MITIGATION OPPORTUNITIES, RECOMMENDATIONS, AND IMPLEMENTATION

Under the four planning goals, each objective is listed with one or more specific implementation methods, a priority classification, targeted completion date, potential funding source(s) if needed, explanatory text descriptions, current status description, descriptions of benefit-cost considerations (including technical feasibility and environmental soundness), and a reference or description of the item's relevance to a full range of hazards (including technological and human-related hazards).

The current implementation status ("2014 status") of each objective from the 2011 plan edition can be found in the "Comments" section under each objective, including an explanation of any delays or implementation problems.

Objectives from the previous 2011 plan that have been completed or removed (in their entirety) from further consideration (due to non-feasibility, consolidation or other reasons) have been transferred to the tables titled "Compendium of Addressed/Removed Objectives" at the end of this section.

To help keep retain continuity between this updated plan and the previous edition, and to assist in the tracking of implementation progress over time, Mitigation Objectives that have been completed or removed from consideration still appear here, but with strikethroughs to denote elements that are no longer considered current. The referenced Compendium table toward the end of this section then summarizes of all those objectives that have been completed or removed. Benefit-cost review text is provided for every objective, to explain why a net benefit would be expected if sufficient resources, staff time, interagency coordination, political priorities, etc. are sufficiently available to allow the objective's implementation. There are cases in which an objective has been removed due to a lack of these things, even though an explanation is provided about why the activity could result in a net benefit. In these instances, the "2014 status" text provides the most important reason(s) for the objective's current implementation status.

The list of currently active, prioritized objectives for the time period 2015-2024 is summarized in the corresponding table entitled "Summary of Target Completion Dates for Plan Objectives," at the very end of this section.

Goal 1

Promote Life Safety: Minimize disaster-related injuries and loss of life through public education, hazard analysis, and early warning.

Objective 1.1: Increase public / private sector awareness of hazard related dangers and mitigation solutions.
Implementation Method:

- State agencies will distribute information about hazard mitigation through training sessions, the internet, professional networks, and other readily available means.
- ~~Conduct a statewide mitigation marketing and public education campaign targeted at seven key professional groups.~~
- ~~Produce and distribute a CD with discipline-specific hazard mitigation information and recommendations / best practices.~~
- ~~Conduct introductory training (on the CD contents) for each target group as needed / appropriate.~~

Committee Priority: HIGH (ongoing)
Completion Target: 2016
Funding: HMA
Comments: An HMGP project under Federal Disaster 1346 (Statewide Mitigation Marketing and Public Education) had allowed the development of a notification "postcard" development (Phase I) with contracted assistance provided by Zimmerfish Associates (a Lansing-based public relations and advertising firm). Phase II had involved the development, by state employees, of mitigation educational materials specific to seven targeted professional groups, for distribution on CD-ROM. 2014 status: Instead of proceeding with the original marketing vision, staff has found it more efficient to develop and update existing guidance documents for the widest available distribution through internet web sites. This transformed objective can therefore be considered an ongoing activity.

BC REVIEW: Many casualties occur only because people were unaware of the actual risks present in hazards such as lightning, severe winds, industrial accidents, floods, hazardous materials incidents, public health emergencies, or wildfires. By building awareness through the provision of instructional materials and partnerships with other agencies (governmental, media, educational) at the local, state, and federal level, casualties are certainly prevented, for costs that are far less than most other projects. For example, the web posting of a booklet involves negligible marginal costs and therefore may pay off it its reading prevents even a single life from being lost. For example, the mere awareness of actual risks from lightning for persons outdoors may save lives.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant for all hazards.

Objective 1.2: Encourage and promote multi-hazard emergency plans in all public and private institutions, to include provisions for mitigating applicable hazards.
Implementation Method:

- Provide planning guidance, technical assistance, and continuous follow-up to applicable facilities, as required.

Committee Priority: HIGH (ongoing)
Completion Target: 2016
Funding: State Funding (General Fund), HMA, EMAP, etc.
BC REVIEW: Federal funding has been used for the development and maintenance of these plans, in accordance with the relevant regulations. Plan development is not evaluated for a cost-benefit ratio in the way that physical projects are (although federal funding for physical hazard mitigation projects requires FEMA-approved state and local plans to be in place, and the development of emergency response plans is an ongoing activity associated with the Emergency Management Performance Grant at both the state and local level). In view of the enormous potential impacts of hazards such as transportation accidents, terrorism, wildfires, and infrastructure failures, it clearly makes sense to have coordinated planning efforts taking place throughout the state. Such plans also help to justify budgets and priorities established for grant fund use. The planning process requires the involvement of multiple agencies and thus encourages these other agencies to contribute their efforts and resources toward at least some of the goals, activities, and projects identified by the plans. It has been reported by some local emergency management programs in Michigan that the benefits realized from multi-agency coordination, by themselves, were already considered to justify the local planning efforts, even before the plan had been completed.
Comments: 2014 status: The MCCERCC Hazard Mitigation Committee decided to re-classify this from low to high priority. Michigan schools are now required by 1999 PA 102 to plan for incidents of violence and other hazardous situations. Virtually all state owned facilities have an emergency plan in place that addresses a wide range of hazards. Community and site planning for hazardous materials are ongoing activities and one of the main missions of MCCERCC. These are ongoing activities that will be continued and supported by state staff, within resource limitations. State agencies also provide training to many persons in these subjects.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is clearly relevant for all hazards.

Objective 1.3: Promote local early warning systems and capability.
Implementation Method:

- ~~Develop state-recommended standards / best practices for early warning systems and capability – to include such factors as population coverage, specialized needs for critical facilities, etc.~~
- ~~With the assistance of local emergency management programs, conduct a comprehensive study of early warning coverage throughout the state to determine needs, gaps and shortfalls.~~
- Use information from local hazard mitigation plans to assess gaps in warning system coverage.
- Assist with funding warning systems and warning sirens in local jurisdictions, through the administration of FEMA Hazard Mitigation Assistance grant funds.

Committee Priority: MEDIUM
Completion Target: 2019
Funding: EMPG, HMA, HSGP
BC REVIEW: The great value of human life and health, and the relatively low cost by which many warning systems can alert large numbers of persons about hazardous events and conditions, warrant continued emphasis as a very cost-effective way of preventing casualties from all types of large-scale hazards. Michigan has been involved in the administration of federal funds that have been directed toward warning systems, with local emergency management programs themselves proposing the specific locations for sirens, and areas needing coverage by new warning systems. The selection process for these proposed warning systems involves an explicit comparison between the costs of each

outdoor siren and the number of persons living in the proposed siren's coverage area. Other types of warning systems, such as the provision of NOAA weather radios to facilities (including equipment that had been specially adapted to serve the hearing-impaired), the installation of radio relay towers, have also been funded. This is done in accordance with FEMA benefit-cost standards, typically through the use of "5%" State discretionary funds under HMA.
Comments: 2014 status: The MCCERCC Hazard Mitigation Committee decided to re-classify this from low to medium priority, reflecting the fact that many sirens have been funded by EMHSD through the use of federal funds available for the purpose. At certain times, the frequency of that activity would have qualified this action for high priority status, but the funds available for this activity have been quite limited in recent years. This objective was scaled back to reflect actual resources projected to be available. The State endorses the nationally-recognized Emergency Management Accreditation Program (EMAP) standards for early warning systems and capability as part of its ongoing local emergency management and hazard mitigation planning efforts. Federal mitigation grant funding will be provided, where available and appropriate, for future early warning capability enhancement projects, but this may only mean a small fraction of the mitigation funds available after a declared disaster.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant for multiple hazards.

Objective 1.4: Promote the concept of "safe rooms" within homes, businesses, and local/state governmental facilities to prevent and minimize injury and loss of life in tornadoes and severe winds.
Implementation Method:

- Print and make available FEMA's "safe room" construction plans; also permanently post the plans on the MSP/EMHSD web page.
- Work with the Michigan Committee on Severe Weather Awareness to promote safe rooms as a viable option for severe storms protection.
- As circumstances allow, develop prototype "safe rooms" within public buildings to serve as demonstration projects.
- Develop new (or enhance existing) safe space public information materials for mobile home residents.

Committee Priority: MEDIUM
Completion Target: 2019
Funding: HMA, EMPG
Comments: 2014 status: The MCCERCC Hazard Mitigation Committee decided to re-classify this from high to medium priority. Safe room demonstration project funded at Michigan State University Day Care Center under HMGP for Federal Disaster 1346. (This project, which includes eight safe rooms, was completed during 2002.) Bullet 1 – This documentation is available in hardcopy from MSP/EMHSD, and on a FEMA web site, referenced by the MSP/EMHSD web site. Bullet 2 – This is an ongoing effort. Bullet 3 – A safe room demonstration project was funded at the Grand Traverse Band of Ottawa and Chippewa Indians Reservation in Antrim, Benzie and Charlevoix Counties. Consisting of six safe rooms, it was completed in August, 2008. Bullet 4 – This is an ongoing effort.
BC REVIEW: Certain safe room projects have been shown to be cost-effective life-protective measures even when calculations have been focused exclusively on severe wind events. Safe rooms are potentially useful for other types of hazards for which sheltering may be useful, which might increase the cost-effectiveness of this strategy. (Technological and human-related hazard events that may result in a need for "sheltering in place," such as terrorism, nuclear attack, nuclear power plant accidents, or hazardous materials incidents; or for social distancing in response to public health emergencies or bioterrorism.) Each safe room location proposed for grant funding is considered on a case-by-case basis, using a FEMA-established quantitative assessment. (Additional safe room projects may be privately implemented, without the use of grant funds, by business and residential owners who have independently decided that the projects are useful.)
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: Yes – winds plus technological/human hazards
The concept of a fallout shelter now dates back many decades, although such shelters have historically seen much more use as tornado and storm shelters. An increased concern with terrorism could again bring new emphasis to all the sheltering functions that safe rooms might serve.

Objective 1.5: Support and utilize a system of real-time rainfall and river flow gauges throughout Michigan as part of an overall flood warning system.
Implementation Method:

- Support for multi-agency system of stream gauges and inter-gauge interpolation for local, state and federal users.

- Incorporate stream gauge system and data into State hazard analysis and resource protection activities.
- Encourage local and regional agencies to consider or make use of stream gauge data in their own activities.
- Maintain weather web site to display precipitation information so that agriculture and fire weather notice and actions may be undertaken in a timely manner.

Committee Priority: MEDIUM
Completion Target: 2019
Funding: Federal Funding (current effort led by U.S. Geological Survey; partnering agencies in Michigan)
Comments: Several state agencies supported a U.S. Geological Survey grant proposal to obtain funds for inter-gauge interpolation of stream gauge data during 2013. The "StreamStats" system would provide this information to local, regional, state, and federal agencies. Stream gauges are in place on many rivers throughout the state, but conditions between the gauges must be interpolated, to make the gauges maximally effective. 2014 status: This objective was substantially changed from the 2011 plan, to reflect recent activities involving government agencies, and although the committee re-classified it from LOW to HIGH priority, a subsequent lowering to MEDIUM was considered more appropriate when an update from USGS revealed that obstacles to the funding process had appeared. The fourth bullet point is addressed by an MDNR web site at http://glffc.utah.edu/.
BC REVIEW: Many gauges are already in place throughout Michigan as part of a real-time monitoring system (see the WaterWatch web site at http://waterwatch.usgs.gov), but the gauge locations do not cover all known floodplain and at-risk areas. Although an expansion of the gauge locations does seem to be cost-effective within floodplain areas that contain development, the capacity to use computers to interpolate stream conditions between these gauges would provide extra information for many areas throughout the state, at a reduced cost. Although designed for flood mitigation, these gauges also proved useful in the 2010 Enbridge pipeline break disaster, in which a large amount of fuel was accidentally released into the Tallmadge Creek and Kalamazoo River. Immediate access to water level measurements provided useful information for emergency responders, technicians, and engineers.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This particular item focuses directly upon natural (hydrological) hazards, although flood-related preparedness and response can also relate to the prevention of damages and impact that result in secondary hazards (from infrastructure failure, transportation accidents, hazardous materials incidents, etc.)

Objective 1.6: Develop comprehensive hazard analyses / risk assessments (as part of a hazard mitigation plan development process) in all local emergency management program jurisdictions to address all pertinent natural, technological and human-related hazards.

Implementation Method:

- Multi-year hazard analysis development process initiated in FY 2000 and is implemented by municipal and county governments and their partnering agencies, making use of local grant agreements (annual work plans for EMPG-funded emergency management programs) and dedicated hazard mitigation planning staff in MSP/EMHSD.
- Create hazard area data sets using the locally compiled and reported hazard data.
- Overlay the hazard area data on the critical facilities inventory and relevant population data to identify and further define and quantify risk and vulnerabilities.

Committee Priority: HIGH/ONGOING
Completion Target: 2016
Funding: EMPG, HMA
Comments: Local emergency management program jurisdictions (and their partnering agencies) use printed guidance materials, plus input and training opportunities, to develop a detailed hazard analysis as part of their local hazard mitigation plan development process. Local hazard data can be compiled by the MSP/EMHSD in detail over time, but in general form has already been taken into account during updates of the Michigan Hazard Analysis and Michigan Hazard Mitigation Plan. Some of this information is used at the state and local levels to develop and select hazard mitigation projects and to make more informed hazard mitigation decisions. 2014 status: This objective is still valid and remains an ongoing activity for MSP/EMHSD. It ties in with other assessment processes overseen by different branches of government, such as the flood map updates performed in coordination with MDNR. Bullets 2 and 3 are medium-term activities that rely upon accumulated information readily usable in Geographic Information Systems.
BC REVIEW: Federal funding has subsidized the development of local hazard analyses and mitigation plans in about 100 local Michigan EM programs. Since plans assist with quality hazard mitigation project selection, and the tens of millions of dollars so far spent on hazard mitigation has been estimated to save about 3 times as much in long-term

reductions in emergency response costs, property damage, environmental impacts, loss of life, and economic/business impacts, it has been deemed worthwhile to include the costs of planning as part of that calculation.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item addresses all types of hazards.

Goal 2

Reduce Property Damage: Incorporate hazard mitigation considerations into land use planning / management, land development processes, and disaster resistant structures.

Objective 2.1: Increase knowledge of urban/regional planners and emergency managers about sound land use and development practices that can help reduce long-term hazard risks and vulnerabilities.

Implementation Method:

- Partner with accreditation organizations for undergraduate and graduate city, urban, and regional planning programs at Michigan colleges and universities, to encourage integration of hazard mitigation principles and practices into comprehensive planning courses, and/or the development of a course (or courses) that discuss same.
- Partner with the American Institute of Certified Planners (AICP) and the American Planning Association to include questions pertaining to hazard mitigation on the exam for AICP certification.

Committee Priority: HIGH (Ongoing)
Completion Target: 2016
Funding: EMPG
Comments: 2014 status: The priority of this item was changed from Medium to High. A Hazard Mitigation / Comprehensive Plan Interface course is included in MSP/EMHSD PEM training requirements, and the course is consistently offered as part of the MSP/EMHSD training curriculum. In addition, hazard mitigation training sessions and presentations have been offered to planning and urban studies students at Wayne State University, Michigan State University and the University of Michigan at various times since 2001. These sessions and presentations continue to be offered as requested. In recent years, awareness and outreach has been greatest at Michigan State University, due primarily to the convenience of its location and the great overlap between State government and university social networks. Other educational institutions are hereby encouraged to inquire about having a guest speaker from EMHSD on the topics of hazard awareness, hazard vulnerabilities, and hazard mitigation activities. Outreach to additional Michigan universities and colleges will occur in the next couple of years (high priority). More widespread presentations have occurred at conferences around the state.
Information on the FEMA Mitigation Management Series training courses has been included in recent MSP/EMHSD Training Catalogs. Planning guidance is provided online and in MSP/EMHSD Publication 207a—"Hazard Mitigation Planning Handbook," which is scheduled for update in the next year (high priority). This document has been widely distributed to the planning community and to other professional disciplines involved in hazard mitigation and/or land use planning in Michigan.
BC REVIEW: The costs of guidance activities are being minimized through the use of internet resources. Guidance documents can be readily accessed from federal and state agency web sites, and their use is encouraged during correspondence, courses, and presentations. Selected speakers promote this objective through sessions at already-established conferences. Since these conferences are already held periodically, costs are not great to simply add or fill one of the sessions with a speaker on the subject. The publication of articles and letters in planning magazines and newsletters (or editorial postings on web pages and associated web logs) is also considered to be a very cost-effective means of reaching a large number of professionals. The costs of such activities would easily be justified if hazard awareness allows even just a few extra lives to be saved.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant for all types of hazards, and the urban and regional planning profession has traditionally sought to foresee and address such issues as infrastructure failures, transportation accidents, and potentially conflicting land uses (e.g. the segregation of industrial hazardous materials handling from schools and residential areas). Michigan's guidance documents and plans seek to expand planners' awareness of additional types of spatial and systemic interactions, such as the potential impact of hazards upon critical facilities, special populations, and other emergency management concerns (such as the capacity for evacuation and other emergency response actions within a vulnerable area).

Objective 2.2: Further define identified flood vulnerabilities in state owned/operated critical facilities.
Implementation Method:

- Conduct detailed follow-up studies of vulnerable state owned/operated critical facilities to help to determine the types of "brick and mortar" projects that would be required to permanently reduce identified facility vulnerabilities to flooding.
- Follow up with the Michigan Department of Technology, Management and Budget (MDTMB) regarding the implementation of study recommendations in affected facilities (as time, circumstances, and resources permit).

Committee Priority: MEDIUM
Completion Target: 2019 (Phased Implementation)
Funding: HMA, FEMA HMTAP, RiskMap, USGS, etc.
Comments: 2014 status: The priority of this objective was raised from Low to Medium. The Michigan Hazard Mitigation Plan itself provides a mechanism for accomplishing this task, although for homeland security purposes, the detailed list of critical facilities is suppressed in the public version of this document (Attachment A). More extensive analysis using Geographic Information Systems is anticipated to follow within the next 5 years or so. A detailed study of vulnerable state owned/operated critical facilities would help to determine the types of "brick and mortar" projects that would be required to permanently reduce any identified facility vulnerabilities to flooding. However, such a study may involve multiple agencies, or extra staff support through a FEMA HMTAP contract. Additional (flood) Map Modernization activities continue to occur in Michigan Counties. The ready availability of digitized floodplain information across Michigan will thus enable the quality of flood analysis to improve with subsequent editions of the MHMP. However, staff time (or HMTAP support) will need to be identified to make full use of available resources in producing a detailed analysis, and further dFIRM progress is still being awaited.
BC REVIEW: Specialized Geographic Information System resources will be the tool that makes this kind of research feasible. As digital flood information becomes available from the remaining Map Modernization projects in Michigan, it can be compared with other digital geo-data. The result can take the form of detailed maps that estimate flood risks throughout the state's diverse facility locations. Updated lists of critical facilities have recently been obtained for this 2014 plan update, and consolidated digital flood maps should be available for comparison over the next several years. A detailed assessment will still involve considerable staff time, but multiple agencies have taken this GIS approach to the subject, and large portions of the work might therefore be accomplished more quickly than a single agency could handle the task. A complete "layer" of floodplain areas throughout the state, "overlaid" with a complete layer of critical facility locations, would provide an ideal starting point, followed by further considerations of local topography and "first floor elevations" for facilities that may be at-risk. As with planning activities, the expected benefits of hazard mitigation activities that are informed by an analysis of risks would be expected to exceed the costs of that research.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is specific to the flood hazard, although some of the critical facilities in question involve other types of emergency concerns, such as public health, energy emergencies, transportation accidents, and infrastructure failure. Moreover, some of the topographic and hydrological analyses can be useful for hazards such as pipeline breaks, chemical spills, or water contamination.

Objective 2.3: Identify critical floodplain storage areas within the state and enter the data into appropriate Geographic Information Systems to enhance future land use planning and development decision making.
Implementation Method:

- Conduct a study of critical floodplain storage areas and digitize the results.
- Make the results available to all appropriate land use planning and regulatory agencies in the state.

Committee Priority: LOW
Completion Target: 2024 (Phased Implementation)
Funding: HMA, CAP, FEMA HMTAP, State Funding (General Fund)
Comments: Such a study would follow Objective 2.2 and therefore take extra time to implement. Previous plans had referenced the use of FEMA HMTAP, but such assistance was not used for this objective. Completion of digital flood mapping first needs to occur. 2014 status: This objective is still valid for future implementation. However, implementation is contingent upon further digitization of FIRM information.
BC REVIEW: Further development of digital geographic data sets may be needed on the part of specialized geologic or hydrologic agencies to make the costs (mostly staff time for data preparation and processing) lighter. With further

progress on that task, and confirmation that modeling capabilities are sufficiently valid, greater certainty about the cost-effectiveness of this objective would result.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused upon flood prevention, but may alleviate secondary flood impacts that involve other types of hazards.

Objective 2.4: Acquire/remove or relocate residential and commercial structures currently occupying floodways of Michigan rivers and streams.
Implementation Method:
- Identify structures in floodways.
- Acquire / relocate at-risk structures.

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA
Comments: 2014 status: Being addressed by ongoing Hazard Mitigation Assistance projects such as those in Ann Arbor and Plainfield Township. Previous work had included acquisition projects in Robinson Township (Ottawa County). The acquisition and relocation of structures occupying floodways (and floodplains) of Michigan rivers and streams remains a top-priority mitigation activity that is consistently identified for funding consideration under the various HMA program funding cycles.
BC REVIEW: The evaluation of this objective is typically assessed on a case-by-case basis, and the assent of private property owners is essential. In the case of grant-funded projects, a specific benefit-cost analysis calculation is required by FEMA to demonstrate the cost effectiveness at each proposed project site. Thus, those specific projects to be funded with federal matching grants will have had their cost-effectiveness verified.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on flood hazards.

Objective 2.5: Acquire/remove, relocate, or elevate the worst repetitive-loss structures in Michigan.
Implementation Method:
- Identify repetitive loss structures.
- Acquire / relocate or elevate repetitive loss structures.

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA
Comments:
2014 status: (Refer to the update narrative for Objective 2.4.) The acquisition and relocation of repetitive loss structures in Michigan remains a top priority mitigation activity under this plan. The list of repetitive loss properties in Michigan has been substantially reduced in recent years.
BC REVIEW: The evaluation of this objective is typically assessed on a case-by-case basis, and the assent of private property owners is essential. In the case of grant-funded projects, a specific benefit-cost analysis calculation is required by FEMA to demonstrate the cost effectiveness at each proposed project site. Thus, those specific projects to be funded with federal matching grants will have had their cost-effectiveness verified.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on flood hazards, although some repetitive loss properties may involve businesses that handle hazardous materials (or provide valuable community services), and thus help to prevent secondary harm from technological hazards.

Objective 2.6: Encourage Community Wildfire Protection Plans and establish and sustain additional FIREWISE communities, statewide.
Implementation Method:
- The MDNR will assist communities in developing Community Wildfire Protection Plans (CWPP).
- Communities with completed CWPPs are to be encouraged, as appropriate, to obtain FIREWISE designations to address their wildfire risks/vulnerabilities (where local willingness exists to establish and sustain the program).
- As MDNR staff resources allow, work with the identified communities to focus local activities to meet FIREWISE program requirements, fire-related elements of their CWPPs, “fire adapted community” standards, etc.

- Formally recognize outstanding CWPPs, examples of FIREWISE community participation, "fire adapted communities," and other wildfire-related achievements, as a "best practice" for other Michigan communities to emulate.
- Expand wildfire mitigation to include related efforts, such as the "fire adapted communities" standard, referenced in the new guidance document available at http://www.fs.fed.us/openspace/fote/reports/GTR-299.pdf.

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG, State Funding (General Fund)
Comments: 2014 status: The MHMCC and MDNR Forest Management Division began a joint effort to establish pilot "FIREWISE" communities in Michigan in 2001, and to expand the "FIREWISE" program statewide. A state "FIREWISE" Conference was held in December 2001. A statewide fire threat assessment project was partially funded under the HMGP for Federal Disaster 1346. This phase was completed and 1346 disaster funds have been closed out. Wildfire mitigation efforts are more diverse than just the FIREWISE program, so adjustments have been made in this objective, to recognize multiple means of increasing wildfire resilience and safety. Part of this objective had involved the completion of the "Wildfire Prevention in Southern Michigan Project" under Federal Disaster 1346-DR-MI, a disaster that had provided hazard mitigation funding which has since been closed out. Future, relevant projects covering multiple areas of the state are being promoted as time, resources and circumstances permit. (This objective had been part of 2.20 in the 2011 edition of the MHMP.)
BC REVIEW: This strategy would encourage CWPP, "Firewise," and other community preparedness and wildfire mitigation activities. Since it need not add heavy administrative or staffing requirements, and would be adopted by communities that have substantial wildfire risks, its guidance and coordination efforts toward wildfire preparedness, mitigation, and management is considered to be clearly cost-beneficial for these communities, in light of the substantial wildfire costs they have endured.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item addresses the wildfire hazard, which can also help to protect against the failure of critical facilities and infrastructure which may be located in the wildfire risk area.

Objective 2.7: Promote and assist with flood mitigation projects in all vulnerable areas, statewide.
Implementation Method:

- The MDEQ will continue their flood mapping coordination work, dam safety programs, NFIP outreach, and other activities to alleviate general flood risks (beyond the specific floodway and repetitive loss sites identified in Objectives 2.4 and 2.5).
- MSP/EMHSD will continue to provide technical assistance with, and promotion of, hazard mitigation planning that identifies potential at-risk sites for flood mitigation activities.
- MSP/EMHSD will continue to administer grant programs that allow federally subsidized flood mitigation activities to occur.
- Develop ways to evaluate flood damage to and caused by the failure of sewage handling systems.

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG, State Funding (General Fund)
Comments: 2014 status: This is a new objective, added to the 2014 plan in order to more broadly address flood mitigation activities beyond the more narrowly defined locations already listed under Objectives 2.4 and 2.5.
BC REVIEW: The evaluation of flood mitigation projects are typically assessed on a case-by-case basis, and the assent of private property owners is essential. In the case of grant-funded projects, a specific benefit-cost analysis calculation is required by FEMA to demonstrate the cost effectiveness at each proposed project site. Thus, those specific projects to be funded with federal matching grants will have had their cost-effectiveness verified. Hazard mitigation planning has long been considered to be cost-beneficial in order to identify and prioritize viable flood mitigation projects, and therefore is a federal requirement for the allocation of grant funds to specific projects. The final bullet point has been added here as a replacement for Objective 4.6.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on flood hazards, although the benefits may include reductions in infrastructure failures, hazardous material incidents, transportation accidents, and other flood-associated hazards.

Objective 2.8: Promote and assist with wildfire mitigation projects statewide.
Implementation Method:

- MDNR will make use of grants from the USDA Forest Service to help fund local communities in their development of Community Wildfire Protection Plans.
- Since wildfires can be very damaging in large areas of Michigan, scan local plans for hazard mitigation projects to support with technical assistance and/or federal hazard mitigation funds (if applicable).

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG, USDA Forest Service
Comments: 2014 status: This is a new objective, added to the 2014 plan in order to more address a greater variety of hazard mitigation activities beyond flooding. Action has already begun on the task in the first bullet point.
BC REVIEW: The evaluation of wildfire mitigation projects must be assessed on a case-by-case basis, because there is not an extensive history of funding for such projects. Yet, the damages from this hazard have been extensive, and therefore new ways to prevent or mitigate its impacts need to be explored. It would not be cost-effective to neglect to make such an effort.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses specifically on wildfire hazards.

Objective 2.9: Identify and fund appropriate mitigation measures for vulnerable public and private facilities and infrastructure.
Implementation Method:

- Continue to identify, solicit, fund and implement cost-effective, environmentally sound, and technically feasible mitigation projects under the HMA, EMPG and other pertinent programs.
- Per Objective 1.3, fund early warning systems under the HMGP 5% state discretionary set-aside provision and other pertinent programs.
- Per Objective 1.4, fund "safe rooms" within vulnerable public and private structures.
- Per Objective 2.2, further define identified flood vulnerabilities in state owned/operated critical facilities.
- Per Objective 2.4, acquire/remove or relocate all residential and commercial structures currently occupying the floodways of Michigan rivers and streams.
- Per Objective 2.5, acquire/remove, relocate, or elevate the worst NFIP repetitive-loss structures in the state.

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG, State Funding (General Fund), Private Funding (Partners TBD), FEMA HMTAP.
Comments: 2014 status: The objective that had previously been referred to under goal 4 is now listed under Goal 2, instead. This change involves the objective's new emphasis upon property protection rather than just agency coordination. Refer to the specific objectives referenced for more details related to each action item. The State of Michigan has funded, or is currently funding, structural and/or non-structural measures under each of the objectives listed in the "Implementation Method" descriptions. The recent advances in the development of many local hazard mitigation plans throughout the state should enable a more efficient process to be used to identify such vulnerabilities for potential funding, but this still requires considerable staff time at MSP/EMHSD. Since 2011, excellent progress has been made in the assembly and creation of digital critical facilities data, for Geographic Information System processing.
BC REVIEW: Although limited federal funds are available for hazard mitigation projects at any given time, such grant funds are only given to subsidize projects that have passed a formal, FEMA-mandated benefit-cost review, thus ensuring that such expenditures are considered to be cost-effective, on a case by case basis.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.

Objective 2.10: Promote and assist with severe wind mitigation projects statewide.
Implementation Method:

- Since tornadoes and severe winds are very damaging events in Michigan, scan local plans for hazard mitigation projects to support with technical assistance and/or federal hazard mitigation funds (if applicable).

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG
Comments: 2014 status: This is a new objective, added to the 2014 plan in order to more address a greater variety of hazard mitigation activities beyond flooding.
BC REVIEW: The evaluation of wind mitigation projects must be assessed on a case-by-case basis, because there is not an extensive history of funding for such projects. Yet, the damages from this hazard are extensive, and therefore new ways to prevent or mitigate its impacts need to be explored. It would not be cost-effective to neglect to make such an effort.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on wind hazards, although the benefits may include reductions in infrastructure failures, transportation accidents, and other hazards.

Objective 2.11: Promote and assist with winter weather mitigation projects statewide.
Implementation Method:

- Since severe winter weather is very damaging in Michigan, scan local plans for hazard mitigation projects to support with technical assistance and/or federal hazard mitigation funds (if applicable).

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG
Comments: 2014 status: This is a new objective, added to the 2014 plan in order to more address a greater variety of hazard mitigation activities beyond flooding.
BC REVIEW: The evaluation of winter weather mitigation projects must be assessed on a case-by-case basis, because there is not an extensive history of funding for such projects. Yet, the damages from this hazard are extensive, and therefore new ways to prevent or mitigate its impacts need to be explored. It would not be cost-effective to neglect to make such an effort.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on winter hazards, although the benefits may include reductions in infrastructure failures, transportation accidents, and other hazards.

Goal 3

Build Alliances: Forge partnerships with other public safety agencies and organizations to enhance and improve the safety and well being of all Michigan communities.

Objective 3.1: Promote urban forestry and vegetation management programs and initiatives to develop more resilient woodlands, streetscapes, and landscapes in communities throughout Michigan.

Implementation Method:

- Coordination and technical support to local urban forestry programs (professional guidance, training, and education; tree selection, planting, and maintenance; local tree ordinance development; public awareness and education; street and park tree management and planning; community climate adaptation planning; utility vegetation management, awareness, and safety; recognition/certification).
- Conduct periodic educational programs on creating and maintaining a storm-resistant urban forest, targeted at urban forestry programs and local public works agencies.

Comittee Priority: HIGH

Completion Target: 2016

Funding: EMPG, HMA, State Funding (General Fund), Private Funding

Comments: 2014 status: The wording of this objective had been revised by the MCCERCC hazard mitigation committee, and the objective's priority has been raised to HIGH, to better reflect actual programs and their effects. The MDNR Urban and Community Forestry (UCF) program covers the details in the first bullet point, and its recognition/certification aspects include designations such as "Tree City USA," "Tree Line USA," and Certified Arborist. The Michigan Urban and Community Forestry Council (MUCFC) is an advisory committee to state and urban foresters, and works to promote, recognize, and support effective and sustainable management of urban and community forests throughout the state.

BC REVIEW: Urban forestry programs have produced beneficial results in areas determined by local authorities (or utility providers) as being most cost-beneficial. For example, where tree damages are likely to block high-traffic roads, heavily damage nearby property, or interfere with the services provided by critical infrastructure (e.g. electricity, telephones, drain and sewer services), then preventive urban forestry activities have clearly been beneficial. By promoting these types of programs, numerous local residents and programs can more effectively identify the most promising locations and activities where the needs for action greatly exceed the associated costs.

ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused on the prevention of technological hazards involving infrastructure failure, whose causes include several natural hazards (such as severe winds and ice storms).

Objective 3.2: Promote floodplain management activities throughout Michigan, increase statewide participation in the National Flood Insurance Program, and ensure that the NFIP policy base accurately reflects the flood hazard threat in Michigan.

Implementation Method:

- Conduct Community Assistance Contacts (CACs) and Community Assistance Visits (CAVs) to promote the NFIP.
- Where feasible, promote participation in the NFIP (as a viable and prudent flood mitigation measure) in all MSP/EMHSD and MDEQ hazard mitigation guidance documents.
- Promote the NFIP at applicable governmental conferences and trade shows.
- Fully participate in all FEMA sponsored promotional events and activities for NFIP recruitment.
- Participation in Map Modernization activities and agency coordination around RiskMap efforts.

Committee Priority: HIGH (Ongoing)

Completion Target: 2016

Funding: EMPG, HMA, CAP, State Funding (General Fund)

Comments: 2014 status: This objective has had its priority increased from MEDIUM to HIGH. The activities identified in the Bullets above are important, ongoing implementation efforts. The MDEQ regularly conducts CACs and CAVs to promote the NFIP and floodplain management as part of its regular work plan under the federal CAP grant with FEMA. The MDEQ also regularly presents information on the NFIP at applicable conferences, training

workshops, trade shows, etc. involving both flood hazard management professionals and elected officials. Both activities will continue to the extent possible. Both the MSP/EMHSD and MDEQ promote NFIP participation in their hazard mitigation guidance publications, and will continue to do so to the extent possible. The activity has become a part of FEMA-approved local hazard mitigation plans throughout Michigan. Progress on flood map updates has been substantial and widespread, through the Map Modernization program. Several state agencies regularly attend local meetings in support of the RiskMap program, to identify hazard vulnerabilities and brainstorm local hazard mitigation activities.

BC REVIEW: Compared with the annual damages caused by flooding each year, the costs of encouraging communities to participate in the NFIP are minor. In addition to making flood insurance available to residents throughout these communities, the NFIP encourages flood mitigation activities designed to reduce future losses. The NFIP also encourages improvements in various policies and practices, designed to increase the long-term safety and security of residents and communities. The costs associated with such improvements are also not primarily borne by just a few agencies or stakeholders, but are widely distributed among a great many public and private stakeholders, in a carefully calculated manner. Thus, the efforts and expense borne by any single participant in this network of stakeholders tends to be appropriate, from a cost-effectiveness standpoint.

ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused on flood hazards.

Goal 4

Provide Leadership: Provide leadership, direction, coordination, guidance, and advocacy for hazard mitigation in Michigan.

Objective 4.1: Educate and inform local and state officials, political leaders, the public, and involved professional disciplines about hazard mitigation concepts, programs, processes, and considerations.

Implementation Method:

- Conduct educational seminars where feasible and appropriate.
- Develop, update, and distribute written guidance targeted to specific groups.
- Post relevant information on web pages of the MSP/EMHSD and other agencies.
- Update EMHSD Pub. 207: "Local Hazard Mitigation Planning Workbook."

Committee Priority: HIGH (Ongoing)

Completion Target: 2016

Funding: EMPG, HMA, State Funding (General Fund)

Comments: 2014 status: This objective has had its priority elevated from MEDIUM to HIGH. Ongoing activities include the distribution of guidance materials, handling inquiries with appropriate information, conducting training sessions in multiple locations throughout Michigan, and outreach to interested college and university classes related to urban and regional planning. EMHSD Pub. 207 provides detailed guidance to agencies that develop local hazard mitigation plans, and it needs to be updated to reflect changes in federal planning regulations.

BC REVIEW: This objective is met by distribution (or web-posting) information, by attendance and presentations at meetings and appropriate conferences, or by the submission of materials to newsletters, electronic networks, or targeted publications. All these options entail only low-to-moderate staff, preparation, and travel costs, and the selected approaches can be readily adjusted over time to suit the current staffing and budget situations of the implementing agency. Thus, the benefits of this effort are very likely to outweigh the costs involved.

ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item addresses the mitigation of a full range of natural, technological, and human-related hazards.

Objective 4.2: Promote better information flow on hazard mitigation among agencies, between levels of government, and between public and private entities.

Implementation Method:

- Invite other state agencies and private industry to share their concerns, expertise, and ideas with the MCCERCC.
- Regularly publicize the MCCERCC's activities and actions using all appropriate means.
- Promote greater overlap between state and local planning activities.

Committee Priority: HIGH

Completion Target: 2016

Funding: EMPG, HMA, State Funding (General Fund)

Comments: 2014 status: Ongoing activity. Presentations by outside agencies and organizations are included as a regular part of the MCCERCC meeting agenda. MCCERCC meeting notices, meeting notes, and associated reports are made available (via the MSP/EMHSD web site) to a wide array of public agencies and nongovernmental organizations. In addition to the MCCERCC, the primary focus of this objective will include its component agencies such as MSP/EMHSD, which monitors and encourages the development of local hazard mitigation plans throughout Michigan. Although the MHMP is informed by local hazard mitigation plans, steps have been taken with the 2011 and 2014 revisions of MHMP to structure the document so that its structure has more in common with local plans. The forthcoming revision of EMHSD Pub. 207 (see Objective 4.1) will encourage local plans to refer more explicitly to information and objectives in the MHMP.

BC REVIEW: The activities in this objective can be encompassed within current and ongoing staff duties, and therefore should not impose significant additional cost upon the involved agencies. Therefore, the benefits that should be gained from the specified activities can be seen as cost-effective.

ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item refers to the mitigation of a full range of natural, technological, and human-related hazards.

Objective 4.3: Continuously revise and enhance the Michigan Hazard Mitigation Plan (MHMP) to ensure it remains current, accurate, relevant, implementable, and in compliance with the federal Disaster Mitigation Act of 2000 and the Emergency Management Accreditation Program (EMAP).

Implementation Method:

- Update the Michigan Hazard Analysis (EMHSD Pub. 103) during or before 2016, as a foundation for updating the MHMP and so as to maintain contact with partnering agencies and assist in more evenly distributing the coordination and feedback process across all parts of the three years available for MHMP update. (The hazard analysis forms approximately half of the content of the MHMP.)
- Integrate relevant data and findings from completed local hazard mitigation plans into the Risk Assessment and other appropriate plan sections.
- Keep the documents posted on the MSP/EMHSD web site, with appropriate staff contact information, so as to be continuously available for public review and feedback.
- Maintain contact with all partnering agencies, and collect information about plan monitoring, project implementation, new conditions, emerging hazards, climatological changes, emergency incidents, and other topics relevant to all types of hazards that could affect Michigan.
- Revise the Michigan Hazard Mitigation Plan to address the appropriate revision period.
- As feasible, establish enhanced collection and analysis systems for the following types of data:
  - Loss estimations for all relevant state owned/operated facilities.
  - Structure counts in floodplains, with particular emphasis on commercial structures.
  - Use of satellite and aerial photographs (now readily available online) for risk assessment purposes.
- Develop the information management capacity to utilize the HAZUS-MH risk assessment tool or to match its capabilities through other means.

Committee Priority: HIGH

Completion Target: 2016 (for hazard analysis, with full plan update due in March 2017)

Funding: EMPG, HMA, State Funding (General Fund)

Comments: Earlier plan editions were approved as federal DMA 2000 compliant on March 29, 2005, March 27, 2008, and March 26, 2011. Plan revisions are required every three years in accordance with the state mitigation plan standards set forth in the federal DMA 2000. 2014 status: The MSP/EMHSD oversaw the completion of a new edition of the Michigan Hazard Analysis in July 2012, with extensive review and input from its partnering agencies, and then oversaw the update of the Michigan Hazard Mitigation Plan by March 2014, when the earlier edition was scheduled to expire. A federal proposal was made to expand the update schedule from a 3-year cycle, to a 5-year cycle, to allow more staff time to be devoted to each update and to synchronize the state schedules with those of local community planning cycles. MSP/EMHSD strongly supports an expanded, 5-year update cycle, but as of this writing, no official confirmation has been received that an expanded schedule has been authorized. The newest MHMP revision benefited greatly from expanded technical analysis capabilities. Internal Geographic Information System enhancements and the expansion of online database and aerial photo archives have led to a substantial improvement in the capacity to analyze hazards. After the 2011 edition of the MHMP was completed, a substantial expansion of the Michigan Hazard Analysis was undertaken, with the assistance of multiple agencies and the MCCERCC. That update was completed and published separately in July 2012, but further revisions and expansion has again been completed for the March 2014 edition of the MHMP. MHMP remains an all-hazard document, and Michigan accreditation under EMAP was successfully obtained. Official EMAP compliance review is scheduled to occur during 2014 and 2015.

BC REVIEW: This objective is a normal part of the work of the MSP/EMHSD and MCCERCC and therefore does not entail any unusual expense for the state. However, since the MHMP is required for the receipt of numerous forms of federal disaster and hazard mitigation assistance, there is clearly a net benefit involved in accomplishing the task. This objective is required by FEMA in order to maintain eligibility for an array of grants, and this type of plan is considered to be a foundational activity for a good emergency management program. Therefore, the efforts of staff are considered to be well-justified in this activity.

ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The MHMP has continued to cover the fullest array of natural, technological, and human-related hazards, and consideration is continually given to emerging threats that might merit expanded or new detail in this plan.

Objective 4.4: Continuously monitor proposed legislation in Michigan for possible hazard mitigation opportunities and/or implications.

Implementation Method:

- Establish and maintain reporting relationships with state agency legislative liaisons so that mitigation-related aspects of proposed legislation are identified and reported to the MCCERCC.
- Establish and maintain a capability within the MSP/EMHSD to continuously monitor proposed legislation for hazard mitigation implications (using the key word notification mechanism of the Michigan Legislature web site or by other means).
- Establish and maintain reporting relationships with all applicable emergency management and first responder organizations so that mitigation aspects of proposed legislation are identified and reported to the MCCERCC.
- Establish liaison with the Michigan Legislative Service Bureau so that the following are identified and reported to the MCCERCC (to the extent possible): 1) mitigation-related aspects of legislation; and 2) the enactment, revision, and recession of Administrative Rules with mitigation implications.

Committee Priority: MEDIUM
Completion Target: 2019
Funding: EMPG, State Funding (General Fund)
Comments: 2014 Status: MSP now has dedicated staff who keep informed on legislation in Michigan, and initial contact was made by EMHSD staff to prepare for coordination on any forthcoming legislation that has emergency management implications, including hazard mitigation. Although this network link and its accompanying procedures still needs to be solidified, the effort has been bolstered by increased monitoring activities within EMHSD. These activities include extensive monitoring and internal distribution of media items related to MSP, expanded Public Information Officer capacity for the agency, and expanded capabilities for the MIOC. In addition to MSP/EMHSD requests that fire service and other emergency management and first responder organizations make the MSP/EMHSD aware of any proposed legislation that has emergency management implications, internal procedures for sharing information between MIOC, PIO, hazard mitigation planning specialists, and other staff are being put into place. Ideally, all MCCERCC members would similarly expand and connect their own legislative monitoring capabilities to those of MSP/EMHSD, and vice versa. However, it takes time to establish and strengthen these links to become a part of standard operating procedure. The issue of legislation monitoring should be revisited on an annual basis to ensure that all relevant notifications to the MCCERCC are being made in a timely manner.
BC REVIEW: Since certain staff now dedicate more time to this activity, it is hoped that this objective could be accomplished primarily through the development of (de facto) standard operating procedures that increase the level of information and communication among existing staff and agencies that already work with legislative and hazard mitigation concerns, and that the costs of such progress would not be great. In view of the important impact that legislation can have statewide, either to mitigate or to (unknowingly) exacerbate hazard risks and impacts, there should be a clear net benefit to be derived from this effort.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item refers to the consideration of means to mitigation the impacts of a full range of natural, technological, and human-related hazards.

Objective 4.5: Develop protocols for MCCERCC to solicit, accept, use/expend, and account for private sector donations for hazard mitigation purposes.
Implementation Method:

- Work with the Michigan Department of Technology, Management and Budget (MDTMB) and Michigan Department of State Police (MSP) Management Services to determine the guidelines and parameters for such activities to ensure compliance with state laws, rules and regulations.
- If determined to be feasible and allowable, develop standard protocols for soliciting, accepting, expending, using, managing, reporting on, and accounting for donations (financial and/or in-kind).
- Institutionalize the protocols in the MCCERCC Bylaws to ensure their continued and consistent use.
- As required, develop standardized forms to be used in the conduct of all required transactions (or identify existing forms that can be used).
- Report on the use and final disposition of donations in the MCCERCC Annual Report of Activities document.

Committee Priority: MEDIUM
Completion Target: 2019
Funding: EMPG, State Funding (General Fund)
Comments: 2014 status: The priority for this objective has been lowered to MEDIUM, since limited progress has been made on this objective due to lack of staff and competing work priorities. This objective is still valid and will remain

active for future implementation. This is a key building block for the future success of the MCCERCC when working with the private sector. It is important that a standard and consistent process be used when dealing with private sector entities, not only for appearances sake but also to ensure full compliance with applicable state laws, rules, regulations, and administrative / management mechanisms.
BC REVIEW: This objective would probably just involve the attention and coordination of personnel (possibly within multiple agencies) who have the expertise and time to investigate and compose recommendations on this matter. Since the may be significant additional revenues brought to bear to reduce hazard risks and vulnerabilities through this mechanism, the objective seems to be a highly cost-effective one to pursue.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.

~~Objective 4.6: Evaluate flood damage to and caused by failure of sewage handling systems.~~
Implementation Method:
- Convene a subcommittee of subject matter experts from applicable agencies to review this issue in recent flood events and develop solutions to identified problems.
- Implement the solutions where feasible.

Committee Priority: This objective has now been made a part of Objective 2.7.
Comments: The 409 Plan for Federal Disaster 774, October 1986, recommended creating a multi-disciplinary task force to evaluate this issue. This issue has surfaced in more recent flood disasters as well. 2014 status: Little progress has been made on this objective due to lack of staff and competing work priorities. This objective is still valid and will remain active for future implementation, but has been shifted into Objective 2.7, where it should be made a part of ongoing flood mitigation activities.

Objective 4.7: Identify and formally recognize local, tribal, regional, state, or private projects and initiatives that have successfully incorporated hazard mitigation concepts and/or exemplify sound hazard vulnerability reduction strategies.
Implementation Method:
- ~~Identify and review mitigation projects and initiatives annually to determine those that may warrant formal recognition.~~
- MSP/EMHSD will maintain a "Best Practices" document that recognizes hazard mitigation activities in Michigan.

Committee Priority: HIGH
Completion Target: 2016
Funding: EMAP, State Funding (General Fund)
Comments: 2014 status: With regard to bullet 1, the MCCERCC had studied the feasibility of establishing a formal award program for excellent in hazard mitigation and decided that it would be better to team with the Michigan Emergency Management Association (MEMA) to recognize outstanding mitigation efforts through its established mitigation award program. Therefore, at this time there will not be a separate MCCERCC mitigation award program so this action item will be removed from further consideration. With regard to bullet 2, the MSP/EMHSD and the MCCERCC had successfully developed a new publication, "Hazard Mitigation Best Practices: Michigan Success Stories," which identified and recognized outstanding accomplishments in reducing loss of life, property and environmental damage associated with natural hazards in Michigan. This document, MSP/EMHSD Publication 106a (in recognition of its close tie to the MHMP – Publication 106), will be periodically updated. Bullet 2 remains a valid and ongoing action item.
BC REVIEW: The costs of this objective are fairly modest, entailing staff time and input from relevant agencies. Since the "Best Practices" document helps to promote and recognize hazard mitigation efforts, it is expected to result in a net benefit in terms of prompting additional hazard mitigation projects in the future.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.

Objective 4.8: Highlight cost savings and other benefits to taxpayers due to mitigation measures that helped reduce future disaster damages.

Implementation Method:

- Regularly write and publish mitigation "success stories / best practices" highlighting the benefits of completed mitigation projects at the state, tribal, and local levels.
- Post the success stories / best practices document on the MSP/EMHSD web site (MCCERCC web page) and submit them to FEMA V for inclusion on the FEMA mitigation web site, as appropriate.
- ~~Consider producing a compendium of Michigan mitigation success stories / best practices and distributing it to the widest array of stakeholders possible.~~
- Include mitigation success stories / best practices in other MCCERCC reports, as appropriate.
- ~~Include mitigation success stories / best practices on the CD produced under Objective 1.1 (statewide mitigation marketing and education campaign) to reach several key stakeholder groups.~~

Committee Priority: HIGH
Completion Target: 2016
Funding: HMA, EMPG, State Funding (General Fund)
Comments: 2014 status: The MSP/EMHSD completed an initial publication, which was made widely available in multiple formats, including online posting. Since this document will be updated in the future, this objective continues to be listed as HIGH priority, even though its initial tasks have been accomplished. Two of the bullets listed in previous MHMP editions have been removed, to reflect progress that has been made and to reflect the greater effectiveness and efficiency of internet posting (rather than CD distribution).
BC REVIEW: This objective may be implemented through a variety of communications media, each with different associated costs. The posting of content on the internet, or in e-mail messages to selected networks or agencies that may help spread the information to others, has proven to be the cheapest method of distributing information, and therefore considered to be the most cost-effective. More expensive options include the use of broadcast media, the production and distribution of printed booklets and CD-ROMs, and having key spokespersons appear at conferences, public events, and in other newsworthy contexts. These are still used when appropriate opportunities are deemed beneficial. Due to the tertiary connection between this objective and the realization of demonstrated direct benefits (from hazard mitigation projects), the choice of promotional techniques usually favors the less expensive options, but all of these outreach activities also produce awareness and preparedness benefits, which add to their overall cost-effectiveness as an appropriate activity to promote.
ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.

Notes for Goals / Objectives:

THE OBJECTIVES UNDER EACH GOAL ARE NOT LISTED IN ORDER OF PRIORITY.

***Note on Committee Priorities:** The MCCERCC Hazard Mitigation Committee re-prioritized these plan objectives in late 2013. Priority rankings are as follows:

HIGH PRIORITY objectives are those slated for implementation during the next 2 years (by 2016), as resources and circumstances allow.
MEDIUM PRIORITY objectives are those slated for implementation during the next 5 years (by 2019), as resources and circumstances allow.
LOW PRIORITY objectives are those slated for implementation over the next 10 years (by 2024), as resources and circumstances allow. (Note: This ranking may also include projects that, because of their nature, will require a multi-year, phased implementation approach. These projects will be labeled "PHASED IMPLEMENTATION" to distinguish them from other projects that received a LOW PRIORITY ranking but that don't require a phased implementation approach.

****Funding Program Acronyms:**
EMPG = Emergency Management Performance Grant;
HMA = Hazard Mitigation Assistance
HMGP = Hazard Mitigation Grant Program;
PDMP = Pre-Disaster Mitigation Program;
FMAP = Flood Mitigation Assistance Program;
RFCP = Repetitive Flood Claims Program;
SRLP = Severe Repetitive Loss Program;
CAP = Community Assistance Program;
HSGP = Homeland Security Grant Program;
CDBG = Community Development Block Grants;
FEMA HMTAP = FEMA Hazard Mitigation Technical Assistance Program;
FEMA MMP = FEMA Map Modernization Program;
USDA = United States Department of Agriculture;
State Funding = Funds appropriated by the Michigan Legislature from the State General Fund; and
Private Funding = Funds provided by a private sector entity for hazard mitigation purposes.

****Notes on Comments for each Objective:** The comments column provides the following information about each objective, as appropriate: 1) the **RATIONALE** for each objective and how it contributes to the overall state mitigation strategy, 2) the **COST-EFFECTIVENESS, ENVIRONMENTAL SOUNDNESS, and TECHNICAL FEASIBILITY** of each objective, and 3) necessary background information to further explain the nature, scope, magnitude and/or intent of the objective.

Cost-effectiveness is described using a text description under the heading "BC REVIEW." Techniques for the review of benefits and costs (including qualitative techniques) is described in the FEMA "How To" guidance document FEMA 386-5, "Using Benefit-Cost Review in Mitigation Planning," dated May 2007. An important part of the BC concept established by FEMA is that the total benefits of a project are to be compared with its total costs, regardless of who receives these costs and benefits. Project costs are usually being considered with respect to the justifiability of applying federal funds. Thus, although a specific project may involve a substantial federal subsidy, the federal grant usually is not seeking a net benefit for its own budget, but rather is seeking an overall collective benefit, in the form of reduced damages and costs for all who may be affected or at-risk (not just the government).

Environmental soundness and technical feasibility are listed as either "Y" (yes) or "N" (no). Finally, some comments are added to clarify (or confirm) how the hazard mitigation objectives address a full array of natural, technological, and human-related hazards ("Multi-hazard").

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
1.5: Amend the State Fire Safety Code and code enforcement program to include all places of public assembly and congregation.	• Study the feasibility of amending the Code. • Amend the Code (if feasible). • Develop and fund a uniform statewide code enforcement program.	REMOVED	N/A	State Funding (General Fund)	BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y This objective was removed from the plan because it is not consistent with the hazard base currently addressed in the plan. State Fire Safety Code issues pertain primarily to the structural fire hazard, which is not addressed in the plan at this time. If the plan expands in future revision cycles to include structural fire and other technological hazards, this objective may be reinstated.
2.1: Integrate hazard mitigation into the comprehensive planning process at the local and regional levels.	Establish contact with the State Legislative Committee involved in preparing the "Coordinated Planning Act" to encourage the following: • Incorporate hazard mitigation into the comprehensive planning process at the local and regional levels by making it a required plan element. • Incorporate hazard area classifications into standard zoning classifications used in Michigan. • Permit county overlay zoning of designated hazardous river and stream corridors, hazardous transportation corridors, and intercommunity hazardous areas. • Require that County Drain Commissioners be included in the review and approval or disapproval of all land use change proposals – to include condominiums, development site plans, and mobile home parks (in addition to the existing review requirement for land subdivisions. • Require cross jurisdictional hydrologic planning between legal entities within watershed units.	SUBSTANTIALLY COMPLETED	2006	State Funding (General Fund)	Background: Several versions of this Act had been introduced in the Michigan Legislature in recent years but it was not enacted due to widely differing views on land use and local control issues. In 2003, Governor Granholm and Michigan legislative leaders convened the Michigan Land Use Leadership Council (MLULC) to conduct a comprehensive review of Michigan's land use and land development policies and their impact on the state's economy and quality of life. One of the recommendations of the MLULC was the consolidation and modernization of Michigan's antiquated planning and zoning enabling laws. The MHMCC made several specific recommendations to the MLULC on this issue in a letter dated July 15, 2003. On July 1, 2006, Michigan's three zoning enabling acts (one each for cities and villages, townships, and counties) were officially repealed and combined into one new statute, the Michigan Zoning Enabling Act (2006 PA 110). Although it is difficult to determine if any of the MHMCC recommendations were considered during the deliberations for the Act, the fact that it passed is a great step forward. The new Zoning Enabling Act appears to provide sufficient flexibility and regulatory framework to allow communities to effectively use comprehensive planning and zoning to reduce their natural hazard risk and vulnerability. (**Preparer's Notes:** Although the Zoning Enabling Act does not specifically address the three issues identified in the Hazard Mitigation Strategy for Federal Disaster 1128 (yellow highlighted bullet points in the far left column), there is little likelihood that these issues will be included in amended versions of the Zoning Enabling Act – at least in the foreseeable future – given the difficulty required to get even the basic consolidation and modernization of the Act in the first place. 2006 PA 110 was subsequently amended by 2008 PA 12 on February 29, 2008. No changes regarding hazard risk / vulnerability reduction. At the time of this writing, a companion bill to unify Michigan's planning enabling laws had been presented to the Governor for signature.) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
2.3: Implement appropriate mitigation measures to protect state owned / operated critical facilities and infrastructure from acts of sabotage and terrorism.	Possible mitigation measures include, but are not limited to: • Developing risk / vulnerability assessments of potential sabotage / terrorism threats. • Developing plans, strategies and procedures for mitigating identified vulnerabilities. • Enhancing personnel capabilities through site safety training, better equipment, improved information dissemination, increased numbers of personnel, etc. • Hardening of facilities to include design, construction and structural enhancements to prevent damage and the potential for injury or loss of life (i.e., stronger / fire resistant materials; use of shatterproof / glazed glass; better egress routes; reduced points of entry; increased "buffer" zones; etc.) • Physical security enhancements to include fencing, barriers, locking doors, lighting, cameras / monitors, motion detectors, alarms, computer firewalls, redundant security / communication systems, etc. • Security screening enhancements to include bio-threat detectors, metal detectors, x-ray machines, plastic explosive detectors, electronic ID card systems, optical / fingerprint scanners, etc.	REMOVED	ONGOING	HSGP State Funding (General Fund)	Ongoing effort, under the umbrella of the Michigan Homeland Security Strategy and in conjunction with the Michigan Homeland Security Preparedness Committee, Michigan Homeland Security Advisory Council, Michigan Homeland Protection Board, the MSP/EMHSD, and appropriate state agencies. With this homeland security structure in place, this objective would no longer fall under the purview of the MCCERCC. BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y
2.4: Amend the State Construction Code to include, where appropriate, hazard mitigation measures designed to enhance wind, flooding, snow load and fire protection provisions.	• Establish a new statewide building code based on the national consolidated code.	COMPLETED	2000	State Funding (General Fund)	New statewide code established and implemented under 1999 PA 245. The code has adequate provisions for wind, flooding, snow loads and fire protection.
2.6: Amend Part 31 of the State Floodplain Regulatory Authority to address the "grandfather" clause that allows continued floodway occupation as long as the size of the structure is not increased.	• Amend the Part 31 Rules.	REMOVED	ONGOING	EMPG CAP State Funding (General Fund)	Objective merged (with old Objective 2.6, current Objective 2.4) to include all desired modifications to the Part 31 Rules.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
2.8: Incorporate hazard mitigation factors into the design review process for construction or major modification of all state owned / operated critical facilities.	• As part of the MHMP revision process, identify state owned / operated critical facilities occupying floodplains, floodways, subsidence areas, high risk erosion zones, earthquake zones and other known, location-specific natural and technological hazard areas. • As part of the MHMP revision process, estimate potential losses to state owned / operated critical facilities for all relevant natural, technological and human-caused hazards. • Based on the results of the MHMP Risk Assessment process, conduct detailed follow-up studies of vulnerable facilities to identify the most appropriate mitigation measures for each facility, given its level of vulnerability, potential losses, facility design and function, etc. Specifically address the following identified concerns: ➢ Determine the first floor elevations of facilities in identified floodplains and other potential flood prone areas. Determine if facilities should be flood proofed, elevated, or relocated, or if drainage should be improved, as the most appropriate mitigation option. ➢ More precisely identify facilities that are vulnerable to subsidence by conducting site-specific geological surveys to determine the presence of abandoned and unmapped underground mines. • Based on the results of these detailed studies, select the most appropriate mitigation measures and strategies for each facility in order to minimize future disaster damage. • Implement identified measures and strategies where possible, based on available resources. • Through the MDTMB representative on the MHMCC, encourage state agency personnel involved in the design review process for future construction or major modification of state facilities to advocate for hazard mitigation measures whenever practical. • Revise and enhance the State Flood Hazard Mitigation Plan (Executive Order 1977-4) to prevent, where possible, the locating of state facilities in floodplains, floodways or other known hazardous areas.	SUBSTANTIALLY COMPLETED	2005	EMPG State Funding (General Fund)	The MHMCC Legislative and Special Projects Committees, working with the Governor's Office, developed Executive Directive 2001-5 (signed on September 11, 2001) which directs the MDEQ to work with the MHMCC and other state agencies to develop a statewide, interagency flood mitigation strategy to assure compliance with Executive Order 1977-4. The new Directive will re-focus state agency efforts on sound floodplain management practices in the coming years. (Completed) State owned / operated critical facilities identified as part of the 2004 MHMP revision. (Completed) Potential natural hazard losses estimated for state owned / operated critical facilities as part of the 2004 MHMP revision. (Completed) A detailed follow-up study of vulnerable state owned / operated critical facilities would help to determine the types of "brick and mortar" projects that would be required to permanently reduce any identified facility vulnerabilities to flooding. However, such a study would absolutely require a FEMA HMTAP contract (at 100% federal share) in order to be conducted and properly analyzed by the next scheduled plan revision (2011). This study may be undertaken as time, circumstances, and resources permit. Refer to new Objective 2.6. (Note: no state owned / operated critical facilities are located within high-risk erosion zones, and the potential losses to state owned / operated facilities from earthquake were determined to be negligible. No follow-up mitigation actions are required for these two hazards.) For follow-up studies and planning: BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y For selected mitigation actions, based on the study results: BC REVIEW: + (only cost-effective actions will be implemented) ENVIR SOUND: Y (only environmentally sound actions will be implemented) TECH FEASIBLE: Y (only technically feasible actions will be implemented)

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
2.11: Study methods to map all floodplains in Michigan to current FEMA / MDEQ standards.	• Maximize MDEQ participation in FEMA's Map Modernization Program. • Maximize local participation in the Cooperating Technical Partner (CTP) Program with the MDEQ.	COMPLETED	2007	FEMA MMP CAP State Funding (General Fund)	The MDEQ is fully engaged in the FEMA Map Modernization Program and the CTP. These efforts should yield updated floodplain maps statewide within the next few years. BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y
2.20: Encourage and provide technical assistance to communities to use CDBG funds for implementing water and sewer freeze resistance measures.	• Work with the Michigan CDBG Program to determine which types of projects would be eligible for funding consideration under the Rebuild Michigan and other similar programs. • Provide that information to communities statewide via informational letter, web posting, or other appropriate method. • Establish a monitoring system with the CDBG Program to determine the number of freeze related projects that have been funded.	COMPLETED	1996	CDBG EMPG State Funding (General Fund)	Reliable water and sewer infrastructure is vital to community economic development and job creation and retention. CDBG funds were used to implement 12 water and sewer infrastructure freeze protection projects within the declared area for Federal Disaster 1028. The total CDBG investment in these ground freeze mitigation projects was $5.7+ million. BC REVIEW: + ENVIR SOUND: Y TECH FEASIBLE: Y
2.22: Develop hazard mitigation plans (in coordination with local comprehensive plans if possible) in all local emergency management program jurisdictions.	• Develop and distribute planning guidance. • Provide technical assistance as needed. • Collect and compile pertinent data related to the planning effort. • Provide direct assistance in writing plans as needed. • Review and certify completed plans. • Submit plans to FEMA for final certification.	SUBSTANTIALLY COMPLETED	2008	HMGP FMAP PDMP EMPG	HMGP Project under Federal Disaster 1346. PDMP and FMAP funds also being used in plan development. Goal: develop local mitigation plans that cover all counties and major municipalities in Michigan. Major work project for 2002-2008. (Ongoing) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y
3.4: Increase the statewide NFIP policy base to more accurately reflect the flood hazard threat in Michigan.	• All implementation methods listed under Objective 3.3 are also valid under this Objective.	CONSOLIDATED	N/A – ONGOING ACTIVITY	EMPG HMGP FMAP CAP State Funding (General Fund)	Combined with Objective 3.3. Generally, the MDEQ targets its NFIP promotional activities at those communities that have the greatest flood risk. These flood prone communities are a higher priority for promotional activities than are communities with less of a flood risk. (Ongoing) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
3.6: Identify and implement mitigation measures that could reduce or eliminate the threats to life and property from hazardous material fixed site and transportation accidents.	• Study possible methods and mechanisms for expediting the completion of SARA Title III off-site response plans required for each Section 302 site. • Develop strategies to integrate local emergency management planning and SARA Title III hazardous material response planning into local comprehensive planning efforts. (See Goal 2 – Reduce Property Damage – for additional information on this activity.) • Consider integrating local hazardous material planning efforts (via the LEPCs) into the "Michigan Safety First Community" initiative described in Objective 3.1. • Develop strategies for assisting LEPCs in proactively examining 302 sites to reduce chemical inventories (where feasible) and the resultant risks to human life and property.	REMOVED (NOT WITHIN PURVIEW OF PLAN)	N/A	EMPG State Funding (General Fund)	Federal HMEP and HSGP funding has been used to facilitate the completion of some SARA Title III Section 302 plans. Approximately 75% of the 2,749 Title III Section 302 sites in Michigan have a completed offsite response plan. Many of those completed plans will need to be updated over the next several years. (Ongoing) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y This objective was removed from the plan because it is not consistent with the hazard base currently addressed in the plan. If the plan expands in future revision cycles to include hazardous material incidents and other technological hazards, this objective may be reinstated.
4.3: Develop efficient, effective, fair and impartial hazard mitigation project identification, solicitation, review, prioritization and selection processes.	• Develop a project identification and solicitation system that can be tailored to meet the needs of each disaster situation, and that results in the submittal of an adequate number of high quality mitigation projects. • Develop a mitigation resource matrix / manual so that all potential and appropriate funding programs are considered when prioritizing projects. • Develop a project prioritization system that includes current and relevant review criteria and clear-cut scoring options.	COMPLETED	2008	EMPG HMGP FMAP PDMP State Funding (General Fund)	The MCCERCC and MSP/EMHSD have developed fair and impartial project identification, solicitation, review, prioritization and selection processes related to the HMGP, FMAP, PDMP, RFCP, and SRLP. The "Funding Sources for Hazard Mitigation" guidance document (MSP/EMHSD Publication 207A and a supplement to the Michigan Hazard Mitigation Plan) was updated for the 2008 MHMP revision. (This voluminous publication can be used to identify possible alternative funding sources for hazard mitigation projects.) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y
4.4: Promote multi-objective results on all hazard mitigation projects and initiatives.	• Make multi-objective results one of the criteria used in the prioritization of projects for funding under the HMGP, PDMP, FMAP, RFCP, and SRLP.	COMPLETED	2008	HMGP EMPG FMAP PDMP State Funding (General Fund)	The achievement of multiple objectives is now institutionalized under the review criterion "Consistent with Other Initiatives?" in the prioritization of projects for funding under the HMGP, PDMP, FMAP, RFCP, and SRLP.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2005 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
4.8: Develop a staffing pattern for adequately addressing state and local hazard mitigation functions, and pursue funding of needed mitigation positions.	• Prepare and submit staffing plans for funding under HMGP State Management Costs, as disasters occur. • Prepare and submit staffing plans for funding under PDMP State Management Costs, as annual funding cycles occur. • Develop and maintain mitigation position descriptions that accurately reflect the nature, scope and magnitude of work required in each position. • Identify (and pursue, as appropriate) other funding sources that could be used to fund hazard mitigation positions.	COMPLETED (BUT REQUIRES ONGOING MAINTENANCE TO SUSTAIN CAPABILITY)	N/A – ONGOING	HMGP and PDMP Management Costs EMPG FMAP State Funding (General Fund) Private Funding (Partners TBD)	The MSP/EMHSD has successfully used HMGP State Management Cost funding in the past to staff needed positions related to grants management, planning and administrative support. Those positions were initially limited term positions but have all been converted to permanent positions, providing the long term continuity required to adequately address and sustain hazard mitigation functions on a permanent basis. It is imperative that stable, continuous funding sources be identified to provide for the continuation of these hazard mitigation positions. Otherwise, staff may be re-assigned to other functions within the division. BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y
4.14: Increase the proportion of full-time, paid professional firefighters within the state fire service.	• Consider legislation creating a state fire fund to provide supplemental funding to hire and train full-time firefighters. • Study the feasibility of establishing more full-time public safety officer positions within Michigan local jurisdictions.	REMOVED (NOT WITHIN PURVIEW OF PLAN)	N/A	State Funding (General Fund)	(Note: Public safety officers are generally combination EMTs, police officers, and firefighters.) BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y This objective was removed from the plan because it is not consistent with the hazard base currently addressed in the plan. The issue of full-time fire service staffing pertains primarily to the structural fire hazard, which is not addressed in the plan at this time. If the plan expands in future revision cycles to include structural fire and other technological hazards, this objective may be reinstated.
4.17: Study the floodplain service program of MDEQ to determine appropriate staffing levels, given current and projected service requests.	• MDEQ budgetary process. • Federal CAP budgetary process.	COMPLETED (BUT REQUIRES ONGOING MAINTENANCE TO SUSTAIN CAPABILITY)	N/A – ONGOING	CAP State Funding (General Fund)	Current and projected service requirements related to floodplain management will be considered as part of the normal MDEQ and CAP budgetary processes. Requirements for additional staff will be addressed within those two separate, yet related processes. BC REVIEW: N/A ENVIR SOUND: Y TECH FEASIBLE: Y

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 1.5: Establish / enhance anchoring requirements for oil, gasoline, and propane tanks, and paint, chemical barrels in known flood hazard areas.	• Study the feasibility of amending State Administrative Rules to include comprehensive anchoring requirements for all land uses in known flood hazard areas. • Amend the Administrative Rules (if feasible).	REMOVED	N/A	State Funding (General Fund)	2011 status: This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: The anchoring of tanks and barrels is relatively cheap, and under flood conditions may prevent the complete loss of the substances they contain, as well as a reduction in potential liability from damages that may be caused by loose tanks and barrels as they float away. When the costs of environmental contamination, cleanup, and liability are compared with the relatively cheap costs of anchoring, the cost-effectiveness of this measure seems apparent. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant for technological hazards.
Objective 1.7: Establish / enhance state disclosure provisions for flood prone areas (require the status of all buildings located in floodplains be disclosed as a condition of financing from a financial institution).	• Study the feasibility of legislation to strengthen disclosure provisions under state law (Seller Disclosure Act, 92 PA 1993, as amended). • Consider within that legislation a provision to prohibit construction of public buildings within the floodplain except those required to meet specific needs within the floodplain.	REMOVED	N/A	State Funding (General Fund)	The 1994 Flood Insurance Reform Act requires banks to ensure that flood insurance policies are issued on all structures on which they write loans that are located in the floodplain. The seller of the structure must file a disclosure form with the realtor. However, this requirement only applies to federally insured banks and does not apply to land contracts or state chartered banks. Therefore, disclosure provisions do not apply to all financial transactions involving homes located in floodplains. In addition, if an area is not mapped for floodplains, then no disclosure of flood liability can be required. A further problem lies in the current version of the disclosure forms that permit an "I don't know" answer to the question of location in a floodplain. 2011 status: This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Although this is more of a regulatory proposal than an action with a specific associated cost, the benefits should be substantial in promoting an awareness of (and therefore mitigation of) flood risks, which could no longer simply be passed, *caveat emptor*, to a different (and unsuspecting) property owner. Although there would be administrative costs associated with such regulations, real estate buyers would be more likely to purchase property at a price that better reflects its true value and thus realize substantial savings and benefits for property buyers. At this current time, when Michigan faces the risk of a net population loss, a provision which provides reassurance to property buyers may also be a useful mechanism to use in trying to attract new residents. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is specifically directed toward flood awareness and mitigation, but since flooding can lead to the secondary impacts of infrastructure failure, transportation accidents, and hazardous material incidents, and since flood conditions can impede the ability to respond to fires, storms, and other emergency events, flood awareness and prevention efforts can be considered to also serve as prevention for the secondary impacts that a flood can cause.
Objective 1.8: Study the feasibility of requiring all manufactured homes to be tied down (structurally anchored), not just those in designated floodplains, to prevent wind and water rollovers.	• Work with the MDLEG Manufactured Housing Commission to study the feasibility of such a proposal. • Assist in promulgating rules to require universal tie downs (if feasible).	REMOVED	N/A	State Funding (General Fund)	New manufactured homes are required to have an anchoring system installed at the time of building. However, older, existing mobile / manufactured homes are not covered under this requirement. 2011 status: This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Part of the feasibility study could include a consideration of overall costs (to private owners, park operators, insurance agencies, and any other involved stakeholders) compared to the expected benefits of substantially reduced property damage amounts. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This particular item is aimed at specific natural hazards, although it is worth noting that any actions that protect people's homes has the corollary effect of maintaining the capacities for in-place sheltering and protection that may be appropriate for certain types of technological emergencies, such as those involving a radiological or chemical release. In addition, by maintaining the integrity of residential units, the capacity of the state to house its residents, plus any evacuees from a national emergency event (i.e. Hurricanes Katrina and Rita in 2005) is maintained and bolstered. Every residential unit left intact after a disaster means a lessened number of residents that may need sheltering, and may also result in an additional capacity to house those who have been displaced from their own homes.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 1.9: Revise the Michigan Hazard Analysis to address the years 2006-2008.	• Collect, compile, analyze and synthesize hazard data for the period 2006-2008. Incorporate hazard data from local hazard analyses / risk assessments and mitigation plans as appropriate. • Revise the document format and content as required to reflect the state's current hazard base, state / national / international conditions, and changes in state / federal laws, regulations, policies, programs, and funding. • Develop and distribute the revised document. • Incorporate findings into the 2011 revision to the Michigan Hazard Mitigation Plan. (Note: revised plan must be federally approved by March 28, 2011.) • Note: Implementation of this project is contingent upon additional state planning staff for the MSP/EMHSD.	COMPLETED	2010	EMPG, HMGP, PDMP, State Funding (General Fund)	2011 status: This objective has been completed for the specified time period. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: The regular updating of Michigan's hazard mitigation documents is clearly cost-effective not only because of the usefulness of these documents to emergency management programs throughout the state, but because of the substantial amount of federal funding whose availability is contingent upon maintaining these documents to the required standards. The staff time of key workers in State government, plus those external parties who review and provide input into the process, is offset by federal support for such planning efforts, and by saving other agencies the substantial resources (and redundancy) that would be involved were they to all independently investigate and analyze the subjects from scratch, on their own. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The Michigan Hazard Analysis describes all significant hazards known to affect Michigan, from an emergency management perspective. The Michigan Hazard Analysis document, previously published in 2006, has had its natural hazard sections updated and published in the 2008 Michigan Hazard Mitigation Plan. In 2010, all the remaining hazard sections were updated for the EMAP Hazard Analysis Annex to the Michigan Hazard Mitigation Plan. These are currently being consolidated into the 2011 Michigan Hazard Mitigation Plan update, in which this objective will be revised to refer to the publication of these updated sections as a separate Michigan Hazard Analysis document during 2011.
Objective 1.10: Develop and widely publish a recommended listing of "safety / preparedness gifts" that could be purchased for Christmas, birthdays, and other special occasions, to improve personal and family safety and preparedness in a disaster or emergency.	• Establish a committee of emergency management and human service agencies to develop a list based on current family preparedness guidance. • Identify private sector partners that might be interested in assisting with mass dissemination of the list.	COMPLETED	2010	HMGP, PDMP, Private Funding	The list could be published in paper format, posted on the MSP/EMHSD web page, advertised in the media, and distributed at home centers and other retail outlets. The list would support and expand upon FEMA's Family Protection concept (being self-sufficient for 72 hours). The list could be sent out under cover of a press release during the Christmas shopping season and at other appropriate times during the year. 2011 status: This objective has effectively been addressed by the MSP/EMHSD "Do One Thing" and "Be Prepared Be Safe" preparedness initiatives (and by link, the federal "Ready.Gov" web site), which advocate and provide guidance for the purchase and stockpiling of safety / preparedness gifts as a basic family preparedness measure. No further activity is required on this objective. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Given the ability to cheaply distributed such information electronically, the costs involved in producing such a list would mainly amount to some staff time on the part of selected state employees (or the adaptation, with permission, of some similar listing that may already have been produced by another agency). As with other forms of public education and awareness building on the subjects of safety, preparedness, and hazard mitigation, the expense involved in accomplishing this task would likely be considered justifiable if even a single death was prevented as a result of such a campaign. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The recommended listing would not be limited only to natural hazard preparedness, so this item is appropriate for addressing all hazards.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 2.2: Develop, construct, and operate (in conjunction with other appropriate entities) a Michigan "Safety House" demonstration model to provide a training and information focal point for builders, building officials, code enforcement officers, engineers, community planners, public works agencies, drain commissioners, and the public on safe, sustainable and disaster resistant building materials and construction techniques.	• Revise existing MSP/EMHSD concept paper for use as an educational and "selling" tool for potential partners in the venture. • Identify and approach potential venture partners to gain support and commitment for the concept. • Determine size and scope of demonstration model (i.e., full-size structure vs. smaller scale demonstration model) per the options discussed in the concept paper. • Determine construction and operational costs. • If feasible, develop a plan of action for constructing the model. • If a full-size structure is built, develop a plan of action for maintenance and operation of the facility.	REMOVED	N/A	HMGP, PDMP, Private Funding	MSP/EMHSD developed the original concept paper during FY 01. A full-size facility could serve as a focal point for hazard mitigation activities within the State of Michigan. 2011 status: No additional progress has been made on this objective due to lack of staff and competing work priorities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: A model will help to demonstrate the feasibility and benefits of disaster-resistant construction. If such construction can be encouraged and its implementation increased "in the field," then the costs of developing the model will pay off in the increased durability and damage-resistance of actual structures that eventually experience threatening conditions. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The "disaster resistant" concept is relevant for all types of hazards.
Objective 2.3: Amend Part 31 of the State Floodplain Regulatory Authority to address 1) concerns pertaining to permits for filling or construction within the floodplain of inland lakes, and 2) the "grandfather" clause that allows continued floodway occupation as long as the size of the structure is not increased.	• Study the feasibility of amending the Part 31 Rules. • Amend the Part 31 Rules (if feasible).	COMPLETED	N/A – ONGOING	EMPG, CAP, State Funding (General Fund)	Part 31 rules have been rewritten and are undergoing internal and external review for possible further modification. The current draft of these rules addresses construction in floodplains of lakes as well as structures in floodways that are currently protected by the grandfather clause. (Ongoing) 2011 status: This objective has effectively been addressed by the above-referenced Administrative Rules. No additional amendments are likely or planned for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Although certain costs may be incurred by particular persons or parties, the intention is to realize much greater collective benefits, even if such circumstances turn out to require case-by-case evaluation. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is aimed toward the flood hazard, but can also help to alleviate secondary impacts of flooding that may involve other types of hazards (e.g. infrastructure failure, public health emergencies, etc.).

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 2.4: Study methods to incorporate hazard mitigation considerations into the design of new and substantially improved public infrastructure to ensure disaster-resistance and structural integrity.	• Conduct a comprehensive study of federal and state regulatory mechanisms related to the design, engineering and construction of public infrastructure. • Study the feasibility of amending state codes, standards, rules and permitting processes for public infrastructure to incorporate or enhance disaster-resistant practices. • Amend codes, standards, rules, and permitting processes (if feasible). • Develop and adopt minimum standards for drain design and construction as part of the effort to revise the State Drain Code.	CONSOLIDATED	N/A – ONGOING	HMGP, State Funding (General Fund)	Possible areas of emphasis include (1) Electric utility infrastructure – wind, ice, and snow resistance, (2) Water and sewer infrastructure – ground freeze resistance, (3) Drain infrastructure – storm water carrying capacity, damage resistance. 2011 status: This objective is being addressed by the statewide mitigation marketing / education project described in Objective 1.1; therefore, this objective will be eliminated. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Staff and coordination time will be required, to explore the benefits of hazard-oriented infrastructure improvements. Since this infrastructure tends to serve many thousands of persons, however, it can be assumed that in at least some communities, a favorable set of benefits would be realized that offsets the costs of the redesign and improvement activities. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is not limited to natural hazards. For example, substantial consideration has been given in recent years to the "hardening" of critical facilities and infrastructure against terrorism and sabotage.
Objective 2.7: Amend Part 315 of the Natural Resources and Environmental Protection Act to regulate development downstream of a dam through analysis of the dam's hydraulic "shadow."	• Study the feasibility of amending Part 315 of the Act. • Amend Part 315 of the Act (if feasible).	REMOVED	N/A	CAP, State Funding (General Fund)	There are no current restrictions to occupation of areas below a dam. Amendments may be needed in the Dam Safety Act to identify that there is a hydraulic shadow below each dam and that development therein is at risk in case of a dam failure. At present, local zoning authority can prohibit building in the hydraulic shadow but that does not always occur. An alternative to the legislative amendment would be a vigorous educational campaign targeted at local zoning administrators and other community officials. (Ongoing) 2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Although some decline in property values may be incurred in certain locations, there would certainly be higher-risk locations for which any such decline (which may be difficult to definitively measure) is clearly offset by a lessened degree of vulnerability. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is specific to the dam failure hazard, and dam structures themselves may be considered a technological hazard, such as infrastructure failure.
Objective 2.8: Study the implications of instituting statewide watershed management to enhance local and state flood management efforts in Michigan.	• This issue is being considered as part of the overall effort to amend the state planning enabling legislation (the "Coordinated Planning Act"). • Consider conducting a separate study of this issue, in conjunction with the Michigan Association of Regions, the Michigan Association of Planning, and other appropriate professional groups.	REMOVED	N/A	HMGP, FMAP, CAP, State Funding (General Fund)	Watershed management / cross jurisdictional hydrologic planning between legal entities within watershed units is currently being studied as part of the overall effort to enact the Coordinated Planning Act. However, there is no guarantee that this issue will be fully addressed or addressed at all in that larger effort. Therefore, it may be necessary to conduct a separate study on this issue to ensure that it is fully considered. 2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Although a new program may at first appear to entail significant expense, it is likely that efficiencies would be realized by being handled at the state level. The nature of watersheds automatically makes them a multi-jurisdictional responsibility that may take some trouble to coordinate and act upon at the local level, especially if funding and staff time is found to be in short supply. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: Watershed management includes the alleviation of multiple types of secondary effects from flooding.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 2.9: Conduct a study of Michigan's land character and its influence on storm water runoff – to facilitate the development of a land coverage formula for Michigan based on soil character.	• Digitize soil surveys of all Michigan counties to show and determine soil erosion potential and soil water holding capacity. (From this effort, a formula can be developed to calculate the maximum recommended land coverage for impervious surfaces. Soil characteristics, slopes and vegetation types will be considered in the development of this methodology.)	REMOVED	N/A	HMGP, PDMP, State Funding (General Fund)	This project was initiated with two HMGP projects under Federal Disasters 1128 and 1181 ($442,853 in project investment to date). Soil surveys for a total of 11 east central Michigan counties were digitized under this effort by the Michigan Department of Agriculture and Rural Development (MDARD). Additional work will be completed for other areas of the state as time and resources permit. 2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: This is another case in which the size of the task would become substantially easier to manage as the extent and quality of statewide digital data sets continues to develop. At a point when topographic, hydrologic, and other data can be readily integrated using a Geographic Information System, the staff time and resources needed to accomplish this type of task (in tight budget times) should become affordable enough to provide confidence that the net benefits realized from the effort will be substantial enough to offset the costs of the project. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is directed primarily toward flood prevention (and may also be useful for the handling of droughts).
Objective 2.10: Promote the establishment of minimum setback requirements for agricultural drainage ditches.	• Develop and distribute guidance (through the Michigan Cooperative Extension Service and/or related organizations) on "best practices" for greenbelts along agricultural drainage ditches. • Study the feasibility of legislation requiring a state setback standard. • Study the feasibility of legislation allowing for acquisition of buffer strips, or easement rights through tax abatement or other financial mechanism. • Seek legislation for both (if feasible).	REMOVED	N/A	HMGP, EMPG, State Funding (General Fund)	May also want to consider developing a slogan emphasizing the need to keep the edges of drainage ditches "green" to prevent sedimentation and exacerbation of flood hazards? 2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Taking a regulatory approach to a statewide effort such as this helps to spread thin the costs of this type of change, so as to be less heavy for any particular agency or location, and thereby likely to result in net benefits overall. This is particularly true when the regulations tend primarily just to improve the quality of future decisions, rather than to require the correction of past mistakes. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused on flood prevention, which may also prevent various types of secondary impacts from flooding.
Objective 2.11: Develop and distribute detailed maps showing drains and their flow direction, to assist in disaster response actions associated with liquid pollutants.	• Digitize drainage channels of all Michigan counties to show drain routes, characteristics and flow direction. • Work with county road commissions to have drain routes and flow direction included on official county road maps. • Work with county planning departments and regional planning commissions to have drain routes and flow direction included on county land use and zoning maps.	REMOVED	N/A	HMGP, State Funding (General Fund)	Once fully digitized, drain routes should be included on county road maps and county land use / zoning maps to assist local responders during liquid pollutant emergencies involving drains. 2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Digital data has probably now advanced to the point where the staff and resource requirements for this objective are now much lighter (the use wall-to-wall aerial photo coverage and topographic information within a Geographic Information System) and therefore the task would become more clearly beneficial in terms of the realization of net benefits across the state. Although certain higher-risk areas might be focused upon, advances in digital technology may allow the entire state to be analyzed without too much additional cost. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant to technological hazards involving hazardous materials, and may also relevant to human-related hazards involving public health emergencies, contamination, or deliberate sabotage/terrorism.
Objective 2.12: Develop and establish design, construction, and maintenance guidelines for dikes and levees protecting agricultural land.	• Develop and distribute (through the Michigan Cooperative Extension Service and/or related organizations) guidelines that incorporate current engineering and maintenance "best practices" for agricultural dikes and levees.	REMOVED	N/A	State Funding (General Fund)	2011 status: Additional progress on this objective has been slowed due to lack of staff, competing work priorities, and political and fiscal realities. This objective is not feasible given current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: The costs would primarily be the staff time involved in researching, producing, and promoting the adoption of these guidelines. Web-publication of such guidelines would be quite inexpensive, but likely to result in safety improvements in at least some of the state's many agricultural areas. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused upon flood control infrastructure, which involves both natural and technological components. Consideration will be given to the expansion of this item to include a reference to the protection of such critical infrastructure from sabotage/terrorism, which makes the topic also relevant for human-related hazards.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 2.13: Increase awareness of community officials about state codes and standards for water and sewer systems, and the permit processes for system alterations, to prevent frost damage to new and existing infrastructure.	• Issue MDEQ guidance to local communities on a regular basis, with special emphasis placed on ground freeze mitigation. • Include the guidance in the MSP/EMHSD Statewide Mitigation Marketing and Public Education Project under Federal Disaster 1346, which is targeted at seven professional groups that influence mitigation decisions at the local level. (Public works officials are one of the seven targeted groups.) • Fully integrate ground frost damage prevention measures into all system master plans and the permitting process for system improvements and alterations.	COMPLETED / CONSOLIDATED	N/A - ONGOING	HMGP, PDMP, State Funding (General Fund)	2011 status: Bullet 2 is being addressed by Objective 1.1 (mitigation marketing / education campaign for target groups). Bullets 1 and 3 are part of ongoing system monitoring and regulation efforts by the MDEQ to ensure the structural and operational integrity of water and sewer systems against natural, technological and human-caused hazards. This is an ongoing, established process that has been strengthened in emphasis since Michigan's infrastructure "freeze disaster" (Federal Disaster 1028-DR-MI in 1994) and is adequate to meet the State's needs in this area. For these reasons, this objective is being removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: This objective can be served by the distribution (or web-posting) of information, or by attendance/presentations at meetings and appropriate conferences, or by the submission of materials to newsletters, electronic networks, or targeted publications. All these options entail only low-to-moderate costs, and the selected approaches can be readily adjusted over time to suit the current staffing and budget situations of the implementing agency. Thus, the benefits of this effort are very likely to outweigh the costs involved. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item relates directly to technological hazards involving infrastructure failure (even if the ultimate cause of that failure stems from weather hazards), and this infrastructure is also relevant for the human-related hazard of public health emergencies.
Objective 2.14: Develop water system master plans that adequately address ground freeze protection for those communities that don't presently have such plans.	• Work with the MDEQ to determine which communities in Michigan do not have water system master plans that adequately address ground freeze protection. • Determine the most appropriate method(s) for providing technical assistance to complete a master plan. • Study the feasibility of using HMGP and/or PDMP planning funds to provide technical assistance for completing master plans that feature freeze resistance as a plan component.	COMPLETED	N/A – ONGOING	HMGP, PDMP, State Funding (General Fund)	A water system master plan can help communities develop and implement both short and long-range preventive measures for ground frost damage. 2011 status: Bullets 1 and 2 are part of ongoing system monitoring and regulation efforts by the MDEQ to ensure the structural and operational integrity of water and sewer systems against natural, technological and human-caused hazards. This is an ongoing, established process that has been strengthened in emphasis since Michigan's infrastructure "freeze disaster" (Federal Disaster 1028-DR-MI in 1994) and is adequate to meet the State's needs in this area. Bullet 3 is not feasible because of fund work eligibility restrictions and because other funding sources exist for this type of assistance. For these reasons, this objective is being removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Coordination would need to take place to determine which systems have need, and how such plans could most efficiently be developed. This would probably vary from jurisdiction to jurisdiction, and the focus might fall upon those jurisdictions that seem to have the most urgent need, thus allowing a reasonable certainty that the involved efforts will result in positive benefits. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item relates directly to technological hazards involving infrastructure failure (even if the ultimate cause of that failure stems from weather hazards), and this infrastructure is also relevant for the human-related hazard of public health emergencies.
Objective 2.15: Establish formal "let run" policies and procedures to keep water moving through a community's system to prevent freezing during periods of extended or extreme cold weather.	• Issue MDEQ guidance to local communities on a regular basis, with special emphasis during extended periods of extreme cold temperatures. • Include the guidance in the MSP/EMHSD Statewide Mitigation Marketing and Public Education Project under Federal Disaster 1346, which is targeted at seven professional groups that influence mitigation decisions at the local level. (Public works officials are one of the seven targeted groups.) • Fully integrate let-run policies and procedures into all system master plans.	COMPLETED / CONSOLIDATED	N/A – ONGOING	State Funding (General Fund)	Community let-run actions are initiated and terminated locally, with little uniformity or consistency. Development of formal state guidelines would help ensure that let-runs do not adversely impact water and wastewater treatment operations and community fire suppression capabilities. 2011 status: Bullet 2 is being addressed by Objective 1.1 (mitigation marketing / education campaign for target groups). Bullets 1 and 3 are part of ongoing system monitoring and regulation efforts by the MDEQ to ensure the structural and operational integrity of water and sewer systems against natural, technological and human-caused hazards. This is an ongoing, established process that has been strengthened in emphasis since Michigan's infrastructure "freeze disaster" (Federal Disaster 1028-DR-MI in 1994) and is adequate to meet the State's needs in this area. For these reasons, this objective is being removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Although some water is used with this practice (and thus causes an expense), the damages caused by frozen pipes can be disastrous, and so the expense of this preventive practice has been determined to be justifiable. The establishment of formal policies would probably not cause very great expense to any particular stakeholder (although such things could be explored during the actual process of establishing these policies and procedures). ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item relates directly to technological hazards involving infrastructure failure (even if the ultimate cause of that failure stems from weather hazards), and this infrastructure is also relevant for the human-related hazard of public health emergencies.
Objective 2.16: Determine if the State's cold weather engineering practices and standards are sufficient to mitigate water and sewer infrastructure freeze failure.	• Research and determine cold weather engineering "best practices" for water and sewer infrastructure (if different from current MDEQ practices and standards). • Determine additional costs of following the higher engineering standards and practices. • If the higher standards and practices are feasible, work with MDEQ to incorporate those standards and practices into current State codes, standards, and practices for design, construction, and alteration of public water and sewer systems.	COMPLETED	N/A – ONGOING	EMPG, HMGP, PDMP, State Funding (General Fund and State Revolving Funds for public water and sewer infrastructure improvements)	Could possibly be a planning/research project under the HMGP or PDMP? Could also possibly be done in house as a work project under the EMPG? 2011 status: Bullets 1, 2 and 3 are part of ongoing system monitoring and regulation efforts by the MDEQ to ensure the structural and operational integrity of water and sewer systems against natural, technological and human-caused hazards. This is an ongoing, established process that has been strengthened in emphasis since Michigan's infrastructure "freeze disaster" (Federal Disaster 1028-DR-MI in 1994) and is adequate to meet the State's needs in this area. For these reasons, this objective is being removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Subject matter experts would need to obtain and study the current standards and practices to arrive at this determination. Even if this may seem at present to be a heavy staff burden for the most involved agencies, such a burden might be lessened by spreading the task out, at first, over a longer time and across many staff, and then later, after a certain amount of information has been collected, a more focused examination might be able to complete the task efficiently, without an excessive work burden at any particular time. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item relates directly to technological hazards involving infrastructure failure (even if the ultimate cause of that failure stems from weather hazards), and this infrastructure is also relevant for the human-related hazard of public health emergencies.
Objective 2.17: Determine the feasibility of increasing the authority of the MDLEG Manufactured Housing and Land Development Division to allow for amendment or rejection of proposed manufactured housing subdivision plats that are located in, adjacent to, or would be adversely impacted by, technological hazard areas.	• Study the feasibility (and desirability) of increasing the MDLEG authority to amend or reject manufactured housing subdivision plats that are at risk (potential/actual) from technological hazard areas. • If feasible and desirable, develop a statewide standard and universal application of regulations in the development of manufactured housing subdivisions.	REMOVED	N/A	State Funding (General Fund)	At present, proposed manufactured housing subdivision plats are reviewed by the MDEQ for floodplain control, but no other agency reviews such proposals for other hazards, including technological hazards. Generally, subdivision development is a local zoning issue in Michigan. Local units of government have been reluctant to yield that authority to the State. A statewide standard and universal application of regulations in the development of manufactured housing subdivisions would be desirable, but may be heavily opposed by mobile home park developers and the Michigan Townships Association. However, the issue warrants further study. (Ongoing) 2011 status: This objective is not feasible given political and fiscal realities and current and projected future resource environments. It will be tabled for the foreseeable future. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: This objective is fairly modest in scope and therefore, in itself, should not entail a great deal of expense, compared with the scale of the issue it might eventually address. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is specifically aimed at technological hazards.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 2.18: Promote wind resistant construction techniques to builders and the public, to prevent / minimize major structural damage due to severe winds.	• Conduct a public information campaign aimed at increasing the use of structural fasteners in new construction and retrofitting of existing structures. The campaign could be part of an existing hazard awareness campaign (i.e., Severe Weather Awareness Week) or a separate effort. • Develop a slogan that promotes the use of structural fasteners in residential and commercial construction. • If the Michigan "Safety House" demonstration model project is implemented, wind resistant construction techniques will be highlighted in that demonstration model. (Refer to Objective 2.2 for details.)	COMPLETED	N/A – ONGOING	EMPG, HMGP, PDMP, State Funding (General Fund)	Possible slogan names: "Let's Keep it Together"; "Tie One On"; "Brace Yourself"; "Get a Grip"; "Don't Fall Apart"; "Remember the Lesson of the Three Little Pigs"; "Make the Connection"; "Let's Stay Connected"; "Strap it On to Keep it Together"; etc. 2011 status: This objective has effectively been met by regional and/or national advocacy and education campaigns conducted by fastener manufacturers, building supply retailers, nongovernmental organizations, and various governmental agencies – including FEMA. In fact, the FEMA web site contains excellent information on and provides links to other sites with information on wind resistant construction techniques through the use of structural fasteners and other means. Although a Michigan-specific campaign has not been established, these other efforts provide sufficient advocacy and guidance for builders and citizens wishing to increase structural integrity through the increased and consistent use of structural fasteners. Bullet 3 is not feasible because the objective related to development of the Michigan "Safety House" has been tabled from further consideration due to non-feasibility. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: This objective can be served by the distribution (or web-posting) of information, or by attendance\presentations at meetings and appropriate conferences, or by the submission of materials to newsletters, electronic networks, or targeted publications. All these options entail only low-to-moderate costs, and the selected approaches can be readily adjusted over time to suit the current staffing and budget situations of the implementing agency. Thus, the benefits of this effort are very likely to outweigh the costs involved. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses upon the severe wind hazard, but the protected structures can include critical facilities that relate to technological hazards such as infrastructure failure.
Objective 2.19: Develop a methodology for identifying and alerting communities of periods of extended or severe cold temperatures that could lead to widespread water and sewer system freeze-ups.	• Research the combinations of temperature, snow cover, soil conditions, pipe depth, water temperature (etc.) required to create water and sewer infrastructure freeze conditions. • Determine the number of days per year that infrastructure freeze conditions could be expected for each region of the state. • Establish a standardized warning classification system for the level of risk expected (i.e., freeze watch, freeze warning), similar to those used for severe weather. • Develop a warning notification system that can be utilized in all Michigan communities.	COMPLETED / REMOVED	N/A – ONGOING	HMGP, PDMP, EMPG, State Funding (General Fund)	Research efforts should involve the National Weather Service, Army Corps of Engineers Cold Regions Research and Engineering Laboratory, MDEQ, and the Winter Cities Association. Could possibly be a planning / research project under the HMGP or PDMP? Could also possibly be done in house as a work project under the EMPG? 2011 status: This objective is effectively met by ongoing system monitoring and regulation activities by the MDEQ to ensure the structural and operational integrity of water and sewer systems against natural, technological and human-caused hazards. This process has been strengthened in emphasis since Michigan's infrastructure "freeze disaster" (Federal Disaster 1028-DR-MI in 1994) and is adequate to meet the State's current needs in this area. Although a Michigan-specific classification system has not been developed, ongoing and ever-improving freeze forecasts by the National Weather Service provide sufficient early notification to community officials of the potential for infrastructure freeze-ups due to cold temperatures and/or ground frost depth. The feasibility of establishing, maintaining and consistently implementing a Michigan-specific early warning system is diminished by an ever-decreasing resource environment, and future resource allocations – if they are received – would likely be applied to other higher priority activities. For these reasons, this objective is being removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: The amount of work involved in setting up an additional protocol for weather-related notification shouldn't be very great, compared with the enormous costs that have been caused by freezing damage. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is most relevant for natural weather hazards, but also addresses the secondary impacts involving technological hazards such as infrastructure failures.
Objective 2.23: Mandate that schools, hospitals, fire stations, and other critical public facilities (paid for fully or partially by state funds) not be constructed in known hazard areas unless sufficient mitigation measures are implemented to reduce potential injuries, loss of life, property damage, and loss of function or essential services.	• Define what constitutes a "hazard area" and "sufficient mitigation measures" to ensure clarity and comprehensiveness in the application of the mitigation strategy. • Define what a "critical public facility" is and develop a statewide standard and universal application of regulations in the construction and siting of such facilities. • Ensure that provisions are put in place to eliminate any possibility of violations to the "Headlee Amendment" of the Michigan Constitution. • Study the feasibility of enacting legislation to ensure that this impact reduction measure is institutionalized in all program areas and for all types of applicable facilities. • Seek legislation (if feasible). • Develop new administrative rules as required.	REMOVED	N/A	State Funding (General Fund)	At present, there are no requirements for the location of emergency facilities, other than standard local zoning laws – many of which prevent building in floodplains. Local zoning laws rarely consider construction restrictions for other hazards. The Michigan Planning Enabling Act (2008 PA 33), passed after years of debate and deliberation by planning officials, elected officials and a number of other professional discipline stakeholders, does not contain this provision and a re-write of this law is highly unlikely given current and projected future political and fiscal realities. This issue is further complicated by the fact that there is no clear, universally accepted definition of what constitutes a "critical facility." Various federal emergency planning guidance documents provide brief definitions of critical facilities; however, there are widely varying opinions on these definitions. Critical facilities are also not clearly defined in Michigan law. 2011 status: Although this objective certainly has merit, its chance for implementation in the current and projected future political and social agenda is extremely low. Because there are other, higher priority mitigation needs and an ever-dwindling resource environment, it is unlikely that resources will be devoted to this objective in the foreseeable future. Therefore, it will be removed from further consideration and placed in the "Compendium of Addressed Objectives" table due to non-feasibility. BC REVIEW: This objective was intended to be able to have a preventive effect without entailing significant costs for its implementation, being primarily rooted in examining the procedures followed in capital facilities planning (primarily done at the local level), so that consideration must be given to the existence and location of identified floodplain areas or other known areas of higher-risk. The completion in recent years of dozens of hazard mitigation plans that cover the vast majority of Michigan's land area, from a local perspective, is a new resource that would allow this objective to be truly multi-hazard in scope, but at a minimum there could easily be a requirement that local Flood Insurance Rate Maps be consulted, which clearly identify areas of greater flood risk. The costs of looking at these available data sources are not great at all. This objective would lead to the consideration of more expensive activities that design or engineer such facilities into being hazard-resistant, but those costs would be seen as justifiable on a case-by-case basis, in view of the hazard vulnerabilities identified through this type of mandate. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item refers to hazard areas, which are definable in terms of all types of hazards—natural, technological, and human-related.
Objective 2.24: Require colleges / universities to adhere to the provisions of the State Construction Code and third party inspections.	• Establish a dialogue with the MDLEG on the feasibility of including these structures in the Code provisions. • If feasible, assist the MDLEG in revising legislation and promulgating rules to include college facilities in the Code provisions.	COMPLETED	2002 / ONGOING	State Funding (General Fund)	2011 status: The enactment of the Construction of School Buildings Act (2002 PA 628) and the Stille-DeRossett-Hale Single State Construction Code Act (1999 PA 245) effectively addresses this objective. In addition, college and university facilities used for instructional purposes are also required to comply with the fire safety Administrative Rules promulgated by the State Fire Safety Board under the Michigan Fire Prevention Act, 1941 PA 207, as amended. Collectively, these regulatory mechanisms address the construction and occupant safety concerns at college / university facilities, as identified in this objective. Therefore, it will be removed from further consideration and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Colleges and universities typically have the capacity to realize this objective without undue hardship. The density of residential arrangements (and other functions) on academic campuses requires things to run smoothly, and also means that an emphasis on code compliance and inspections is not an unreasonable or inappropriate requirement. The costs of the types of accidents or injury that might result from non-compliance could easily be estimated to exceed the costs of non-compliance. Whether considered in terms of their housing, sporting/recreational, or employment/research functions, colleges and universities clearly have a lot at stake in maintaining efficient and safe operational arrangements for these activities, and each institution's reputation is also quite important to maintain. Therefore, there is already great cause for each institution to voluntarily wish to comply with or exceed code and inspection standards. Given what is at stake, benefit-cost considerations favor such compliance, and the promotion of such compliance to a mandated level should not be seen as imposing too much of an additional burden. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is relevant not only to the ability to withstand natural hazards, but also to prevent technological hazards. Connections may even be inferred between this item and the avoidance of human-related hazards such as public health emergencies.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 3.1: Integrate existing hazard awareness campaigns into one safety promotion campaign that addresses hazard vulnerability reduction, crime prevention, fire safety, traffic safety, school safety, etc.	• Study the feasibility of establishing a "Michigan Safety First Community" designation that local communities could work toward by undertaking appropriate public safety and hazard mitigation measures.	REMOVED	N/A	EMPG, HMGP, PDMP, State Funding (General Fund), Private Funding (Partners TBD)	The "Michigan Safety First Community" designation could possibly have a graduated incentives program (i.e., tax breaks, insurance rate reductions, less regulatory burden, etc.) as communities implement required actions in support of the designation. A detailed concept paper on the "Michigan Safety First Community" designation was developed by the MSP/EMHSD during FY 01. That paper contains implementation options for this initiative. 2011 status: The "Michigan Safety First Community" initiative (Objective 2.2) was tabled from further consideration due to non-feasibility; therefore, this tie-barred objective will also be tabled from further consideration. Given current and projected future resource environments, it is unlikely that either objective will be implemented in the manner described. Refer to the "Compendium of Addressed Objectives" table. BC REVIEW: Although it may take considerable time and coordination efforts to identify and organize the integration or coordination of these efforts, such coordination would be likely to result in certain efficiencies that would not otherwise have been realizable. More importantly, if such coordination also increases the level of awareness and effectiveness of even some of these safety campaigns, the resulting prevention of deaths, injuries, and property/service losses would reasonably be expected to justify these safety-promotion efforts. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item refers to a full array of natural, technological, and human-related hazards.
Objective 3.4: Coordinate proposed recreation land purchases with identified flood mitigation needs across the state.	• Hold regular coordination meetings with the MDNR Parks and Recreation Division to review each agency's short and long term needs and proposed land purchases. • When possible, purchase land that has both recreation and flood mitigation value. • Develop strategies to integrate this objective into local planning efforts (e.g., hazard mitigation, comprehensive / land use, parks / recreation, etc.) to ensure it is considered in both long and short term land use / development decisions.	REMOVED	N/A	HMGP, EMPG, FMAP, PDMP, RFCP, SRLP Parks & Recreation Funding (federal, state, local)	Areas under consideration for purchase as open space or parks and recreation land may also serve the dual benefit of mitigating flood hazards by prohibiting residential or commercial development or providing space for storm water or seasonal runoff retention / detention. Conversely, areas under consideration for purchase for flood mitigation purposes may also have significant open space or recreation value. (Ongoing) 2011 status: Because of differing funding cycle time frames and purchase objectives, it is difficult to coordinate purchase activities with the MDEQ. In addition, virtually all land acquisition projects undertaken for flood mitigation purposes are done through local government-sponsored project applications. Many of Michigan's mitigation grant program funded flood acquisition and relocation projects have in fact purchased land that was then converted to permanent recreational open space. This purchase strategy is well-founded in local hazard mitigation plans and is strongly advocated by the MSP/EMHSD in its guidance and technical assistance provided to local mitigation plan developers and potential grant applicants. Current MSP/EMHSD and MDEQ staffing resources are inadequate to allow much time to be devoted to the proactive identification, statewide, of potential land purchases for flood mitigation purposes. In addition, the State of Michigan generally lacks matching funds to proactively purchase land itself for flood mitigation purposes – although the MDEQ occasionally purchases land for recreational purposes using dedicated (restricted) funding sources and in many cases the land purchased contains floodplain property. This objective is more appropriate for implementation at the local government level. The MSP/EMHSD consistently encourages the acquisition of flood prone property as a highly desirable and high priority hazard mitigation measure. Because this objective is better suited for local implementation, it will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: From the State government perspective, this action may end up entailing few additional costs, as procedures are developed and routinized, to make use of available flood information when engaged in recreational planning and related resource development and land acquisition/management decisions. From the local perspective, the costs of this activity (mainly in terms of time and staff efforts) can probably to a large extent be incorporated into the larger goal of integrating hazard mitigation practices into urban and regional planning activities. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item is focused on the flood hazard, but may help to prevent secondary impacts involving public health and infrastructure failure.
Objective 3.5: Study the feasibility of requiring Michigan State Housing Development Authority (MSHDA)-financed structures to incorporate wind engineering techniques designed to reduce or eliminate future wind damage.	• Conduct a joint study (MSP/EMHSD and MSHDA) to determine if enhanced wind engineering measures would be feasible in MSHDA projects. The study should address both practical and financial considerations. • If the study results are affirmative, revise MSHDA documents and procedures as necessary to address the enhanced construction requirements.	COMPELTED	N/A – ONGOING	State Funding (General Fund)	It is good public policy to require government financed or government backed residential housing units to be built to a higher standard, making them more resistant to wind damage from tornadoes and severe winds. Government should lead by example. Generally, such measures are highly cost-effective and easy to implement if considered up front. 2011 status: A multi-county pilot wind engineering project was conducted with the MSHDA in 1999-2000 using $150,000 in U.S. Department of Housing and Urban Development (HUD) "Disaster Recovery Initiative" funding associated with the 1998 severe storms and flooding which struck the Midwest (and which resulted in Federal Disasters 1226-DR-MI and 1237-DR-MI in Michigan). Although this project was successful, the staff time required to coordinate, monitor and report activities was considerable and would be difficult to sustain on a regular basis. However, since that pilot project MSHDA has taken a more proactive role in promoting wind engineering in its projects. Wind engineering techniques are incorporated in MSHDA-financed structures when it is cost-acceptable to do so and/or when required by the State's Single Construction Code. The MSHDA has taken this proactive mitigation posture voluntarily. A formal mandate, requiring MSHDA to incorporate enhanced wind engineering techniques in all of its projects, is unlikely unless it comes directly from its counterpart federal funding agency, HUD. A state-level mandate is unlikely because it has the potential to increase costs for MSHDA building and rehabilitation projects (although only by a small amount) and the current political and fiscal environments are generally not amenable to increased, mandated regulations. Since the MSHDA voluntarily considers enhanced wind engineering in its structures, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Initial costs of exploratory discussions would not be very large. A starting point might involve initial contact or meetings with MSHDA representatives, through which some of the information about wind engineering techniques would be relayed by hazard mitigation staff to selected MSHDA staff who would be able to evaluate the feasibility of incorporating such practices into MSHDA-financed structures. A focus might initially be placed upon particular areas of the state which have historically proven to be more vulnerable to high winds and tornado events, and the cost-effectiveness of wind engineering requirements might be tested in the highest-risk geographic areas of the state, as a basis for evaluating whether any farther-reaching policy change would be justifiable. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item addresses weather hazards, but may also help to prevent secondary effects that may result from wind damages to residences.
Objective 4.5: Study the feasibility of developing a State Hazard Mitigation Fund to provide seed money to local communities and state agencies wishing to undertake mitigation initiatives.	• Study the feasibility of establishing a permanent fund for mitigation purposes. • Establish fund mechanisms and parameters in conjunction with the Michigan Department of Technology, Management and Budget (MDTMB). • Per Objective 4.6, develop protocols for soliciting and accepting donations from the private sector (businesses, philanthropic organizations, individuals, etc.). • As appropriate, seek funding from the Michigan Legislature. • Identify and seek funding from potential private sector donors.	REMOVED	N/A	State Funding (General Fund), Private Funding (Partners TBD)	2011 status: No additional progress has been made on this objective due to lack of staff and competing work priorities. Due to current and projected future political and fiscal environments, the likelihood of this objective being achieved is almost non-existent. The State's prolonged and severe economic crisis has effectively eliminated any possibility of a state-funded initiative of this nature, now or in the foreseeable future. For this reason, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: The feasibility of such a fund might be assessable under existing staffing and administrative arrangements within state government, given sufficient time, awareness, and cooperation among those who would need to be involved. The ultimate usefulness of such a hazard mitigation funding source would easily be expected to justify the efforts involved in bringing it about. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2008 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 4.7: Develop a construction and maintenance manual for road and drainage construction and maintenance personnel (to minimize future flood damages).	• Review the hazard mitigation strategy document developed for 1128-DR-MI to determine the core issues identified by the interagency mitigation team. • Establish a subcommittee of subject matter experts to develop the manual. • Develop and distribute the manual. • Conduct training workshops on using the manual (targeting drain commissioners, road maintenance personnel, contractors, and farmers). • Consider integrating the manual into the CD produced under Objective 1.1 (statewide mitigation marketing and education campaign) since drain commissioners and road maintenance personnel are included in the target groups for that project.	COMPLETED	2010	HMGP, FMAP, PDMP, EMPG, State Funding (General Fund)	Recommended elements include (1) Construction standards and details for sizing, design of facilities, materials, installation methods for culverts, drainage ditches, and bridges, and (2) Maintenance techniques and scheduling methods (planning, funding, personnel issues, cost management, etc.). 2011 status: The excellent guidance documents produced by the MDEQ related to floodplain management ("Floodplain Management for Local Officials" and "Floodplain Management in Michigan: Quick Guide", as well as the "Flood Hazard Mitigation Handbook"), coupled with construction guidance documents developed by the MDOT for its staff, effectively meet the intent of this objective. Regarding Bullet 5, these documents will be referenced as guidance for public works personnel on the mitigation marketing and education campaign CD being developed under Objective 1.1. For this reason, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: A manual would primarily involve considerable personnel time for its development, but such costs can be accommodated, over time, within the normal staffing levels of state agencies. Distribution and publications costs can also be reduced through the use of modern electronic media such as the web-posting of the information. Compared to the enormous scale of Michigan's road and drain infrastructure (as well as the large number of local offices that handle these matters), the benefits of producing and distributing such information would pretty clearly outweigh the costs involved in its development. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on the flood hazard, but is also relevant for selected additional hazards, such as infrastructure failures and transportation accidents, which are considered to be technological hazards.
Objective 4.8: Re-establish the low interest loan programs used in the mid-1980s to elevate and set back flood and erosion prone structures along the Great Lakes shoreline. Study the feasibility of establishing a similar program for riverine flood prone structures for elevation, flood proofing, or acquisition and relocation.	• Conduct a feasibility study of both options. • If feasible, present the concept to the Governor's staff for approval. • Seek a legislative sponsor for legislation to establish the program. • Provide follow up as needed through the legislative process.	REMOVED	N/A	State Funding (General Fund)	In the mid-1980s, zero interest loans made to erosion and flood-impacted homeowners as well as to flood-impacted agricultural producers. Under this program, the State took its invested funds out of investment and delivered those funds to local banks. The banks then loaned those funds at no interest to owners of flood- or erosion-impacted structures and flood-impacted agricultural producers. When the loan principal was paid back, without interest, the bank returned the money to the State. In this case, the interest the State normally would have earned on these funds, had they been invested, was lost. Due to the severe drought in Michigan during the summer of 2001, the agricultural community asked for a reinstatement of the zero interest loan program – a measure passed into law on February 27, 2002. However, legislators without a doubt would be reluctant to fund another zero interest loan program at the same time, especially when they recall that the true impetus of the mid-1980s program was double digit inflation, 20-percent unemployment rates, and 18-percent interest rates. The mid-1980s economic conditions were the driving force behind the program, and the flood disasters that occurred in 1985 and 1986 were merely the catalyzing agents that brought focus to the issue. 2011 status: No additional progress has been made on this objective due to lack of staff and competing work priorities. Due to current and projected future political and fiscal environments, the likelihood of this objective being achieved is almost non-existent. The State's prolonged and severe economic crisis has effectively eliminated any possibility of a state-funded initiative of this nature, now or in the foreseeable future. For this reason, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: The study of the feasibility of expanding this type of program to cover other circumstances would seem to be warranted in view of the numerous high-risk areas in which structures are also known to be at-risk from flooding and erosion. The loans themselves would involve individualized assessments of cost-effectiveness. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses on the shoreline erosion/flood hazard, although the function of some of the structures and infrastructure located within at-risk shoreline areas may allow this effort to also mitigation technological hazard impacts.
Objective 4.11: Study the feasibility of developing a state tax incentive program to encourage home and business owners to undertake mitigation measures that are consistent with local hazard mitigation plans.	• Research Michigan's solar energy tax credit program, as well as programs in place in other states, to determine the revenue and programmatic implications of implementing such a program. • If feasible, present the concept to the Governor's staff for approval. • Seek a legislative sponsor for legislation to establish the program. • Provide follow up as needed through the legislative process.	REMOVED	N/A	State Funding (General Fund)	Could be modeled after the state solar energy tax credit program instituted in the 1980s. Tax incentives send the strongest possible signal to the citizens of the state that hazard vulnerability reduction is important. The program could be used for both natural and technological hazard mitigation. 2011 status: Although this idea is certainly meritorious, given the current and projected future political and fiscal environments, it stands almost no chance of being implemented. The State's prolonged and severe economic crisis has effectively eliminated any possibility of a state-funded (i.e., via loss of tax revenue) initiative of this nature, now or in the foreseeable future. For this reason, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: Since hazard vulnerabilities end up costing the government a great deal of money in response and recovery costs, investments in hazard mitigation has been found to reduce such costs, in areas where projects are implemented. A tax-incentive program has the potential to be much more far-reaching, widespread, and efficient than traditional grant-based funding mechanisms, which are limited to specific selected projects that entail a great deal of labor-intensive preparation and administrative oversight. The amount of benefit, per cost expenditure, from a tax-incentive based mitigation subsidy could be enormous. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: The general concept of hazard mitigation should be interpreted as including the consideration and alleviation of a full range of natural, technological, and human-related hazards.
Objective 4.13: Develop a Michigan-specific flood proofing handbook and make it available to home and business owners in flood prone areas.	• Establish a subcommittee of subject matter experts to develop the handbook. • Develop and distribute the handbook. • Conduct training workshops on using the handbook (targeting home and business owners).	COMPLETED	2010	HMGP, EMPG, FMAP, PDMP, CAP, State Funding (General Fund)	2011 status: The MDEQ publishes three excellent flood mitigation handbooks for local government officials, and these documents also have applicability to home and business owners. The titles of those documents are "Flood Hazard Mitigation Handbook," "Floodplain Management for Local Officials," and "Floodplain Management in Michigan: Quick Guide." These state-specific guidance documents, coupled with the excellent flood proofing guidance documents published by FEMA and available on the FEMA and Ready.Gov web sites, effectively address this objective. This objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. BC REVIEW: This objective required staff time and some other associated costs but was completed using existing governmental resources. The documents have been web posted by the MDEQ and are available online for statewide distribution. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses upon flood mitigation, but if flood proofed facilities include certain types of critical infrastructure, then such improvements may be considered relevant to the mitigation of technological and human-related hazards as well.
Objective 4.14: Study the feasibility of establishing a state-level insurance or low interest loan program to help repair, relocate, or fund mitigation measures for homes and businesses in subsidence prone areas or damaged by a subsidence incident.	• Study the state-level programs already in place in Illinois, Kentucky, Ohio, Pennsylvania and West Virginia to determine commonalties and parallels with Michigan's subsidence situation. • In conjunction with the MDEQ Geological and Land Management Division, prepare a position paper that outlines the scope and magnitude of the problem, probable costs associated with such a program, and alternatives that could be pursued to establish and implement such a program. • If feasible, present the findings to the Governor's staff for approval. • Seek a legislative sponsor for legislation to establish the program. • Provide for follow up as needed through the legislative process.	REMOVED	N/A	State Funding (General Fund)	2011 status: Although this idea is certainly meritorious, given the current and projected future political and fiscal environments, it stands almost no chance of being implemented. The State's prolonged and severe economic crisis has effectively eliminated any possibility of a state-funded initiative of this nature, now or in the foreseeable future. For this reason, this objective will be removed from further consideration in this plan and placed in the "Compendium of Addressed Objectives" table. (Note: Also see update comments for Objectives 4.5, 4.8 and 4.11.) BC REVIEW: The main costs of such a feasibility study would involve the time and resources used by personnel who have sufficient expertise—to design a research approach and then accumulate and evaluate appropriate information. Since there are few programs that are directly aimed at the mitigation of private risks from ground subsidence in Michigan, it is estimated that the administrative costs involved in a feasibility study may be offset by the benefits eventually derived from such a study, such as the identification of highest-risk areas in which more specific projects can be identified and implemented. If the proposed insurance or loan programs do not appear to be feasible, than the study would have prevented the application of funds to a lesser-addressed need, allowing available funds to be either applied or shifted to higher-priority concerns, in accordance with the findings of the study. ENVIR SOUND: Y, TECH FEASIBLE: Y, MULTI-HAZARD: This item focuses upon the subsidence hazard, but certain businesses and structures may include critical facilities whose safety and maintenance helps to alleviate technological and human-related hazards, as well.

Compendium of Addressed Objectives

(The following objectives have either been completed or removed from further consideration due to non-feasibility, consolidation, or other reason.)

Objective (in 2011 MHMP)	Implementation Method	Completed or Removed?	Date Addressed	Funding Source	Comments / Rationale
Objective 4.6: Evaluate flood damage to and caused by failure of sewage handling systems.	• Convene a subcommittee of subject matter experts from applicable agencies to review this issue in recent flood events and develop solutions to identified problems. • Implement the solutions where feasible.	REMOVED: Merged into Objective 2.7	2013	EMPG, CAP, State Funding (General Fund)	The 409 Plan for Federal Disaster 774, October 1986, recommended creating a multi-disciplinary task force to evaluate this issue. This issue has surfaced in more recent flood disasters as well. 2011 status: Little progress has been made on this objective due to lack of staff and competing work priorities. This objective is still valid and will remain active for future implementation. 2014 status: Little progress has been made on this objective due to lack of staff and competing work priorities. This objective is still valid and will remain active for future implementation, but has been into Objective 2.7, where it should be made a part of ongoing flood mitigation activities.

MITIGATION OPPORTUNITIES, RECOMMENDATIONS, AND IMPLEMENTATION

Summary of Target Completion Dates for Plan Objectives

Year	Objectives to Be Completed	General Priority Ranking
2015	**1.2: Encourage and promote multi-hazard emergency plans in all public and private institutions.** **2.6: Encourage Community Wildfire Protection Plans and establish and sustain additional FIREWISE communities, statewide.** **3.1: Promote urban forestry and vegetation management programs and initiatives to develop more resilient woodlands, streetscapes, and landscapes in communities throughout Michigan.** **3.2: Promote floodplain management activities throughout Michigan, increase statewide participation in the National Flood Insurance Program, and ensure that the NFIP policy base accurately reflects the flood hazard threat in Michigan.** **4.2: Promote better information flow on hazard mitigation among agencies, between levels of government, and between public and private entities.** **4.8: Highlight cost savings and other benefits to taxpayers due to mitigation measures that helped reduce future disaster damages.**	**HIGH**
2016	**1.1: Increase public / private sector awareness of hazard related dangers and mitigation solutions.** **1.6: Develop comprehensive hazard analyses / risk assessments (as part of a hazard mitigation plan development process) in all local emergency management program jurisdictions to address all pertinent natural, technological and human-related hazards.** **2.1: Increase knowledge of urban / regional planners and emergency managers about sound land use / development practices that can help reduce long term hazard risk and vulnerability.** **2.4: Acquire and relocate residential and commercial structures currently occupying floodways of Michigan rivers and streams.** **2.5: Acquire / relocate or elevate the worst repetitive loss structures in Michigan.** **2.7: Promote and assist with flood mitigation projects in all vulnerable areas, statewide.** **2.8: Promote and assist with wildfire mitigation projects statewide.** **2.9: Identify and fund appropriate mitigation measures for vulnerable public and private facilities and infrastructure.** **2.10: Promote and assist with severe wind mitigation projects statewide.** **2.11: Promote and assist with winter weather mitigation projects statewide.** **4.1: Educate and inform local and state officials, political leaders, the public, and involved professional disciplines about hazard mitigation concepts, programs, processes, and considerations.** **4.3: Continuously revise and enhance the Michigan Hazard Mitigation Plan (MHMP) to ensure it remains current, accurate, relevant, implementable, and in compliance with the federal Disaster Mitigation Act of 2000. (Update due in March 2017, but the hazard analysis is to be updated by 2015 or 2016.)** **4.7: Identify and formally recognize local, tribal, regional, state, or private projects and initiatives that have successfully incorporated hazard mitigation concepts and/or exemplify sound hazard vulnerability reduction strategies.**	**HIGH**
2017	**1.5: Support and utilize a system of real-time rainfall and river flow gauges throughout Michigan as part of an overall flood warning system.** **4.3: Continuously revise and enhance the Michigan Hazard Mitigation Plan (MHMP) to ensure it remains current, accurate, relevant, implementable, and in compliance with the federal Disaster Mitigation Act of 2000. (Update due in March 2014)** **4.4: Continuously monitor proposed legislation in Michigan for possible hazard mitigation opportunities and/or implications.**	**MEDIUM**

MITIGATION OPPORTUNITIES, RECOMMENDATIONS, AND IMPLEMENTATION

Summary of Target Completion Dates for Plan Objectives

Year	Objectives to Be Completed	General Priority Ranking
2018	**1.3: Promote local early warning systems and capability.**	**MEDIUM**
2019	**1.4: Promote the concept of "safe rooms" within homes, businesses, and local / state governmental facilities to prevent / minimize injury and loss of life in tornadoes and severe winds.** **2.2: Further define identified flood vulnerabilities in state owned / operated critical facilities.** **4.5: Develop protocols for soliciting private sector donations for hazard mitigation purposes.**	**MEDIUM**
2020		**LOW**
2021		**LOW**
2022	**2.3: Identify critical floodplain storage areas within the state and enter the data into appropriate Geographic Information Systems to enhance future land use planning and development decision making.**	**LOW**
2023		**LOW**
2024		**LOW**

This page intentionally left blank.