

Chapter 5

Goal 2: Protect critical facilities, key assets, and public infrastructure.

Damage from hazards to property can be very costly. Therefore, property protection measures can be used to modify buildings or property subject to damage. The following three approaches are typical property protection measures:

- Modify the site to keep the hazard away,
- Retrofit the structure so it can withstand the impacts of the hazard, and
- Insure the property to provide financial relief after the damage occurs.

Property protection measures are normally taken by the property owner, although in many cases technical and financial assistance may be available through a government agency.

Objective: Minimize damage to public and private property

As noted in Chapter 2, the major impact of hazards is to people and improved property. Generally, natural hazards do not damage vacant areas. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements.

A fire break (brush and other fuel are cleared away from the building so a fire may not reach it) is an example of keeping a hazard away. Grass is kept short, leaves are raked, or overhanging tree limbs are trimmed.

Natural vegetation can be used to create snow or wind breaks to help provide protection to the property.

Flooding is also a hazard that can be kept away from a building. Some ways to do this are by erecting a barrier between the building and the source of flooding, or to move the building out of the floodprone area, elevate the building above the flood level, or if it is too damaged and not worth the previous measure the building could be demolished.

The measures listed above focused on keeping the hazard from reaching a building or damage-prone part of a property. An alternative is to modify the site or building to minimize or even prevent damage. There are many techniques to do this. This section looks at the measures that can be implemented to protect existing buildings from damage by winter storms, tornadoes and high winds, wildfires, and floods.

Winter storm retrofitting measures include improving insulation on older buildings and relocating water lines from outside walls to interior spaces. Windows can be sealed or covered with an extra layer of glass (storm windows) or plastic sheeting. Roofs can be made to shed heavy loads of snow and prevent ice dams that form when snow melts.

Burying utility lines is a measure that addresses the winds from tornadoes and thunderstorms and the ice that accompanies winter storms. Installing or incorporating backup power supplies minimizes the effects of power losses caused by downed lines. Trimming and maintaining trees to prevent limb breakage is another way to mitigate damages to utility lines from high wind or ice damage. Surge suppressors protect delicate appliances during thunderstorms.

Tornado retrofitting measures include constructing an underground shelter or “safe room” to protect the lives of the occupants. Improving bracing to reinforce a structure is another approach for tornadoes and **high winds** or to secure the roof, walls and foundation with adequate fasteners or tie downs. These help hold the building together when the combination of high wind and pressure differences work to pull the building apart.

A third tornado and high wind protection modification is to strengthening garage doors, windows and other large openings. If winds break the building’s “envelope,” the pressures on the structure are greatly increased.

Retrofitting approaches to protect buildings from the effects of **thunderstorms** include storm shutters, lightning rods, and strengthening connections and tie-downs (similar to tornado retrofitting). Roofs could be replaced with materials less susceptible to damage by hail, such as modified asphalt or formed steel shingles.

During the area’s frequent summer thunderstorms, **Kinross Charter Township’s** municipal water and wastewater systems experience frequent voltage surges and power outages. While the systems are equipped with surge protectors and other protective devices, these voltage surges cause damage to control systems that could result in a threat to public health through inadequate treatment of drinking water, draining of the water supply in the water tower, and/or inadequate treatment of sewage. The radio communication system that is designed to alert employees to problems in the system is also affected by these voltage surges, meaning that Township employees are not always aware that a problem exists. Because of the flat terrain in the area, the water tower and other utility structures in the area attract frequent lightning strikes, making this a recurring problem. The Township should research the availability of lightning-resistant control systems and purchase and install new equipment.

This project would safeguard the municipal water supply and insure continuing treatment of wastewater in the event of a power failure or surge. The updated equipment would also improve the Department of Public Works’ ability to respond to equipment breakdowns and/or loss of power in a timely manner by maintaining radio communications.

Flood retrofitting measures include **dry floodproofing** where all areas below the flood protection level are made watertight or **wet floodproofing** where water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Another flood protection modification addresses flooding caused by overloaded sanitary or combined sewers. Four approaches may be used to protect a structure against **sewer backup**: floor drain plugs, floor drain stand-pipes, overhead sewers, and backflow protection valves.

Insurance is not really a mitigative measure for hazards. However, it does help the owner repair, rebuild and possibly afford to incorporate some of the other mitigation measures to protect from future losses.

Insurance has the advantage that, as long as the policy is in force, the property is protected and no human intervention is needed for the measure to work. A standard **homeowner's insurance** policy will cover a property for the hazards of tornado, wind, hail, and winter storms.

Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the National Flood Insurance Program. **Flood insurance** coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area.

Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. There is limited coverage for basements and the below grade floors of bilevels and trilevels.

Several insurance companies have **sump pump failure** or **sewer backup coverage** that can be added to a homeowner's insurance policy. Each company has different amounts of coverage, exclusions, deductibles, and arrangements. Most are riders that cost extra. Most exclude damage from surface flooding that would be covered by a National Flood Insurance policy.

Larger local governments can self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can be a major drain on the treasury. Communities cannot expect Federal disaster assistance to make up the difference. Under Section 406(d) of the Stafford Act.

If an eligible insurable facility damaged by flooding is located in a [mapped floodplain] ... and the facility is not covered (or is underinsured) by flood insurance on the date of such flooding, FEMA is required to reduce Federal disaster assistance by the *maximum* amount of insurance proceeds that would have been received had the buildings and contents been fully covered under a National Flood Insurance Program (NFIP) standard flood insurance policy. [Generally, the maximum amount of proceeds for a non-residential property is \$500,000.]

[Communities] Need to:

- Identify all insurable facilities, and the type and amount of coverage (including deductibles and policy limits) for each. The anticipated insurance proceeds will be deducted from the total eligible damages to the facilities.
- Identify all facilities that have previously received Federal disaster assistance for which insurance was required. Determine if insurance has been maintained. *A failure to maintain the required insurance for the hazard that caused the disaster will render the facility ineligible for Public Assistance funding...*
- [Communities] *must* obtain and maintain insurance to cover [their] facility - buildings, equipment, contents, and vehicles - for the hazard that caused the damage in order to receive Public Assistance funding. Such coverage must, at a minimum, be in the amount of the eligible project

costs. FEMA will not provide assistance for that facility in future disasters if the requirement to purchase insurance is not met. – FEMA Response and Recovery Directorate Policy No. 9580.3, August 23, 2000

In other words, the law expects public agencies to be fully insured as a condition of receiving Federal disaster assistance.

Mitigation actions:

- Use natural plantings for snow/wind fences along major roadways
- Use Geographic Information System to identify and maintain database on critical areas
- Encourage participation in National Flood Insurance Program
- Adopt zoning/building codes that mitigate hazards

Objective: Provide alternative electrical and communication sources

Loss of electricity and communication can make the difference between life and death in some situations. Emergency operation centers and health facilities depend upon having the power and the ability to communicate during a crisis situation.

Electrical power can be lost due to downed power lines from ice or snowstorms, thunderstorms or lightning, high winds, falling trees or tree limbs. Flooding also can interrupt the power source.

During the winter, buildings that rely on electricity for heat will be most vulnerable if power is lost for extended periods of time. Facilities that use power to sustain life such as hospitals or nursing homes will be extremely vulnerable if a back-up power source is not available.

Communication between the County's Office of Emergency Service and first responders throughout the county is critical during a disastrous situation.

Mitigation actions:

- Provision of back-up generators for critical facilities
- Provision of back-up communication systems
- Burying of power lines
- Developing community forestry program with main goal of creating and maintaining disaster-resistant landscape in public rights-of way
- Protecting communication systems from lightning strikes
- Replace or renovate aging structures and equipment

Objective: Identify, evaluate, maintain, and upgrade infrastructure

By identifying and evaluating the infrastructure within the County, vulnerable areas can be determined and therefore damage control can begin before a disaster happens.

For example in **Kinross Township** following heavy rain events, stormwater runoff from airport runway and other large areas of impervious surface gathers and floods the access road around the runway at the Chippewa County International Airport. From there the runoff enters state land, where it is causing severe erosion in a red pine plantation. Contaminants typically found in stormwater runoff, such as oil residue, litter, salt and sand are being deposited in this pine plantation and along the roadway. The runoff across the roadway blocks access to the area, and has caused erosion of the roadway.

A stormwater detention basin should be constructed to capture and hold runoff before it enters the roadway and then the pine plantation. The detention basin would also allow contaminants to be contained in the basin rather than being deposited in the plantation and along the roadway.

In **Rudyard Township** an area at the intersection of Main Street and Mackinac Trail in the community of Rudyard periodically floods following heavy rain events. Drainage at the intersection is provided by a 2-foot by 2-foot box culvert that was reportedly installed many years ago when the Mackinac Trail was part of U.S. 2. When storm runoff exceeds the capacity of the culvert, water comes over Main Street and at times enters the sanitary sewer system, which has the potential to result in sanitary sewer overflows. The undersized culvert should be replaced with an adequate culvert and drainage structure which will divert runoff away from the community's streets and structures.

Addressing this problem will prevent damage to roadway, facilitate traffic flow during and following storms, prevent runoff from entering sanitary sewer system resulting in possible overflows and contamination.

Adding this layer to the geographic information system will provide an additional method for local officials to better assess where infrastructure can be better maintained or upgraded to be more disaster-resistant.

Mitigation actions:

- Develop a database of information on infrastructure systems
- Develop check lists and regularly inspect and maintain
- Determine areas that need to be addressed
- Determine solutions to problem areas

Objective: Employ hazard specific preventative measures

In meeting the County's goal to protect and minimize damage to critical facilities and infrastructure, known preventative measures should be employed.

Local governments should be involved in all strategies that can reduce flood losses, especially acquisition and conversion of a site to public open space. There are various roles the County or a municipality can play in encouraging and supporting implementation of these measures.

Government facilities: One of the first duties of a local government is to protect its own facilities. Fire stations, water treatment plants and other critical facilities should be a high priority for retrofitting projects and insurance coverage.

Often public agencies discover after the disaster that their “all-hazard” insurance policies do not cover the property for the type of damage incurred. Flood insurance is even more important as a mitigation measure because of the Stafford Act provisions discussed above.

Public Information: Providing basic information to property owners is the first step in supporting property protection measures. Owners need general information on what can be done. They need to see examples, preferably from nearby.

Acquisition agent: The community can be the focal point in an acquisition project. Most funding programs require a local public agency to sponsor the project. The County or a municipality could process the funding application, work with the owners, and provide some or all of the local share. In some cases, the local government would be the ultimate owner of the property, but in other cases another public agency could assume ownership and the attendant maintenance responsibilities.

Mandates: Mandates are considered a last resort if information and incentives aren’t enough to convince a property owner to take protective actions. An example of a retrofitting mandate is the requirement that many communities have that downspouts be disconnected from the sanitary sewer line.

Another possible mandate is to require less expensive hazard protection steps as a condition of a building permit. For example, many communities require upgraded electrical service as a condition of a home improvement project. If a person were to apply for a permit for electrical work, the community could require that the service box be moved above the base flood elevation or the installation of separate ground fault interrupter circuits in the basement.

Mitigation actions:

- Adopt “Firewise” and “StormReady” strategies and encourage public participation
- Acquire and preserve floodplain/open space areas

Conclusions

1. There are several ways to protect individual properties from damage by natural hazards. The advantages and disadvantages of each should be examined for each situation.

2. Property owners can implement some property protection measures at little cost, especially for sites in areas of low hazards (e.g., winter storms, thunderstorms, shallow flooding, and sewer backup).
3. Local government agencies can promote and support property protection measures through several activities, ranging from public information to financial incentives to full funding.
4. It is unlikely that most government properties, including critical facilities, have any special measures to protect them from flooding, tornadoes, and other natural hazards.

Recommendations

1. A standard checklist should be developed to evaluate a property's exposure to damage from the hazards most prevalent in Chippewa County: winter storms, wildfire, high winds, lightning, hail, flooding, and power losses from downed lines. It should include a review of insurance coverage and identify where more information can be found on appropriate property protection measures. The checklist should be provided to each agency participating in this planning process and made available to the general public.
2. Each public entity should evaluate its own properties using the standard checklist. A priority should be placed on determining critical facilities' vulnerability to damage and whether public properties are adequately insured
3. Each public entity should protect its own publicly-owned facilities with appropriate mitigation measure(s).
4. Because properties in floodplains will be damaged sometime, a special effort should be made to provide information and advice to floodplain property owners. Special attention should be given to high hazard areas.
5. All property protection projects should be voluntary. Other than State and Federally-mandated regulations, local incentives should be positive, such as providing financial assistance.
6. Public education materials should be developed to explain property protection measures that can help owners reduce their exposure to damage by natural hazards and the various types of insurance coverage that are available.
7. Communities could establish cost sharing programs, such as rebates, to encourage low cost (under \$10,000) property protection measures on private property, such as:
 - Surface and subsurface drainage improvements,
 - Berms and regrading for shallow surface flooding,
 - Sewer backup protection
 - Relocating furnaces and water heaters out of basements
 - Installing lightning rods