for making decisions in the plan and agreeing upon the final contents. In addition to the participating jurisdictions, the agencies and organizations that participated in the planning meetings included the following:

- American Red Cross
- FEMA RiskMap Regional Program Manager
- STARR, FEMA RiskMap Contractor
- Iowa Homeland Security and Emergency Management Division
- Iowa Department of Transportation
- Iowa Department of Natural Resources

- Iowa Homeland Security and Emergency Management
- Iowa National Guard
- Iowa Fusion Center
- EMC Insurance
- MidAmerican Energy
- Adjacent County Emergency Managers

After the scoping meeting, a formal Kick-off meeting was held on July 30, 2013 followed by two additional planning meetings held on October 17, 2013 and January 9, 2014. A complete list of all representatives of the agencies and organizations that participated on the Polk County HMPC is provided in Appendix B.

The HMPC communicated during the planning process with a combination of face-to-face meetings, phone interviews, and email correspondence. The meeting schedule and topics are listed in **Table 1.3**. The meeting minutes for each of the meetings are included in Appendix B.

Table 1.3. Schedule of HMPC Meetings

| Meeting | Topic | Date |
|-----------------------|--|------------------|
| Informational Meeting | General overview of planning process/requirements and schedule. | July 2, 2013 |
| Kick-off Meeting | Introduction to DMA, the planning process, hazard identification and public input strategy. Distribution of data collection guide to jurisdictions. Preliminary hazard ranking results. Determine process to monitor, evaluate, and update plan. | July 30, 2013 |
| Planning Meeting #2 | Review of draft Risk Assessment, distribution of critical facility inventories for jurisdictions to validate/correct, development of plan goals. | October 17, 2013 |
| Planning Meeting #3 | Mitigation action update, development, and prioritization. | January 9, 2014 |

During the kickoff meeting, AMEC presented information on the scope and purpose of the plan, participation requirements of HMPC members, and the proposed project work plan and schedule (see **Figure 1.1** for photo of HMPC meeting). Plans for public involvement (Step 2) and coordination with other agencies and departments (Step 3) were discussed. AMEC also introduced hazard identification requirements and data needs. The HMPC discussed potential hazards as well as past events and impacts and refined the identified hazards to be relevant to Polk County. The hazard ranking methodology utilized by Iowa Homeland Security and Emergency Management Division in the State Hazard Mitigation Plan was introduced and the HMPC made preliminary determinations of probability, magnitude, warning time, and duration for each hazard identified.

Participants were given the AMEC Data Collection Guide to facilitate the collection of information needed to support the plan, such as data on historic hazard events, values at risk, and current capabilities. Each participating jurisdiction completed and returned the worksheets in the Data Collection Guide to AMEC. AMEC integrated this information into the plan, supporting the development of Chapters 2 and 3.

Figure 1.1. Hazard Mitigation Planning Committee Kickoff Meeting



Step 2: Plan for Public Involvement (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

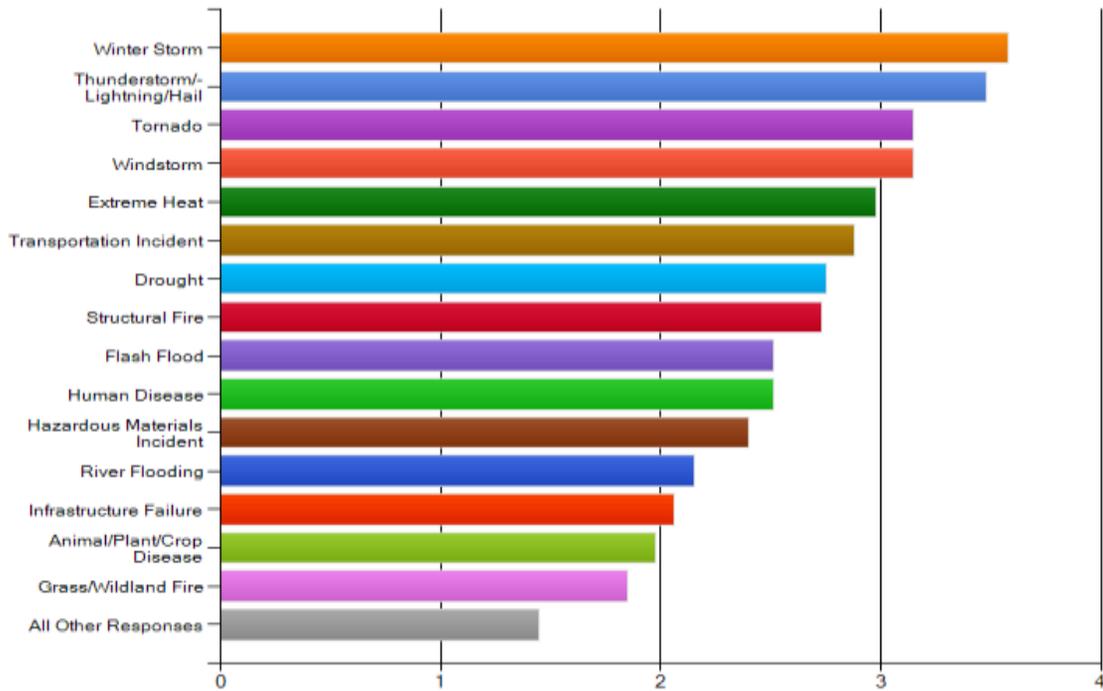
At the kickoff meeting, the HMPC discussed options for soliciting public input on the mitigation plan. To provide an opportunity for the public to comment during the drafting stage, the committee determined that the most effective method would be dissemination of a survey.

A survey was developed specific to the Polk County Mitigation Plan that provided a brief plan summary as well as a questionnaire to capture public and stakeholder input. The survey is provided in Appendix B. A press release was issued announcing the availability of the survey at city halls as well as online at SurveyMonkey.com. In addition, committee members distributed the survey to members of the public and key stakeholders in their own jurisdiction. A few of the efforts made to disseminate the survey are described below. Additional details such as the press release that was issued are included in Appendix B.

- Polk County Emergency Management added a description of the planning process as well as the survey link to their website.
- Polk County included a summary of the planning process with the link to the survey in the Board of Supervisors newsletter that is mailed out monthly with the water bill to Des Moines Water Works customers.
- The Ankeny School District included a summary of the planning process with the link to the survey in the school district newsletter.
- A notice with the survey link was published in the Des Moines Register.
- The Des Moines Register featured an article about the planning process, including the survey.

In all, 456 surveys were completed. The survey asked the public and stakeholders to indicate their opinion on the likelihood for each hazard to impact their jurisdiction. They were asked to rate the probability of each hazard profiled in this plan as 1-unlikely, 2-occasional, 3-likely, and 4-highly likely. The summary results of this question are provided in **Figure 1.2**.

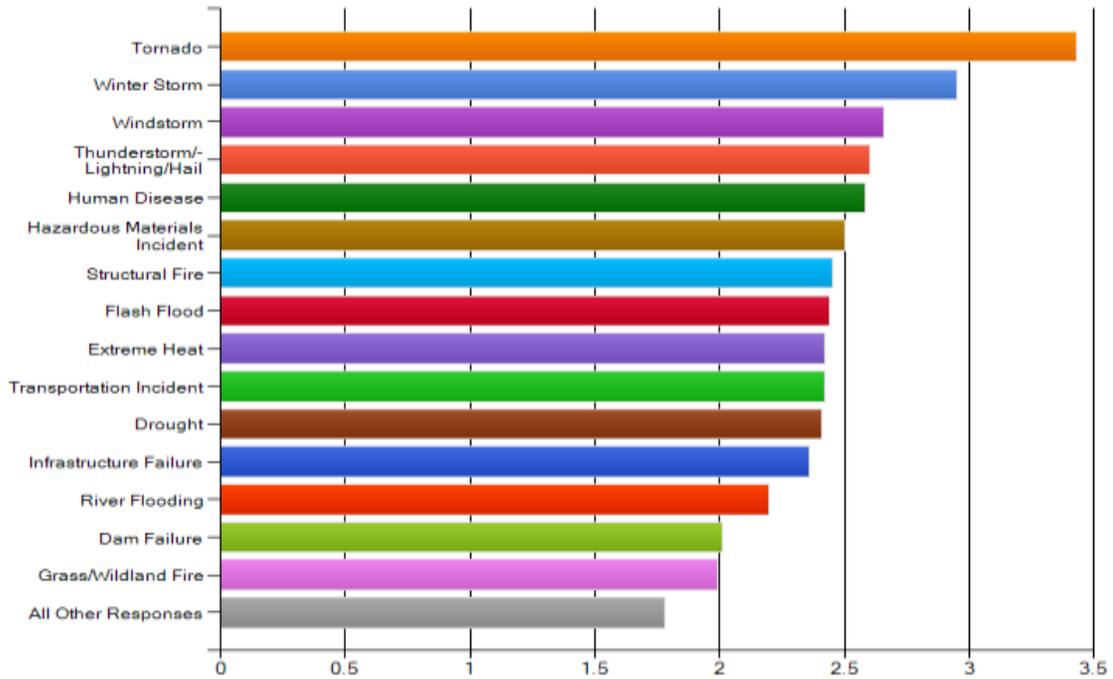
Figure 1.2. Survey Results—Probability of Hazards



Source: SurveyMonkey Results

The survey also asked the public and stakeholders to indicate their opinion on the potential magnitude of each hazard on their jurisdiction. They were asked to rate the probability of each hazard profiled in this plan as 1-negligible, 2-limited, 3-critical, and 4-catastrophic. The summary results of this question are provided in **Figure 1.3**.

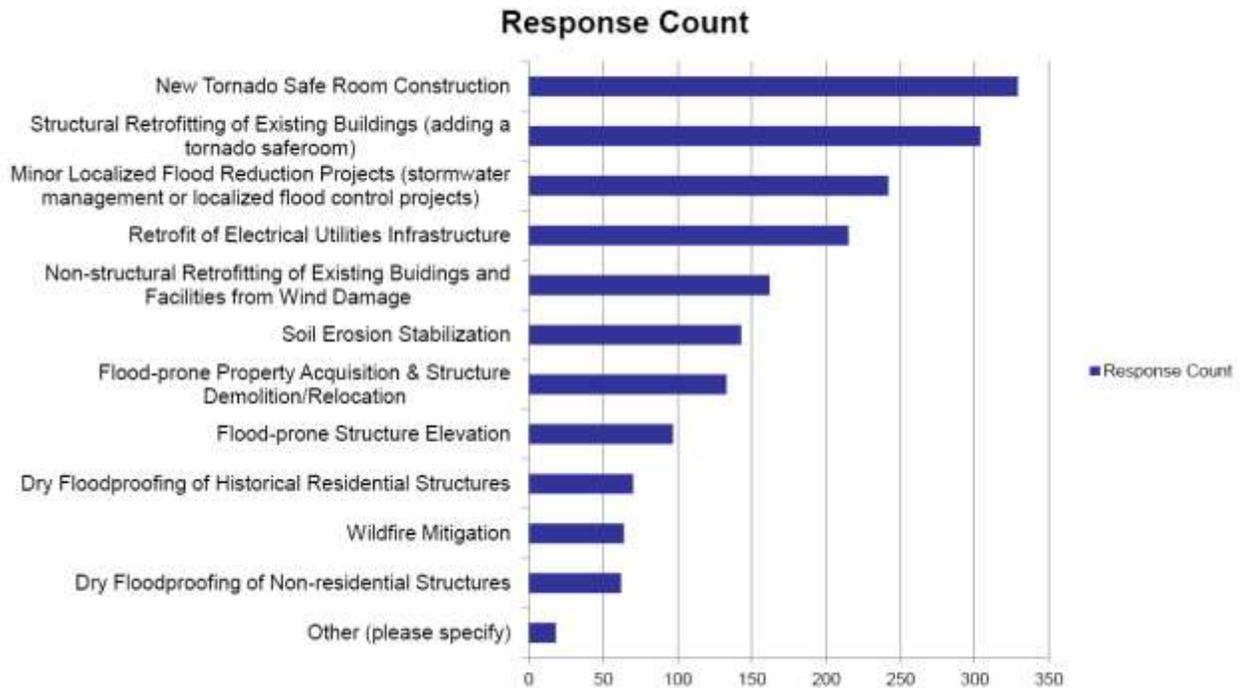
Figure 1.3. Survey Results—Magnitude of Hazards



Source: SurveyMonkey Results

In the survey, the public was also asked to review 11 types of mitigation actions considered by the Iowa Homeland Security and Emergency Management Division for FEMA funding. The Polk County HMPC also considered these types of projects in the Polk County Multi-jurisdictional Hazard Mitigation Plan. The survey asked the public to place a check next to the mitigation project types that they felt could benefit their community. **Figure 1.4** provides the compiled results of this question.

Figure 1.4. Survey Results—Types of Projects



Source: SurveyMonkey Results

The hazard ranking methodology utilized by the Iowa State Hazard Mitigation Plan was applied to the public opinions of probability and magnitude to provide a comparison of the public's opinion to that of the HMPC (See Chapter 3 for additional details of this methodology). The public was not surveyed about the elements of warning time and duration. Therefore, the HMPC scores for those elements were applied to the public ranking to allow for comparison.

Table 1.4 provides the comparison.

Table 1.4. Comparison of Hazard Ranking (Public vs. HMPC)

| Public Survey Results | | HMPC Results | |
|-----------------------------|----------------|-----------------------------|----------------|
| Hazard | Weighted Score | Hazard | Weighted Score |
| Winter Storm | 3.25 | Winter Storm | 3.15 |
| Tornado | 3.00 | Tornado | 2.95 |
| Thunderstorm/Lightning/Hail | 2.90 | Thunderstorm/Lightning/Hail | 2.65 |
| Windstorm | 2.87 | Windstorm | 2.75 |
| Transportation Incident | 2.72 | Transportation Incident | 3.10 |
| Structural Fire | 2.66 | Structural Fire | 3.10 |
| Infrastructure Failure | 2.64 | Infrastructure Failure | 2.50 |
| Human Disease | 2.60 | Human Disease | 2.50 |
| HAZMAT Incident | 2.53 | HAZMAT Incident | 3.10 |
| Extreme Heat | 2.52 | Extreme Heat | 1.95 |
| Drought | 2.51 | Drought | 2.50 |
| Dam Failure | 2.26 | Dam Failure | 2.35 |
| Flash Flood | 2.26 | Flash Flood | 3.10 |
| Levee Failure | 2.23 | Levee Failure | 2.80 |
| River Flooding | 2.18 | River Flooding | 3.25 |
| Animal/Plant/Crop Disease | 2.03 | Animal/Plant/Crop Disease | 1.60 |
| Sinkholes/Landslide | 1.87 | Sinkholes/Landslide | 1.45 |
| Earthquake | 1.74 | Earthquake | 1.45 |
| Grass/Wildland Fire | 1.68 | Grass/Wildland Fire | 2.35 |
| Expansive Soils | 1.48 | Expansive Soils | 1.45 |

Source: SurveyMonkey Results, HMPC

It was noted by the planning committee that the public perception of river flood and flash flood seem to indicate that the public does not consider these hazards to be as much of a threat as the planning committee does. Reasons for this may be that the individuals that took the survey may not live in flood-prone areas. Overall, floodplains and flash-flood-prone areas are a relatively small percentage of the developed areas in Polk County. So, although flooding does occur and does result in the need for evacuations, flood damages, and extensive recovery operations, the percentage of the general public that is affected is relatively low. In contrast, the weather-related hazards such as winter storm and tornadoes affect the entire population, as these hazards are not limited to certain geographic areas as floods are. These hazards were ranked high by both the committee and the public. Other similarities include the similar ranking of structural fire and transportation incident near the top and the geographic hazards of earthquake, sinkholes/landslide, and expansive soils near the bottom.

The public was also asked to comment on any other issues that the Polk County HMPC should consider in developing a strategy to reduce future losses caused by natural hazard events. Some of the comments provided by the public are included below:

“The Storm Sewer System on E 27th St between Guthrie Ave & Easton Blvd is many decades old and needs to be replaced to be able to handle periods of heavy rain.”

“...adding a road between Merle Hay Road west across Beaver Creek to 54th Street would help if we have flooding like 1993. We really do need a third option to connect Johnston.”

“Adding a tornado safe room to existing schools and new schools for the safety of our kids.”

“Flooding, levees, dams, etc. are a huge concern nearby, but I did not check those because my particular jurisdiction is uphill from all that.”

“Please spend this money wisely on broad factors rather than giving money to people who built in a flood zone, knew they bought in a flood zone, or are simply expecting the gov't to bail them out if there is a problem.”

“I would like to recommend Tornado Saferooms for our local mobile home parks.”

“Need more public education.”

In addition to providing information regarding availability of the survey on their website, Polk County Emergency Management posted all meeting agendas, meeting minutes, Data Collection Forms, and other meeting handouts on its website throughout the plan update process. Provision of these materials ensured that the general public was informed regarding all steps of the planning process, as well as being given the opportunity to provide input.

The public was also given an opportunity to provide input on a draft of the complete plan prior to its submittal to the State and FEMA. The entire plan draft was made available on the County's website as a PDF document. In addition, two hard copies were made available; one at the Emergency Management Office and the other at the Polk County Administration Building.

Polk County announced the availability of the entire final draft plan and the two-week final public comment period on their website. A copy of the announcement is provided in Appendix B. The final public comment period was from March 18-31, 2014.

The HMPC invited other targeted stakeholders to comment on the draft plan via an e-mail letter, which is described in greater detail in Step 3: Coordinate with Other Departments and Agencies. Minor comments were received and incorporated.

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are numerous organizations whose goals and interests interface with hazard mitigation in Polk County. Coordination with these organizations and other community planning efforts is vital to the success of this plan. Polk County invited neighboring counties, other local, state, and federal departments and agencies to the planning meetings to learn about the hazard mitigation planning initiative. In addition, the HMPC developed a list of additional stakeholders involved in hazard mitigation activities, to invite by e-mail letter to review and comment on the draft of the Polk County Multi-jurisdictional Hazard Mitigation Plan prior to submittal to the State and FEMA.

Those agencies were invited to meetings and/or comment on the plan draft included emergency management officials of adjacent counties, members of academic organizations such as the University of Iowa Flood Center, the municipal Chambers of Commerce in Polk County, various state agencies such as the Iowa Department of Natural Resources, as well as various federal agencies. Appendix B includes a complete list of those organizations invited to participate in the planning meetings as well as a copy of the e-mail letter that was sent providing a link to the draft plan during the final public comment period. The agencies and organizations other than the participating jurisdictions that attended in the planning meetings included the following:

- American Red Cross
- FEMA RiskMap Regional Program Manager
- Iowa Homeland Security and Emergency Management Division
- Iowa Department of Transportation
- Iowa Department of Natural Resources
- Iowa Homeland Security and Emergency Management
- Iowa National Guard
- Iowa Fusion Center
- EMC Insurance
- MidAmerican Energy
- Adjacent County Emergency Managers

Coordination with FEMA Risk MAP Project

Specific to the River Flood Hazard, special effort was made to ensure hazard mitigation planning activities were coordinated with the FEMA RiskMap Project that was underway simultaneous with this plan update. Polk County Emergency Management, AMEC, FEMA, and FEMA's Risk MAP partners participated in various conference calls throughout the planning process.

- **July 30, 2013:** The purpose of this call was to discuss areas where the planning processes for RiskMap and the Mitigation Plan Update can be coordinated. Participants included FEMA's RiskMap Consultant (STARR), Polk County Emergency Management, and AMEC. The schedules for both efforts were reported and it was agreed that the mitigation strategy processes for both projects should be coordinated as much as possible.
- **August 6, 2013:** The purpose of this call was to discuss the best available data for the flood risk analysis portion of the Polk County's Multi-jurisdictional Hazard Mitigation Plan Update. Participants included FEMA, FEMA's RiskMap Consultant (STARR), Polk County Emergency Management, and the Iowa Flood Center. The Iowa Department of Natural Resources was unable to attend the conference call. However, they were contacted independently to ensure agreement with decisions made. As a result of this call, it was decided that the revised data from the Iowa Flood Center for the approximate study areas would be integrated into the Preliminary Digital Flood Insurance Rate Map by AMEC to serve as the basis for the river flood hazard areas within Polk County.
- **October 3, 2013:** The purpose of this call was to further discuss coordination of the mitigation strategy phases of both projects. Participants included FEMA's RiskMap Consultant (STARR), Polk County Emergency Management, and AMEC. During this call, it was decided that the RiskMap project "Flood Risk Review Meeting" and the Mitigation Plan

Update project “Mitigation Strategy” meeting would both take place at the Polk County Emergency Management Emergency Operations Center on January 9th. It was decided to hold the RiskMap portion of the meeting in the morning during which the revised flood risk areas would be discussed along with river flood mitigation actions. The Mitigation Strategy meeting was scheduled for the afternoon of the same day to re-cap the flood mitigation actions developed and continue with mitigation action development for the remaining 20 hazards in the Hazard Mitigation Plan.

Mitigation Strategy Meeting Coordination Efforts with Risk MAP

- On **January 9th, 2014**, Polk County Emergency Management hosted two meetings at the Polk County Emergency Operations Center to discuss Risk MAP and the Hazard Mitigation Plan. The Risk MAP meeting was held in the morning and the Hazard Mitigation Plan meeting was held in the afternoon. The goal of holding both meetings on the same day was to offer additional opportunities for collaboration and coordination and to ensure consistent approaches relating to mitigation actions developed to reduce risk. The specific objectives of the meetings are provided below.
 - Risk MAP Meeting Objectives: To present and explain new Risk MAP products and flood risk datasets for communities in Polk County, to discuss study methods being used in the ongoing flood study and provide an update on study progress, and provide information about how communities can elevate risk awareness and stimulate mitigation actions to reduce risk. This interactive meeting allowed an opportunity for technical staff to view each community’s spatial flood risk data and ask questions about the data development methods. It was also an opportunity to learn about how communities can use this data to communicate risk to residents.
 - Hazard Mitigation Plan Meeting Objectives: To update specific mitigation actions included in the plan’s Mitigation Strategy section. During the meeting, the planning committee discussed the actions in the previous hazard mitigation plan, reviewed key issues from the top 10 hazards, and participated in a discussion to determine any additional actions to include in the plan update.

Integration of Other Data, Reports, Studies, and Plans

In addition, input was solicited from many other agencies and organizations that provided information but were not able to attend planning meetings. As part of the coordination with other agencies, the HMPC collected and reviewed existing technical data, reports, and plans. These included:

- Iowa Hazard Mitigation Plan (September 2013);
- Polk County Hazard Mitigation Plan (July 2009)
- Polk County Health Department Hazard Vulnerability Assessment (August 2012)
- National Flood Insurance Program’s Community Information System Reports;
- Preliminary Digital Flood Insurance Rate Maps for all of Polk County and corresponding Draft Flood Insurance Study;
- Iowa Department of Natural Resources, Dam Safety Program Inventory of Dams for Polk County;

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- Available Dam Safety Inspection Reports from the Iowa Department of Natural Resources Dam Safety Program for High Hazard Dams;
 - Saylorville Lake Dam Failure Inundation Data from the U.S. Army Corps of Engineers;
 - Wildland and Grass Fire Reports from the Iowa Department of Natural Resources, Wildland Fire Program;
 - National Fire Incident Reporting System Fire Incident Data;
 - Wildland/Urban Interface and Intermix areas from the SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin;
 - Various local plans such as Comprehensive Plans, Economic Development Plans, Emergency Operations Plans, Capital Improvement Plans, etc. For a complete list of local plans that were reviewed and incorporated, see Chapter 2;
 - US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics;
 - Goods Movement in the Des Moines Metropolitan Area, 2002; and
 - Iowa Flood Center Revised Flood Risk Areas for Approximate Study Areas.

This information was used in the development of the hazard identification, vulnerability assessment, and capability assessment and in the formation of goals, objectives, and mitigation actions. These sources, as well as additional sources of information are documented throughout the plan and in Appendix A, References.

Phase 2 Assess Risk (Handbook Task 5)

Step 4: Assess the Hazard: Identify and Profile Hazards

AMEC assisted the HMPC in a process to identify the hazards that have impacted or could impact communities in Polk County. At the kick-off meeting, the HMPC examined the history of disaster declarations in Polk County, the list of hazards considered in the 2013 Iowa State Hazard Mitigation Plan, and the hazards identified in the previous hazard mitigation plan. The committee then worked through this list of all potential hazards that could affect the planning area. They discussed past hazard events, types of damage, and where additional information might be found. The committee identified 20 natural and human-caused hazards that have the potential to impact the planning area. Additional information on the hazard identification process and which hazards were identified for each jurisdiction is provided in Chapter 3.

During the kick-off meeting, the HMPC refined the list of hazards to make the analysis relevant to Polk County, discussed past events and impacts and came to consensus on the preliminary probability, magnitude, warning time, and duration levels on a county-wide basis to contribute to the hazard ranking methodology utilized by the State. In addition, each jurisdiction completed a Data Collection Guide, including information on previous hazard events in their community. Utilizing the information from the Data Collection Guides as well as existing plans, studies, reports, and technical information as well as information available through internet research and GIS analysis, a profile was developed for each hazard identified. More information on the methodology and resources used to identify and profile the hazards can be found in Chapter 3.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Assets for each jurisdiction were identified through a combination of several resources. The City of Des Moines Information Technology Department provided access to public datasets with parcel and building data compiled through the Des Moines Area Regional GIS Partnership. Population data was obtained from the U.S. Census Bureau. The inventory of critical and essential facilities for analysis in the risk assessment was derived in part from a 2011 FEMA-funded HAZUS project undertaken by the City of Des Moines Information Technology Department to enhance the Des Moines Area Regional GIS to support hazard identification and risk assessment. Updated inventories of the following data-sets were integrated into the HAZUS project layer: nursing homes, childcare facilities, dams, and chemical facilities. At Meeting #2, the compiled inventories were provided to each jurisdiction for the facilities that fall within their jurisdictional boundaries for correction and validation. Once the critical/essential facility lists were validated, those without latitude/longitude points were geo-located to create a consolidated GIS layer of these facilities to be used in additional risk analysis. Methodologies and results of the analyses are provided in Chapter 3 and Appendix E.

Additional assets such as historic, cultural, and economic assets as well as specific vulnerable populations and structures were obtained from a variety of sources as described in Chapter 3.

The HMPC also analyzed development trends from data available from the U.S. Census Bureau as well as information obtained from each jurisdiction such as Comprehensive Plans and Future Development Plans. For each hazard, there is a discussion regarding future development and how it may impact vulnerability to that specific hazard.

After profiling the hazards that could affect Polk County and identifying assets, the HMPC collected information to describe the likely impacts of future hazard events on the participating jurisdictions.

Existing mitigation capabilities were also considered in developing loss estimates. This assessment consisted of identifying the existing mitigation capabilities of participating jurisdictions. This involved collecting information about existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk from hazards. Participating jurisdictions collected information on their regulatory, personnel, fiscal, and technical capabilities, as well as previous and ongoing mitigation initiatives. This information is included in Chapter 2 Planning Area Profile and Capabilities.

Specific capabilities such as participation in the National Flood Insurance Program as well as designation as Fire Wise Communities or Storm Ready Communities and placement of storm sirens are incorporated in the vulnerability analysis discussions, where applicable.

Taking into consideration the vulnerability and capability assessments, and where sufficient information was available, a variety of methods was used to estimate losses for each profiled hazard. For geographic hazards such as river flooding, dam failure of the federal dams in the planning area, and levee failure specific assets at risk and loss estimates were determined through GIS analysis. For the earthquake hazard, FEMA's loss estimation computer software, HAZUS-MH was utilized to estimate losses in the planning area. For other hazards such as weather-related hazards and hazardous materials, loss estimates were developed based on statistical analysis of historic events. For hazards such as dam failure of state-regulated dams,

GIS data was not available to identify specific geographic boundaries at risk. Therefore, the risk assessment provides descriptions of the types of improvements located in approximated risk areas as well as aerial photographs depicting development downstream of high hazard dams. For some human-caused hazards and the tornado hazard, loss estimates were scenario-based. The methodologies for each loss estimate are described in detail in Chapter 3. Within each hazard section, the text provides details on how the hazard varies by jurisdiction, where applicable. In addition, at the conclusion of each hazard section, a summary table indicates the specific probability, magnitude, warning time, and duration rating of the hazard for each jurisdiction is provided to show how the hazard varies. Where applicable, introductory text preceding the table highlights noted variables.

Results of the preliminary risk assessment were presented at Meeting #2 and the Draft Risk Assessment (Chapter 3) was provided to the HMPC for review and comment. Several comments, corrections, and suggestions were provided to AMEC and incorporated into the risk assessment as appropriate.

Hazard Ranking Summary and EMAP Consequence Analysis

The conclusion of the Risk Assessment Chapter (Chapter 3) provides a tabular summary of the hazard ranking for each jurisdiction as well as a consequence analysis summary for each hazard based on Emergency Management Accreditation Program (EMAP) risk assessment standards.

Phase 3 Develop the Mitigation Plan (Handbook Task 6)

Step 6: Set Goals

AMEC facilitated a discussion session with the HMPC during Meetings #2 to review and update goals. Common categories of mitigation goals were presented as well as the 2013 State Hazard Mitigation Plan goals.

This planning effort is an update to an existing hazard mitigation plan. As a result, the goals from the *2009 Polk County Hazard Mitigation Plan* were reviewed. The planning committee decided that the 2009 goals are still valid, with one clarification. Goal 2 was revised to incorporate language about lessons learned from disasters and exercises. The goals for the plan update are provided below. The new text for goal #2 is in italics:

1. Protect the public health, safety, and welfare by increasing public awareness of hazards and by encouraging collective and individual responsibility for mitigating hazard risks.
2. Improve capabilities, coordination, and opportunities at municipal and county levels to plan and implement hazard mitigation projects, programs, and activities, *including incorporation of lessons learned from previous events and exercises.*
3. Improve data collection, use, and sharing to reduce the impact of hazards.
4. Protect the most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation actions.

Step 7: Review Possible Activities

The focus of Meeting #3 was to update the mitigation strategy by reviewing existing actions submitted in the previous mitigation plans as well as discuss relevant new actions considered necessary as a result of the updated risk assessment. The development of mitigation actions was facilitated through two separate, but related planning sessions. The morning session consisted of the RiskMap Flood Risk Review Meeting which included presentation of revisions to the mapped flood risk areas in Polk County as well as discussion of mitigation actions for the river flood hazard. In the afternoon session, update and development of mitigation actions continued for the remaining hazards with a re-cap of mitigation actions identified for river flooding in the morning session. The HMPC reviewed the Iowa Emergency Management and Homeland Security Division's HMA funding priorities as well as a handout describing the six types of mitigation projects generally recognized by FEMA. The group discussed the types of mitigation actions/projects that could be done by the jurisdictions in Polk County. Consideration was given to the analysis results provided in the risk assessment and the anticipated success for each project type. Committee members discussed issues such as: availability of funds, prioritization of actions, and feasibility of implementation utilizing the STAPLEE methodology as a guide. Projects relating to emergency response were discussed, but participants were encouraged to focus on long-term mitigation solutions since response-related mitigation actions occur on a routine basis as requirements of other plans. Complex projects that would necessitate use of large numbers of county resources were also discussed. This opportunity to discuss a broad range of mitigation alternatives allowed the jurisdictions to understand the overall priorities of the committee and to allow for discussion of the types of project most beneficial to each jurisdiction. As part of this discussion, consideration was given to the potential cost of each project in relation to the anticipated future cost savings.

Since this plan is an update to the *2009 Polk County Hazard Mitigation Plan*, the update of the mitigation strategy included review and update of the status of all actions included in the previous hazard mitigation plan. Jurisdictions were encouraged to maintain a focused approach and continue forward only those actions that are aimed at implementing long-term solutions to prevent losses from hazards. To facilitate the update of previous actions, a spreadsheet was provided to each jurisdiction prior to Meeting #3 with the actions they submitted in the previous mitigation plan. The jurisdictions were also provided instructions for completing the status of each of the previous actions as well as the details to provide for continuing and newly developed actions. A modified form of the STAPLEE prioritization tool was provided to assist jurisdictions in determining the prioritization that should be assigned to each action. Each participating jurisdiction prioritized the projects they submitted by indicating high, moderate, or low local priority. The completed spreadsheets with action details were returned to AMEC. For a comprehensive list of mitigation alternatives discussed, see Appendix C. Chapter 4 provides additional details regarding the process undertaken to refine the mitigation strategy to make Polk County and its jurisdictions more disaster resistant.

Step 8: Draft an Action Plan

A complete draft of the plan was made available online and in hard copy for review and comment by the public, other agencies and interested stakeholders. This review period was from March 18-31, 2014. Methods for inviting interested parties and the public to review and

comment on the plan were discussed in Steps 2 and 3, and materials are provided in Appendix B. Comments were integrated into a final draft for submittal to the Iowa Homeland Security and Emergency Management Division and FEMA.

Phase 4 Implement the Plan and Monitor Progress

Step 9: Adopt the Plan (Handbook Task 8)

To secure buy-in and officially implement the plan, the governing bodies of each participating jurisdiction adopted the plan. Scanned copies of resolutions of adoption are included in Appendix D of this plan.

Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

The HMPC developed and agreed upon an overall strategy for plan implementation and for monitoring and maintaining the plan over time during Meeting #1. This strategy is described in Chapter 5, Plan Maintenance Process.