VIII. Inventory of Hazard Mitigation Actions

The following mitigation actions, coupled with the goals and objectives highlighted in the previous chapter, reiterate the necessity of intergovernmental cooperation among all local jurisdictions. In order for these actions to be successfully implemented, the county and all the entities within the county must employ a teamwork approach to hazard planning. There must be local “buy–in” to this hazard mitigation plan by St. Clair County municipalities and residents to reduce the loss of life and protect critical infrastructures in the event a hazard should occur. The most effective way this “buy–in” can be achieved is by incorporating the goals, objectives, and actions put forth in this plan into other existing and future community plans, regulations, programs and projects.

The following list of possible hazard mitigation actions for St. Clair County does not preclude other ideas for activities to save lives and prevent or reduce damages in the future. Many of the ideas are developed in various FEMA publications, including www.fema.gov, as well as in publications of other federal, state, and local agencies.

Planning for Hazards
Hazard mitigation planning is most successful when approached from a multi–hazard perspective. Some mitigation ideas fit easily into many or all hazard types. A selected mitigation action for one hazard may reduce the level of risk in other hazards as well. At the same time, a mitigation action that reduces the level of risk for one hazard may increase the risk of damage from another hazard.

Terrorism/Sabotage
Mitigation Actions: Actions to mitigate acts of terrorism and/or sabotage include:

- Using laminated glass and other hazard–resistant, durable construction techniques in public buildings and critical facilities
- Establishing avenues of reporting information preventing terrorist incidents and sabotage
- Consistent use of computer data back–up systems and anti–virus software.
- Computers–anti–virus, backup systems
- Monitoring and reporting–Alertness, Awareness, and Monitoring of organizations
- Emergency responder preparedness–training, and planning
- Public Gatherings–heightening security at public gatherings, special events, and critical community facilities and industries
- Mental Health Services–greater awareness of, and provision for, mental health
- Private Emergency Plans–private sector development and testing of internal emergency plans and procedures, including Continuity of Operations (COOP) planning.

Infrastructure/Utility Failure
Infrastructure damaged by a disaster may not necessarily be replaced in the way it was originally constructed, but rather with hazard mitigation and community resiliency in mind.

Mitigation Actions: Mitigation actions for Infrastructure and Utility Failures include:

- Incorporating hazard mitigation into capital improvement programs
- Flood protection measure for water or sewer facilities, road elevation, or drainage improvements
- Increasing hazard resistance when repairing or replacing aging transportation infrastructure such as roads, bridges, and tunnels.
- Bolstering the protection of hospitals, fire stations, emergency operations centers, and other critical facilities through structural retrofits
- Dam or levee maintenance
- Underground power lines
- Tree pruning/canopy management
- Utility system redundancies
- Lightning protection measures

Some of these mutual benefits include:

- Hazard mitigation plans may have already identified replacement values for structures or predicted where damages are likely to be greatest.
- Information in the hazard mitigation plan may assist public works officials with post-disaster damage assessments
- Public works officials may have first-hand knowledge of what damage has occurred in the community and what needs to be done to mitigate it; and
- An opportunity to look at activities that will help the community in the short term, while reducing risk in the long term.

If damaged community infrastructure is replaced in the same manner as it was originally constructed, without integrating hazard mitigation, it may remain vulnerable to future disasters.

**Mitigation Alternatives for Infrastructure Failures**

- Proper location, design, and maintenance of water and sewer systems (to include insulation of critical components to prevent damage from ground freeze)
- Burying electrical and phone lines, where beneficial and appropriate, to resist damage from severe winds, lightning, ice, and other hazards
- Redundancies in utility and communications systems, especially “lifeline” systems; to increase resilience (even if at the cost of some efficiency)
- Separation and/or expansion of sewer systems that will otherwise fail to completely due to overloading
- Use of generators for backup power at critical facilities
- “Rolling blackouts” in electrical systems that will otherwise fail completely due to overloading
- Replacement or renovation of aging structures and equipment (to be made as hazard-resistant as economically possible)
- Physical protection of electrical and communications systems from lightning strikes
- Tree-trimming programs to protect utility wires from falling branches. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-ways)

Increasing public awareness and widespread use of the “MISS DIG” utility damage prevention service

**Mitigation Alternatives for Utility Failures**

- Redundancies and alternatives in the energy supply system; provision of backup supply systems
- The capacity to use more than one type of fuel to sustain necessary operations and functions
- Use of alternative sources of energy (e.g. solar, wind sources) for key functions
- Architectural designs that reduce the need for outside energy inputs
**Hazardous Materials Transportation Incident**

**Mitigation Actions:** Mitigation actions for hazardous materials transportation incidents include:

- Improved design, routing, and traffic control at problem roadway areas
- Long-term planning that provides more connector roads for reduced congestion of arterial roads
- Railroad inspections, maintenance and improved designs at problem railway/roadway intersections (at grade crossings, rural sign/signals for RR crossing)
- Proper planning, design, maintenance of, and enhancements to designated truck routes
- Public warning systems and networks
- Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents)
- Use of ITS (intelligent transportation systems) technology
- Locating schools, nursing homes, and other special facilities away from major hazardous material transportation routes

**Hazardous Material Facility Incident**

**Mitigation Actions:** Mitigation actions for fixed site hazardous materials incident include:

- Compliance with/enforcement of Resource Conservation and Recovery Act (RCRA) standards
- Eliminations of clandestine methamphetamine laboratories through law enforcement and public education
- Identification of radioactive soils and high–radon areas
- Proper separation and buffering between industrial areas and other land uses
- Location of industrial areas away from schools, nursing homes, etc.
- Public warning systems and networks for hazardous material releases
- Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents)
- Compliance with all industrial, fire, and safety regulations
- Insurance coverage
- Enhanced security and anti–terrorist/sabotage/civil disturbances measures
- Vital Infrastructure Team Assessments of SARA Title III facilities

**Radiological Accident**

Environmental impacts of incidents involving radioactive materials are generally similar to impacts caused by hazardous materials.

**Mitigation Actions:** Mitigation actions for radiological accidents include:

- Promoting flexibility in management of emergencies, for efficient use of resources
- Maintenance of full-time capability for immediate response
- Ensuring that responders, plans, facilities, and any necessary inter-organizational coordination are sufficient to provide the desired protection

**Public Health Emergency**

**Mitigation Actions:** Strategies to mitigate public health emergencies include:

- Immunization programs to vaccinate against communicable diseases
- Improving ventilation techniques in areas, facilities, or vehicles that are prone to crowding, or that may involve exposure to contagion or noxious atmospheres
- Radon detection and abatement activities, to reduce concentrations of radon in homes and buildings
- Maintaining community water and sewer infrastructure at acceptable operating standards
• Providing back-up generators for water and wastewater treatment facilities to maintain acceptable operating levels during power failures
• Demolition and clearance of vacant condemned structures to prevent rodent infestations
• Free or reduced—expense community clinics and school health services
• Brownfield and urban blight clean—up activities
• Proper location, installation, cleaning, monitoring, and maintenance of septic tanks
• Separation of storm and sanitary sewer systems

**Mass Casualty**

Whereas other hazards have a track record within the county, mass casualty has had no significant record of occurrence. But that, by no means, indicates that such a tragedy could not happen. Such accidents not only affect people with significant numbers of deaths and injuries but they may also cause traffic issues, property damage, explosions, fires, etc.

**Mitigation Actions:** Actions to mitigate mass casualty incidents include:

• Maximize medical surge capability and capacity for individual healthcare organizations.
• Maximize community capacity and capability (situational awareness, mutual aid and other resource sharing arrangements, patient distribution and redistribution, and other support).
• Institute modified delivery of healthcare to maintain critical medical services.
• Enhance health care coalition development with local response partners by aligning local planning for a Mass Casualty Incident from an all-hazards perspective.
• Strengthening the operational response framework used by hospitals and local partners in a coordinated approach toward incident command structure, human and material resource management, and treatment space for patient surge.

**Tornado**

**Programs and Initiatives – MSP Emergency Management Hazard Mitigation Plan**

• National Weather Service Doppler Radar
• National Weather Service Watches/Warnings
• Public Warning Systems
• Severe Weather Awareness Week
• Manufactured Home Anchoring
• FEMA Safe Room Benefit – Cost Calculator
• Electrical Infrastructure Reliability
• Structural Bracing and Wind Engineering
• Urban Forestry and Tree Maintenance Programs

**Hazard Mitigation Alternatives for Tornadoes**

• Increased coverage and use of NOAA Weather Radio
• Public early warning systems and networks
• Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster resistant landscape in public rights–of–way).
• Buried/protected power and utility lines. (NOTE: Where appropriate. Burial may cause additional problems and costs in case of breakage, due to increased difficulty in locating and repairing the problem).
• Using appropriate wind engineering measures and construction techniques (e.g. structural bracing, straps and clips, anchor bolts, laminated or impact—resistant glass, reinforced entry and garage doors, window
shutters, waterproof adhesive sealing strips, and interlocking roof shingles) to strengthen public and private structures against severe wind damage.

- Proper anchoring of manufactured homes and exterior structures such as carports and porches.
- Securing loose materials, yard, and patio items indoors or where winds cannot blow them about.
- Construction of concrete safe rooms in homes and shelter areas in mobile home parks, fairgrounds, shopping malls, or other vulnerable public areas.

Other Mitigation Actions –

- Residential expansion of safe rooms
- Community expansion of safe rooms

Extreme Temperatures

Mitigation Actions: Actions to mitigate periods of extreme temperatures include:

- Educate citizens regarding the dangers of extreme heat and cold and the steps they can take to protect themselves when extreme temperatures occur.
- Organize outreach programs to vulnerable populations, including establishing and promoting accessible heating or cooling centers in the community.
- Requiring minimum temperatures in housing/landlord codes.
- Encouraging utility companies to offer special arrangements for paying heating bills, if not already required by state law.
- Creating a database to track those individuals at high risk of death, such as the elderly, homeless, etc.
- Educate home/building owners about freezing pipes.

Transportation Disruption/Accidents

Mitigation Actions: Mitigation actions for transportation disruptions/accidents include:

- Improved design, routing, and traffic control at problem roadway areas
- Railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing)
- Long – term planning that provides more connector roads for reduced congestion of arterial roads
- Use of designated truck routes
- Use of ITS (intelligent transportation systems) technology
- Airport maintenance, security, and safety programs.

Flooding/Shoreline Erosion

Mitigation Actions: Mitigation actions for flooding/shoreline erosion include:

Programs and Initiatives

- Michigan Shoreline Flood and Erosion Hazard Regulatory Authority
- National Flood Insurance Program
- Community Education
- National Weather Service Watches/Warnings
- State – Administered Shoreline Hazard Mitigation Programs
- USACE Advance Measures Program
- Great Lakes Shoreline and Wetlands Task Force Report
- The Great Lakes Beach and Pier Safety Campaign
- Other State and Federally – Assisted Flood Mitigation Projects
- Coastal Management Program
Hazard Mitigation Alternatives for Shoreline Flooding and Erosion

- Floodplain/coastal zone management – planning acceptable uses for areas prone to flooding (comprehensive planning, zoning, open space requirements, subdivision regulations, land use and capital improvements planning).
- Dry flood proofing of structures within known flood areas (strengthening walls, sealing openings, use of waterproof compounds or plastic sheeting on walls).
- Wet flood proofing of structures (controlled flooding of structures to balance water forces and discourage structural collapse during floods).
- Elevation of flood-prone structures above the 100-year flood level.
- Construction of elevated or alternative roads that are unaffected by flooding, or making roads more flood resistant through better drainage and/or stabilization/armoring of vulnerable shoulders and embankments.
- Government acquisition, relocation, or condemnation of structures within floodplain or floodway areas.
- Employing techniques of erosion control in the area (bank stabilization, planting of vegetation on slopes, creation of terraces on hillsides).
- Enforcement of basic building code requirements related to flood mitigation.
- Joining the National Flood Insurance Program, obtaining insurance, and participating in the Community Rating System (CRS).
- Structural projects to channel water away from people and property (dikes, levees, floodwalls) or to increase drainage or absorption capacities (spillways, water detention and retention basins, relief drains, drain widening/dredging or rerouting, debris detention basins, logjam and debris removal, extra culverts, bridge modification, dike setbacks, flood gates and pumps, wetlands protection and restoration).
- Elevating mechanical and utility devices above expected flood levels.
- Flood warning systems.
- Monitoring of water levels with stream gauges and trained monitors.
- Anchoring of manufactured homes to a permanent foundation in flood areas, but preferably these structures would be permanently relocated outside of flood-prone areas and erosion areas.
- Control and securing of debris, yard items, or stored objects in floodplains that may be swept away, damaged, or pose a hazard when flooding occurs.
- Increased coverage and use of NOAA Weather Radio.

Transportation Structure Failure

Mitigation Actions: Mitigation actions for transportation structure failure include:

- Reduce the vulnerability of the transportation modes to intentional harm or disruption from natural events.
- Enforce safety and prevention programs.
- Develop/distribute and facilitate public awareness programs.
- Ensure Dangerous Goods practices/regulations are followed.
- Implement transportation route monitoring programs.
- Confirm that emergency response plans in place for all areas to allow for prompt response to transportation incidents.

Severe Winter Weather

Mitigation Actions: Michigan is susceptible to moderate snowfall and extreme cold, averaging 90 to 180 days per year of below freezing temperatures in the Lower Peninsula. All areas of St. Clair County are subject to
these conditions. Proper preparation can decrease the risks of injury that can occur during cold weather, snowstorms and ice storms in particular. Mitigation strategies include:

- Structures in winter storm hazard areas should be designed and built to withstand the projected snow (and ice) loads
- Residents and property owners should be informed of storm hazards and educated in safety and mitigation techniques.
- Critical facilities in areas of high storm hazard should be designed and managed to withstand likely storm impacts such as power outages, personnel shortages, and property damage
- Confirm that ice/snow storm emergency plans in place.
- Designate snow routes and strengthen critical road sections and bridges.

**Civil Unrest**

**Mitigation Actions:** Mitigation strategies for civil unrest include:

- Assess vulnerability and probability of communities within St. Clair County that may be subject to civil disturbances
- Advance awareness of a civil disturbance allows potentially affected locations time to implement reasonable measures to prepare
- Implement general emergency action plan measures
- Expand the emergency action plan to include a response to threats of civil disturbance
- Identify locations or conditions that could become a trigger to civil disturbance threats to the location
- Assign one or more persons the responsibility to monitoring the news releases and bulletins from the civil authorities, monitoring the Facebook, Twitter and other social media feeds for known groups such as “Occupy” and others that may be associated with organizing protests

**Structure Fire**

**Programs and Initiatives – MSP Emergency Management Hazard Mitigation Plan**

- Michigan Fire Prevention Act
- Michigan Department of licensing and Regulatory Affairs, Michigan Fire Fighters Training Council
- Michigan’s Office of Fire Safety
- National Fire Protection Association
- U.S. Fire Administration
- Local Fire Service
- The Hotel and Motel Fire Safety Act of 1990 (PL101 – 391)
- Fire Safety Rules for Michigan Dormitories
- U.S. Fire Corps
- Michigan Fire Service Coalition

**Hazard Mitigation Alternatives for Structural Fires**

- Code existence and enforcement
- Designs that include the use of firewalls and sprinkler systems (especially in tall buildings, dormitories, attached structures, and special facilities)
- Landlords and families can install and maintain smoke detectors and fire extinguishers. Install a smoke alarm on each level of homes (to be tested monthly, with the batteries changed twice each year). Family members and residents should know how to use a fire extinguisher.
- Proper installation and maintenance of heating systems (especially those requiring regular cleaning, those using hand – loaded fuels such as wood, or using concentrated fuels such as liquid propane).
- Safe use and maintenance/cleaning of fireplaces and chimneys (with the use of spark arresters and proper storage of flammable items). Residents should inspect chimneys at least twice a year and clean them at least once a year.
- Safe installation, maintenance, and use of electrical outlets and wiring.
- Measures to reduce urban blight and associated arson (possibly including Crime Prevention through Environmental Design).
- Defensible space around structures in fire-prone wild land areas.
- Proper maintenance of power lines, and efficient response to fallen power lines.
- Transportation planning that provides roads, overpasses, etc. to maximize access and improve emergency response times to all inhabited or developed areas of a community. (Not just planning for average traffic volumes in the community.)
- Discourage civil disturbances and criminal activities that could lead to arson.
- Enforced fireworks regulations.
- Elimination of clandestine methamphetamine laboratories through law enforcement and public education.
- Condominium-type associations for maintaining safety in attached housing/building units or multi-unit structures.
- Obtaining insurance.