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Tornado/High Wind Vulnerability

Everyone is vulnerable to the powerful forces that accompany a tornado. There are those who are more vulnerable than others. For example:

- People in automobiles,
- People in mobile homes,
- People who may not understand warnings due to language barriers,
- The elderly and very young, and
- People with physical or mental impairments.

In the event of a tornado the City of Waverly has a system of outdoor warning sirens that, given enough time, allow people to search for suitable shelter. In addition to siren alerts in the community there are also a wide variety of early warning messages provided through local radio and television stations as well as the cable Weather Channel.

Again, as noted with thunderstorms and winter storms, within the city there exist groups that may be even more vulnerable to tornado and/or high wind events, specifically the elderly and disabled. These persons may not be able to reach safety in the event of a hazard event or a multi-hazard event that can result from a tornado or high wind event. At the time of the 2000 Census, there were a total of 2,208 persons over the age of 64 and/or disabled. In addition, there were 450 children under the age of five.

Also, at the time of the 2000 Census, there were 84 manufactured housing units in Waverly. Again using the average persons per household, there are approximately 198 persons living in manufactured housing units in Waverly.

Finally, persons living in some multi-family housing units may also be at risk, due to the lack of a proper tornado shelter. In 2000 there were 669 multi-family housing units in apartment buildings housing from 3 to 20 or more apartments, many of which are college dormitories. The average household size for renter occupied housing was 1.97 persons. Therefore, approximately 1,318 persons were living in multi-family housing units.

Flood Vulnerability

Populations living in the 100-year floodplain are also at risk of sustaining personal injury or property damage. According to the City, approximately 400 housing units currently remain in the 100-year floodplain. All of these structures are susceptible to flooding in the future. All of the residents of the houses are also vulnerable to damage from floodwaters. Again, assuming 2.34 persons per household, a total of 936 persons are currently living in the 100-year floodplain and would be extremely vulnerable in the event of a flood. In addition, if floodwaters were to irreparably damage all 400 homes, the property damage assessment would be approximately \$50,000,000. Finally, the blockage of major roadways by floodwaters could hamper the ability of emergency vehicles and crews, thereby increasing the vulnerability of the entire community.

Transportation Hazards

Historically, transportation events in the city have been limited to minor traffic accidents involving motor vehicles. Between 1990 and 1999 there was an average of 193 traffic accidents per year, an average of 6 injury crashes per year, and an average of \$473,466 in property damage each year. The average property damaged costs per accident was \$2,452. Therefore, for the average traffic accident there would be at a minimum two people involved, possibly injured, and there would be approximately \$2,452 in property damage resulting.

In the event of a train derailment, most of the damage would occur along the train route. There are few homes within a city block of the train tracks; therefore there likely would be no residential structural damage. There are some industrial sites and commercial sites located adjacent to the train tracks. Using assessed value information; if a train derailment were to destroy an industrial structure the damage would be approximately \$374,502 and if the train were to destroy a commercial building the damage would be approximately \$112,290. However, according to the Internet site www.cuerpo8.es, the average cost of damage by a train derailment in 2001 was \$105,000.

Communications Failure

Communications Failure, when it occurs can have a wide array of affects, ranging from extremely minimal to catastrophic. Communications failure resulting in the delayed response to a single house fire may affect a minimal number of people, on the average 2 to 3 people, however, the delayed response could result in the death of one or more of those residents. Communications failure in the form of a tornado siren failing to work could have more extreme consequences, affecting all 8,968 residents in the community.

Anyone who relies on technology such as telephones, are somewhat vulnerable to experiencing some type of communications failure. Phone and data transmission could be impacted. Most communication systems that are highly necessary have backup and redundant designs to provide continuity of service.

Watershed Pollution

In the event of groundwater contamination, the entire community would be vulnerable. In that case, a total of 8,968 persons would be affected; however, property damage would be minimal. Damage may be caused to the city wells and water tower, and some clean-up may be required.

Fire

Older structures with outdated electrical systems not built to current fire codes are particularly vulnerable to fire. Combustible building materials obviously are more vulnerable than structures constructed of steel or concrete. Structures without early detection devices are more likely to be completely destroyed before containment by response agencies. Structures in areas served by older, smaller, or otherwise inadequate water distribution infrastructure such as water mains and hydrants are also at significant risk. Problems vary from region to region, often as a result of climate, poverty, education, and demographics, but Iowa has about 13.4 fire deaths per million annually.

Throughout the history of the community, most of the fires have been limited to individual structures, directly affecting only that structure and its owners. However, there were two events in the early history of the city in which a large portion of the downtown was destroyed by fire. Due to the firefighting capabilities available today, such an event would be unlikely in modern times. Therefore, future fires will likely consist of small, contained house fires. In the event of a house fire, approximately three people would be affected and the damage estimate for a total loss would be approximately \$113,765. In the event that a commercial building was destroyed by fire, the damage estimate would be approximately \$112,290, and in the event that an industrial site was destroyed by fire, the damage estimate would be \$374,502.

Again within the city there exist groups that may be even more vulnerable to fire, specifically the elderly, disabled, and children. These persons may not be able to reach safety or may not be aware of the proper actions to take in the event of a fire. At the time of the 2000 Census, there were a total of 1,464 persons over the age of 65 in Waverly (representing 16% of the population). In addition, there were a total of 1,247 persons with disabilities in Waverly and 450 children under the age of 5.

Expansive Soils

The freeze and thaw of soils is unavoidable in the City of Waverly. The city does however plan to research alternative building methods which could reduce the negative impacts caused by this hazard on city infrastructure, such as roads.

Hazardous Materials

A hazardous materials accident can occur almost anywhere, so any area is considered vulnerable to an accident. People, pets, livestock, and vegetation in close proximity to facilities producing, storing, or transporting hazardous substances are at higher risk. Populations downstream, downwind, and downhill of a released substance are particularly vulnerable.

Depending on the characteristics of the substance released, a larger area may be in danger from explosion, absorption, injection, ingestion, or inhalation. Occupants of areas previously contaminated by a persistent material may also be harmed either directly or through consumption of contaminated food and water.

According to the Internet site www.spillcenter.com, the average hazardous materials spill involves over-the-road releases, and most of these involve fuels, such as diesel fuel. These spills generally involve broken crossover lines or ruptured saddle tanks. The average cost to clean up these spills in 2002 was \$9,200. If such a spill were to occur in Waverly, the number of people directly affected would be minimal. Most of the damage would occur on the roadways.

If the spill involved a dangerous chemical, evacuation may be required for a time. The City does have an emergency evacuation plan in place. With a city the size of Waverly, it is unlikely the entire town would be evacuated in the event of a large spill. However, if a portion of the city were evacuated, this would have at least a minimal impact on the remainder of the city.

Discovery of a methamphetamine lab in the city would generally have a minimal affect, only at the specific site of the lab. The exception to this would occur if the number of chemicals and condition of the site required the evacuation of neighboring properties. In that case, assuming that all residents in a city block were evacuated, on average there are 6 houses were on the block and 2.34 persons per household, a total of 10 people would be evacuated. As to costs for clean-up of the lab site, according to the internet site www.makesmartchoices.org, the average costs to clean-up a single average sized meth lab site is \$5,000, however, this cost can increase to as much as \$30,000 for larger sites.

Hazardous materials response facilities are required to have an off-site consequence plan that addresses the population of the surrounding area. Responding personnel are required to be trained to HAZMAT Operations Level to respond to the scene, and those personnel that come into direct contact with the substances released are required to have HAZMAT Technician level training.

The close proximity of the Northeast Iowa Response Group, located in northern Waterloo, will improve the likelihood of a quick response.

Dam Failure

Dwellings and other building structures located below the dam would be most vulnerable to failure. This dam is periodically inspected by the Department of Natural Resources. There is an existing dam plan, which the dam operator would utilize in a situation of dam failure.

Grass/ Wild land Fires

The area surrounding Waverly is primarily agricultural. During typical periods of drought in late fall and early spring, cornfields, grass ditches and fields designated for set-aside are highly vulnerable to fire. These fires start and spread incredibly fast. They are also very difficult to contain and extinguish. The committee also felt areas where open burning and ditch burning are permitted were highly vulnerable to damage.

To address these concerns, mutual aid agreements and communication between city and other local fire departments is essential. Open burning is generally only permitted during certain times of the year and is controlled by the local fire department.

Excessive Heat

Everyone in the planning area is susceptible to the impacts of a heat wave/extreme heat event. Those who have an elevated risk include the elderly, young children, chronic invalids, those on certain medications or drugs, persons who are over their recommended weight, alcoholics, and individuals who work outdoors or in confined spaces without air conditioning. Furthermore, income can figure into the vulnerability. Those individuals or families who cannot afford air conditioning or do not have access to air conditioning are also more susceptible to the effects of elevated temperatures.

At the time of the 2000 Census, there were a total of 1,464 persons over the age of 64 in Waverly and a total of 1,247 persons with disabilities. In addition, there were 45 families and 477 individuals living in poverty.

The amount of vulnerability can be greatly reduced by taking certain precautionary measures. Such measure include, but are not limited to drinking plenty of water to stay hydrated, staying in air conditioned areas, using sun block, reducing the amount of physical exertion normally expended, etc.

Explosion

Most explosions occur in a single area or structure. Common causes of explosions in Iowa include leaking gas lines in structures, puncture of gas lines by construction crews or home and business owners doing construction work, and grain elevators exploding from pressure. In the event that one of these types of explosions was to occur, some damage may occur to surrounding structures, depending on the proximity of those structures to the explosion site. A house explosion could cause approximately \$113,765 in damage to the structure itself. In addition, an explosion at a commercial site could cause approximately \$112,290 in damage (assuming a total loss) and an explosion at one of the city's industrial sites could cause approximately \$374,502 (again, assuming a total loss).

Terrorism

The most glaring vulnerability appears to be in one of four following areas:

The first area would be a direct assault on the water supply that serves the local population. This contamination would likely occur at the storage point for that water (i.e. water tower). This is one scenario for a direct assault on the City of Waverly.

The second susceptibility to terrorism that would likely have some effect on the residents of the community would be a contamination of the food supply. This is, perhaps, the most extreme concern facing the Midwestern region of the United States today. Bio-terrorism may take the form of a release of genetic diseases against crops or livestock. In addition to the extreme loss of life that could occur from such an attack, at the very least it would result in dramatic financial consequences to the agriculture industry. Agriculture is widely recognized as an industry that the City, the State of Iowa, and all the residents therein are largely dependent on.

The third major potential threat exists due to the community's geographic proximity to a nuclear power plant. The single-unit plant at the Duane Arnold Energy Center is located in Palo, Iowa, 8 miles northwest of Cedar Rapids. Theoretically, although not very likely, this nuclear reactor could be sent into a manmade meltdown infecting everyone within an unknown radius of the plant with radioactive contamination. The City is considered to be outside the area that would be directly impacted by an event at the plant under normal weather circumstances. However, it could still have some indirect effects on the community.

The fourth major area susceptible to terrorism is the community's schools. Because of the unpredictability of terrorism, any imaginable scenario is possible, and therefore an open mind should be kept when considering potential threats in the community's school system.

In order to more fully address this issue local law enforcement agencies, fire departments, hospitals, and other responding agencies are cooperating in order to identify, evaluate, and rank the locations of potential targets in the community. Facilities that are identified on this list are considered potentially attractive targets, for any variety of reasons, to be targeted by a terrorist group.

Earthquake

Even though most of Iowa is in Seismic Zone 0, the lowest risk zone in the country, if an earthquake were to occur, the entire community, 8,968 persons, would be vulnerable to damage. The structures most at risk for damage would be those structures built on poor soil, such as a floodplain. It is expected that if an earthquake were to occur, the damage would be limited to the shifting of buildings off of their foundations, cracked plaster on walls and ceilings, and perhaps some bowed walls. Underground utilities would be at greater risk of damage during the winter season if the ground were frozen to depths of four feet or greater.

Assuming the structures in the floodplain were the most susceptible to damage from an earthquake, 400 structures would be at risk for structural damage. If those 400 houses were damaged beyond repair, the damage assessment would come in at approximately \$50,000,000. However, if they structures in an earthquake were damaged beyond repair there would also be damage to other structures in the city. Such a damage assessment would be difficult to determine.

Drought

While the entire community would be affected by drought, those dependent on rain would be the most vulnerable. This means that agriculture, agribusiness, and consumers (if the drought lasted long enough or impacted a large area) would be impacted. A drought limits the ability to produce goods and provide services. Because citizens draw their drinking water from surface water and groundwater sources, a prolonged severe drought may impact all citizens if there were to be a dramatic drop in the stream flow coupled with the drop in the water table. In addition, while a drought may not cause structural damage to properties, a drought could cause damage to the city utilities, especially the water and well system. Fire suppression can also become a problem due to the dryness of the vegetation and possible lack of water.

Disease

The impact of disease on the city would depend upon the type of disease. An animal disease would have a mostly economic impact on the city, as its economy is largely based on agriculture. The risk of disease in animals can be largely reduced by ensuring domesticated animals receive the proper nutrition in their diet, living areas are kept as dry as possible, sick animals are quickly identified and treated, proper vaccinations are administered, and dead animals are quickly and properly disposed. However, if residents of Waverly were to become infected with an infectious disease, the very young and the very old would be most at risk. These persons may not be able to fight off the disease as easily as other portions of the population. At the time of the 2000 Census, there were a total of 1,464 persons over the age of 65 in Waverly (representing 16% of the population) and there were 450 children under the age of five.

Implementing certain precautionary measures can reduce the amount of vulnerability. Some precautions for humans include education on how diseases are contracted and/or spread, cleanliness, safe food handling practices, vaccinations, implementing monitoring programs, and practicing safe sex measures.

Nuclear

If the City were to be affected by a nuclear event, it would most likely in the form of people relocating from the area surrounding Palo and the nuclear plant there. This relocation would most likely be the result of a accident or incident at the plant. If this were to occur, all 8,968 persons in the city would feel the results of temporarily hosting the relocated persons.

In the event that the City was the target of a direct nuclear strike, again the entire city would be affected fatally, representing all 8,968 persons. In addition, all property located in the city would be destroyed.

Riot/Violent Demonstration

The impact of a civil disturbance on the city is hard to predict. Much would depend upon the nature of the disturbance and the size of the crowd. Civil disturbances in other cities have caused much property damage, personal injury, and even death. At the least, each resident would be impacted by the civil disturbance and the after effects.

Sinkholes

The impact of sinkholes would be minimal. Sinkholes in or near the city have been small and have caused minimal damage.

Levee Failure

Residents, dwellings and building structures located behind levees are clearly most vulnerable if a levee breaks. Levees are designed to hold water in the primary water channel. Rising water levels place great pressure on levee walls. Levees cause water levels to rise, which in turn result in a much faster flow. A breach in the levee results in the detained water spilling into an area the levee was designed to protect. The same impact results when the water level exceeds the height of the levee.

Proper maintenance and periodical inspections would be required to confirm structural integrity if future levee's were constructed in the City of Waverly.

Land Slides/ Mud Flows

Areas subject to land slides or mud flows would likely be located near the Cedar River. River banks are typically steep sloping and shed much water. Flat lying areas generally absorb the majority of water and become far less saturated than sloping areas. Building structures located near sloping areas could force saturated soil to break free, which would ultimately result in a land slide or mud flow. Building structures at the top and bottom of steep sloping river banks would be significantly impacted by either of these hazards.

The committee felt the implementation of a future land use and zoning policy would be useful for reducing the negative impact of these hazards. Preventing building near the top or bottom of steep sloping hills, subject to land slides and/or mud flows will be examined.

CURRENT MITIGATION ACTIVITIES

Emergency Services

Emergency Management Coordinator

Bremer County's Emergency Management Coordinator is based out of the City of Waverly, the county seat. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the county. Although the Emergency Management Coordinator is accountable to the entire county, the location of the office in the Bremer County Courthouse is beneficial to the City of Waverly. The current Emergency Management Coordinator is Kip Ladage and the current contact information is as follows:

Bremer County Courthouse
415 East Bremer
Waverly, Iowa 50677
319-352-0133
email address: kladage@co.bremer.ia.us

Fire Department

Fire protection is provided for Waverly with an authorized force of 30-40 part-time firemen. Fire equipment includes three fire-fighting trucks, two tanker trucks, and one rescue unit. The fire station is located in the central part of the city on the west side of the Cedar River. Waverly's rating for insurance is Class 5 within city limits.

Equipment used by the Waverly Fire Department include the following:

3 Pumper Trucks
2 Tankers
Diving Equipment
Rescue Van
100' Aerial
4 x 4 Gras Rig
Boat
All-terrain rescue/ small fire vehicle

Mutual Aid agreements have been signed with every fire department in Bremer County and the Waverly Fire Department (Bremer County).

Dennis Happel is the current Chief for the department. Contact information for the Waverly fire department is as follows:

Waverly Fire Department
121 1st Street SW
Waverly, IA 50677
(319) 352-5521

Medical Services

Waverly is served by one local hospital:

Waverly Health Center
312 9th Street NW
Waverly, IA 50677
(319) 352-4121

There are six other hospitals available in a 25-mile radius of the City of Waverly. Within Waverly Covenant Medical Center of Waterloo owns and operates a clinic. Furthermore, there are clinics held at Waverly Municipal, and Integra Health has an office in Waverly. These facilities are in addition to the many small doctor's offices and small clinics in the community.

The hospital has a landing area for Life Flight helicopters. Helicopters arrive generally from one of three hospitals; Mayo Clinic of Rochester, MN; Covenant Medical Center of Waterloo, IA; and University of Iowa Hospitals and Clinics of Iowa City, IA.

Emergency rescue and ambulance service is provided by the hospital throughout and beyond the city limits.

Police

Police protection is provided by the Waverly Police Department, Bremer County Sheriff Department, and the Iowa State Patrol. Currently, there are a total of 15 sworn officers and 1 full-time secretary serving the Police Department. The Police department shares a building with the Bremer County Sheriff's Department. Richard Pursell is the current Police Chief for the department. Contact information is as follows:

Waverly Police Department
111 4th Street NE
Waverly, IA 50677
(319) 352-5400

Hazardous Materials

The City of Waverly contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center it also serves as a hazardous materials quick response unit to Bremer County, surrounding counties, and many municipalities in a ten county region. The Unit provides local fire departments with hazardous materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities with the local department. Contact information for the facility is as follows:

Hazardous Materials Regional Training Center
1925 Newell Street
Waterloo, Iowa 50707
Phone: (319) 291-4275
Toll Free: (800) 291-4682
Fax: (319) 291-4285

The City is also a partner in the Tri-County Drug Task Force. This group works with the city in the event of the discovery of a methamphetamine lab within city limits. The Task Force exists to assist the city Police Department in containment of the site and disposal of the hazardous chemicals.

Warning Systems

The outdoor early warning sirens are relatively new. The first test of the new system took place in 2001. In addition to this state of the art warning system, some facilities in the City of Waverly still maintain and use the Plectron Warning System.

NOAA Weather Radio broadcasts are also available in the community. NOAA Radio's provide up to the minute weather related alerts. Other locations that warnings and watches can be found are television, Internet, and radio (KWAY and KWAR are local broadcasts).

PROPERTY PROTECTION

As a result of the 1999 Flood and a Federal Disaster Declaration the City participated in a Structural Acquisition program funded through FEMA, IDED, and the Iowa Emergency Management Division (IEMD). There have been three phases of housing buyouts. The first two required matching funds to the IEMD. The City developed a list of structures that would be candidates for buyout. This list was then forwarded to FEMA where a cost/benefit analysis was performed. In all, the funds were used to purchase 10 homes in the city along the Cedar River. A total of \$444,847 was spent in the purchase of the homes. An additional \$11,150 was spent for the relocation of tenants living in two homes that were rental properties. The intent of buying out houses in the flood plain is to remove people from harms way.

As a result of the 2008 Flood the City is planning to participate again in a Structural Acquisition program funded through FEMA and Iowa Homeland Security Emergency Management. The city proposed in a grant application submitted in December of 2008 that 74 homes primarily in the floodway and 100 year flood plain be bought out.

Repetitive Loss Information

According to information obtained from the FEMA NFIP Repetitive Loss County Summary for the State of Iowa (6/30/2001) the City of Waverly had nine properties claim 18 losses during the 1990's. Cumulative NFIP payments as a result of the 1993 and 1999 flooding resulted in total payments of \$199,263.12 to the insured property owners. This figure included payments for Building Damage (\$187,357.28) and Contents Damage (\$11,905.84). The average payment for these claims was \$11,070.17. These properties were dispersed throughout the community and were all built prior to March 2nd, 1981 (the date of Waverly's entrance into the NFIP). Payments per structure were as follows:

| <u>Zone</u> | <u>Building Value</u> | <u>Total Building Payments</u> | <u>Total Contents Payments</u> | <u>Total Payments Made for Structure</u> |
|---------------|-----------------------|--------------------------------|--------------------------------|--|
| B | \$140,052 | \$11,956.42 | \$0.00 | \$11,956.42 |
| AE | \$49,700 | \$7,192.81 | \$0.00 | \$7,192.81 |
| A11 | \$114,985 | \$3,678.42 | \$0.00 | \$3,678.42 |
| A11 | \$104,900 | \$6,878.83 | \$0.00 | \$6,878.83 |
| AE | \$216,546 | \$86,518.35 | \$10,000.00 | \$96,518.35 |
| AE | \$96,492 | \$8,328.57 | \$0.00 | \$8,328.57 |
| A07 | \$154,456 | \$5,134.60 | \$0.00 | \$5,134.60 |
| AE | \$98,740 | \$45,954.62 | \$953.20 | \$46,907.82 |
| A | \$63,870 | \$11,714.66 | \$952.64 | \$12,667.30 |
| Totals | \$1,039,741 | \$187,357.28 | \$11,905.84 | \$199,263.12 |

Flood Research

Although there have been many studies concerning flooding in Waverly, three studies in particular have had a significant impact on the understanding and mitigation of problems in the city.

In 1980 the Federal Emergency Management Agency conducted a standard Flood Insurance Study for the City of Waverly. The study looked at flooding from three primary sources: the Cedar River, Unnamed Creek, and Dry Run Creek. The study reflects 100 and 500-year flood levels for rivers and streams located in the unincorporated portions of Waverly. It is this study and the corresponding Flood Insurance Rate Maps that are used to enforce the county's flood plain ordinance. These maps were updated in 1989 as part of a Flood Insurance Study for all of Bremer County.

In January of 1980 the Dry Run Creek Drainage and Flood Control Study was prepared for the City of Waverly by Brice, Petrides & Associates, Inc. of Waterloo, IA. This study looked at the flooding characteristics of Dry Run Creek in Waverly. It then delineated the flood plain and identified flood problem areas. The plan then reviewed, in detail, solutions to the identified problems.

In wake of the 1999 Cedar River flooding in Waverly, a report was conducted in order to identify projects that would mitigate the effects that future events would have on the city. The report was simply titled Waverly Flood Study. It was prepared for the City of Waverly by Stanley Consultants, Inc. This plan identified several projects and discussed impact and funding of the projects. The solutions derived from this study were incorporated into the alternatives section of the previous plan.

Stanley Consultants reviewed the Waverly Flood Study in the winter of 2008, following record event flooding in the prior summer. Stanley Consultants focused much research on the city's intentions to construct an inflatable dam and address flash flooding concerns in the Dry Run Creek.

Floodplain Management

On September 2nd, 1980 the City of Waverly became active members in the National Flood Insurance Program (NFIP) by adopting its initial floodplain ordinance. The Federal Insurance Administration manages the insurance component of the NFIP, and works closely with FEMA's Mitigation Directorate, which oversees the floodplain management aspect of the program. The city updated the Floodplain Ordinance most recently in the year 1996. The Floodplain Ordinance is a portion of the city's Zoning Ordinance. In accordance with NFIP guidelines, the ordinance does not allow for new construction within the floodplain. In addition, it requires those structures within the 100-year flood to: (a.) "be adequately anchored to prevent flotation, collapse or lateral movement of the structure"; (b.) "be constructed with materials and utility equipment resistant to flood damage" and; (c) "be constructed by methods and practices that minimize flood damage."

Floodplain management efforts have been made with the construction of several detention ponds in Waverly. These detention ponds are thought to have a tremendous impact on the Dry Run Creek flooding situation. Dry Run Creek is a creek that historically has flooded due to heavy localized rains. The result is flash floods, much different than the floods of the Cedar River, which usually are accompanied with substantial warning time. The detention ponds are expected to help control the water in the Dry Run Creek area.

OTHER MITIGATION ACTIVITIES

Earthquake

The city has and enforces a building code. Currently there are no multi-story buildings in the community over three stories tall. The grain elevator is the one exception to this rule. It is expected that earthquake damage would be limited to the shifting of buildings off of their foundations, cracked plaster on walls and ceilings, and perhaps some bowed walls. Underground utilities would be at greater risk of damage during the winter season if the ground was frozen to depths of four feet or greater.

Tornado/High Wind Event

Tornadoes have been known to cause great destruction. They have been recorded destroying entire buildings and it is not uncommon to hear of a tornado tearing off the roof of a house. This being the case it is important that mitigation efforts are made to protect people from this deadly force.

The most important measure in reducing the threat of injury is to be aware of the oncoming danger. The City of Waverly has new sirens in place that cover the entire populated area of the city. Each one of these sirens is equipped with a battery back up to ensure operation in the event of a power failure. In the event of a tornado, the spotter contacts the dispatcher at Law Center who then activates the tornado sirens.

In addition to siren alerts in the community there are also a wide variety of early warning messages provided through local radio and television stations as well as the cable Weather Channel. Furthermore, the National Oceanic and Atmospheric Administration (NOAA) Weather Radio provides an alternative media source for weather information. NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby [National Weather Service office](#). NOAA Weather Radio broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day.

There have been discussions during the preparation of this document on the feasibility of educating the public about Tornado Safe Rooms. Properly built safe rooms can provide protection against winds of up to 250 miles per hour and against flying objects traveling as fast as 100 miles per hour. Some safe rooms have been tested to withstand up to the 250 mph winds. The idea behind safe rooms is that they are built inside but separate from the main house. The walls and ceilings are extra thick and strong so that the safe room remains standing and intact even if high winds and flying objects destroy the rest of the house.

A tornado safe room may be built inside a house where it is easy to retreat to. It must be anchored to the house foundation to resist overturning and uplift. The connections between all parts of the shelter must be very strong and the walls, roof and door must be strong enough not to be penetrated by flying objects.

Another option discussed was the feasibility of the construction of a large tornado safe shelter at the community fairgrounds.

Information regarding how to protect ones self in the event of a tornado is largely publicized in the form of flyers, radio, newspaper, and television announcements. The following is an example of the types of actions that should be taken in the event of a storm:

Tornado Safety Rules

1. In a home or building, move to a pre-designated shelter, such as a basement.
2. If an underground shelter is not available, move to a small interior room or hallway on the lowest floor and get under a sturdy piece of furniture. Put as many walls as possible between you and the outside.
3. Stay away from windows.
4. Get out of automobiles.
5. Do not try to outrun a tornado in your car; instead, leave it immediately for safe shelter. If caught outside or in a vehicle, lie flat in a nearby ditch or depression and cover your head with your hands.
6. Highway overpasses do not provide shelter from tornado winds.
7. Be aware of flying debris. Flying debris from tornadoes causes most fatalities and injuries.
8. Mobile homes, even if tied down, offer little protection from tornadoes. You should leave a mobile home and go to the lowest floor of a sturdy nearby building or a storm shelter.

Winter Storm

The City of Waverly relies on forecasting efforts to predict the onset of a winter storm. Current technology usually allows for days of notice before the arrival of a major winter storm.

The NOAA estimates that approximately 70 percent of all deaths attributed to winter storms occur in an automobile. Therefore the City of Waverly views proper snow and ice removal from roadways to be essential in mitigating negative effects of these events. Snow removal and ice prevention techniques are practiced by city and state employees on the corresponding local and state roadways within the city limits. The following is equipment currently at the disposal of the Waverly Public Works department that can be used for snow and ice removal:

- Two Graders
- Two End Loaders
- Seven Plow Trucks
- Two Small Plows for One Ton Truck
- Rotary Blower that can be mounted on and End Loader

The City also has a snow ordinance that is in effect during snow season. This ordinance serves to assist the City in its efforts to clear the city streets after a snow event.

In an ideal winter storm scenario it is estimated that all of the city roads can be adequately cleared within six hours or less barring continued moisture or high winds. In this scenario travel would be reasonable in two hours time.

Drought

Drought is a concern for any community, but especially for communities with agricultural ties. Drought can have extremely adverse effects on crops, livestock, finances, and can even increase stress levels. The City of Waverly has never experienced a drought of such magnitude that it had to take any significant measures to mitigate the effects.

Fire and municipal water could be affected in the case of severe drought lowering the water table to levels that would render the city wells ineffectual. The dam acts as a mitigating effort against drought. The dam would provide a filling area that could be accessed by fire fighting equipment if need be for quick access to water in times of low water tables.

Shelters

Under the auspices of the County Emergency Management office, Bremer County has compiled a list of shelters within each community. The list includes such information such as location, heating source, water source, overall capacity, sleeping capacity, and feeding capacity. The details of the list can be found in full in the "*Contingency Plan for Bremer County*." The list of shelters within Waverly included the following:

- St. Johns Lutheran Church - 311 4th Ave SW
- Trinity United Methodist Church - 1400 W Bremer Ave
- Bartels Home - 1922 5th Ave NW
- Waverly Municipal Hospital - 312 9th St SW
- Bremer County Courthouse - 415 E Bremer Ave
- Waverly-Waverly Jr. High School - 215 3rd St NW
- Wartburg College
 - Becker Science Hall - 111 10th St. NW
- Field House - 1015 2nd Ave NW
- Knights Gym - 231 10th St. NW
- Luther Hall - 200 9th St NW
- The W-

It should be noted that there are several other structures that could serve as suitable shelters in certain events. The above list consists of those structures that meet the specific requirements of a fallout shelter as defined by the State of Iowa. The Emergency Management Coordinator is responsible for reviewing the fallout shelter compliance of the above named structures during the regular plan reviews.

Communications

Waverly currently has in place E911 Emergency Assistance. The E911 System is administered through the City of Waverly-Bremer County Law Office. Other communications used by city personnel include pagers, radios, and cellular phones.

Radio, television, cellular telephones, landline telephones, newspapers, warning sirens, and NOAA Radio Service are available to the public at large.

Communication of upstream river depths has been important in being able to predict river levels. With a river gage in Charles City (upstream on the Cedar River from Waverly) and a newly placed river gage near the Horton Road bridge forecasting river crests has become a very accurate endeavor. The advancement of real-time data has been very influential in these efforts.

During past hazards such as the 1999 and 2008 Floods, emergency services were coordinated from the public works department, which also serves as the emergency response center. This facility is old and not an ideal venue for coordinating disaster services. The committee identified the need for a new or alternative site from which to coordinate these activities.

On June 19th, 2000 an official Flood Communication Protocol was officially adopted by the City Council of the City of Waverly. This document was prepared in order to develop a consistent method for notice to citizens regarding high water and flood conditions on the Cedar River. This document can be seen as a portion of this document. Please refer to Attachment

The newest form of communication available in Waverly is that of the Internet. The City has developed a website in order to keep it's citizens, and other interested parties, aware of local and government affairs. The website address is www.waverlyia.com.

Also on the City's website is a link to the Code Red Service, which is available to all citizens. The Code Red Service acts as a reverse 911 system. In the event of an emergency/hazard the system would activate, essentially contacting each citizen residing within harms way with an automated message, warning them of potential danger. All citizens listed in the City's phone directory are automatically entered into the system. Citizens also have the ability to enter a cell phone, work phone, and other additional alternative phone numbers into the system. Bremer County Emergency Management is responsible for contacting Code Red with the appropriate warning. County Sheriff's Department, City Police, and Fire will coordinate with Emergency Management to communicate accurate information in a timely manner.

HAZARD MITIGATION PLAN GOALS

The hazard mitigation plan goals were reviewed by the Waverly Hazard Mitigation Planning Committee at their second committee meeting. The committee set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

Hazard Mitigation Plan Goals

1. Reduce the chance of and impact of flooding in the community.
2. Take measures to minimize the occurrence of injuries and loss of life due to hazards.
3. Take measures to minimize or eliminate damages that may occur as a result of hazards.
4. Increase the city's ability to respond to natural disasters and man made hazards.
5. Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.
6. Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.
7. Continually re-assess and re-evaluate the plan and mitigation activities.

Each of the mitigation activities identified as a "Future Hazard Mitigation Activity" in the section below can be related to at least one of the hazard mitigation plan goals.

FUTURE HAZARD MITIGATION ACTIVITIES

While the mitigation activities discussed above detail the City's efforts to mitigate hazards when possible and to respond to hazards in a timely and efficient manner, the City also recognizes that there are many more mitigation activities and projects that would benefit the residents of Waverly. The Hazard Mitigation Planning Committee recognized this fact and developed a list of future hazard mitigation activities that, if accomplished, would serve to further mitigate hazards to the community. The activities are listed out below by hazard. In addition, the hazards are listed according to their ranking completed in the hazard analysis section of the plan.

Finally, included at the end of the hazards and mitigation activities is a list of activities for emergency management services. These are activities that will increase the city's ability to respond to all hazards.

Winter Storm Mitigation Activities

1. Continue to enforce tree inspection and trimming program.
2. Continue enforcement of snow ordinance.
3. Purchase new generators to provide emergency power in times of need.
4. Portable power generation
5. Power generation for police and fire
6. Power generation for storm shelters

Thunderstorm/Lightning/Hail Mitigation Activities

1. Continue to install and update surge protectors on major electric lines.
2. Work with local utility to develop a program for the burying of existing lines.
3. Continue to enforce tree inspection and trimming program.
4. Systematically review, make necessary updates to, and enforce building code requirements.
5. Develop a NOAA Weather Radio awareness program.
6. Continue to utilize and develop the Code Red System
7. Continue to recruit volunteer first responders, market opportunities

Tornado/High Wind Mitigation Activities

1. Improve public awareness of proper steps to be taken in the event of a possible tornado.
2. Develop a "Tornado Safe Room" awareness program.
3. Work with local utility to develop a program for the burying of existing lines.
4. Systematically review, make necessary updates to, and enforce building code requirements.
5. Continue to enforce tree inspection and trimming program.
6. Expand weather spotter training.
7. Develop a NOAA Weather Radio awareness program.
8. Research and secure grant dollars for shelter and safe room construction
9. Construct additional storm shelters and tornado safe rooms
10. Retrofit current facilities to include tornado safe rooms
11. Encourage including tornado safe rooms in newly constructed public facilities

Flood (Riverine & Flash) Mitigation Activities

1. Consider replacing the existing power dam with an Inflatable Dam.
2. Continue Participation in the National Flood Insurance Program.
3. Continue further development of and update of the Storm Water Management Program.
4. Maintain, enforce, and update Zoning and Floodplain Ordinances as needed.
5. Ensure proper training and certification of Floodplain Manager(s).
6. Continue acquisition and removal of homes from the floodplain.
7. Flood proof of structures in the floodplain.
8. Replace or Increase Capacity of 3rd Street Bridge.
9. Consider construction of a levee, floodwall, or other flood protection system in Kohlmann Park.
10. Construct floodwalls along the east bank of the river across from Kohlmann Park.
11. Implement projects identified for the Cedar Lane Bike Path.
12. Construct a dike and levee system in SE Waverly, near SE 7th Avenue
13. Enhance and maintain storm sewer capacity
14. Create a regional plan to address flooding concerns
 - *Wetland Areas
 - *Detention Ponds
15. Monitor and enforce drainage regulations on residential, commercial and industrial developments

16. Consider dredging the river
17. Complete the Dry Run Creek obstruction and flash flooding analysis and consider other mitigation activities.
 - *3rd Street Bridge Removal
 - *Cedar River Trail Bridge Removal
18. Purchase removable, portable flood barriers
19. Create a flood mitigation and evacuation brochure
20. Develop a flood response protocol for response, sand bagging and evacuation procedures
21. Continue to study additional mitigation alternative for SE Waverly

Transportation Hazard Mitigation Activities

1. Continue to provide necessary training to Fire Department personnel, Police Department personnel, and ambulance crews.
2. Maintain existing agreements with surrounding communities for mutual aid emergency assistance.
3. Educate local residents about safe driving techniques.
4. Enforce existing laws
5. Manage traffic control signals
6. Upgrade current traffic signals
 - *Integrate pedestrian friendly features
 - *ADA friendly features
 - *Alternative lighting schemes
7. Research railway concerns
8. Study and potentially consider the 10th Street Southeast extension/bridge.

Communications Failure Mitigation Activities

1. Upgrade radio communications equipment as needed.
2. Regularly review and amend Fire, Medical, and Hazardous Material response standard operating procedures.
3. Purchase new generators to provide emergency power in times of need.
4. Continue to develop and maintain Crisis Communication Plan
5. Enhance coordination of disaster plans in the community

Watershed Pollution Mitigation Activities

1. Follow monitoring requirements set forth by the Iowa Department of Natural Resources.
2. Continue further development of and update of the Storm Water Management Program.
3. Continue Wastewater Facility Storm Water Program.

Fire Mitigation Activities

1. Continue to provide necessary training to Fire Department personnel, Police Department personnel, ambulance crews and hospital staff.
2. Maintain existing and purchase new firefighting equipment as needed.
3. Upgrade radio communications equipment as needed.
4. Maintain existing Mutual Aid agreements with surrounding communities for mutual aid emergency assistance.
5. Systematically review, make necessary updates to, and enforce building code requirements.
6. Enforce City guidelines for burning.
7. Create an annual fire inspection program for commercial and industrial properties.
8. Create a bay at an alternate site that can serve as an emergency storage site for emergency vehicles.
9. Continue to update and install surge protectors on major electric lines.
10. Purchase new generators to provide emergency power in times of need.
11. Create and participate in an annual fire inspection program
12. Develop a comprehensive list of alternative routes for different fire scenarios
13. Enhance communication amongst the private sector, public sector, media outlets and citizens.
14. Develop the 10th Avenue Southeast Extension

Expansive Soils

1. Educate the public on potential hazards
2. Utilize water sampling as required
3. Map vulnerable areas

Hazardous Materials Mitigation Activities (Including Methamphetamine Labs)

1. Continue to provide necessary training to Fire Department personnel, Police Department personnel, ambulance crews, first responders, and hospital staff.
2. Provide hazardous materials education for industry and community, including household chemical education.
3. Continue working relationship with Tri-County Drug Task Force.
4. Maintain existing agreements with surrounding communities for mutual aid assistance.

Dam Failure Mitigation Activities

1. If retained continue to make necessary inspections and repairs to existing dam.
2. Consider replacing the Power Dam with Inflatable Dam.

Grass/Wild land Fires

1. Educate the public
2. Information on the proper ditch and open burning, when permitted, who to contact in case of an emergency, how to recognize the presence of explosive gasses, how to contain and manage an approved open fire and/or ditch burning, and how to react in the event of a fire.
3. Identify alternative water sources whether they be dry hydrants, ponds, etc.
4. Ensure that appropriate organizations are equipped and trained in the event of a grass or wild land fire.
5. Maintain Mutual Aid Agreements between fire departments in the surrounding region.
*Maintain membership in the Iowa Mutual Aid Compact.
6. Maintain fire department equipment and personnel training.
7. Maintain inter-governmental cooperation (i.e. cost sharing, etc.)

Extreme Heat Mitigation Activities

1. Establish local "Cooling Sites" for at risk populations such as the elderly and/or disabled.

Explosion Mitigation Activities

1. Continue to provide necessary training to Fire Department personnel, Police Department personnel, hospital staff, first responders and ambulance crews.
2. Maintain existing Mutual Aid agreements with surrounding communities for mutual aid emergency assistance.
3. Encourage local utilities to upgrade equipment used to locate and identify underground utility lines.
4. Upgrade radio communications equipment as needed.
5. Purchase new generators to provide emergency power in times of need.

Terrorism Mitigation Activities (Including All Types of Terrorism)

1. Continue to review and update Incident Command procedures and implement training and exercises for the appropriate agencies.
2. Evaluate current terrorism mitigation efforts.
3. Increase measures taken to protect and secure the city's critical infrastructure.

Earthquake Mitigation Activities

1. Systematically review, make necessary updates to, and enforce building code requirements.
2. Develop the proper steps to be taken in the event of an earthquake and communicate these procedures to the public.

Drought Mitigation Activities

1. Continue to enforce City/County guidelines for burning.
2. Purchase new generators to provide emergency power in times of need.

Disease Mitigation Activities

1. Educate the community about dangerous human and animal diseases.
2. Adhere to the Quarantine Plan
3. Adhere to the current FAD (foreign animal disease) Plan
4. Implement training and exercises for appropriate agencies and personnel
5. Evaluate equipment and personnel capacity

Nuclear Event Mitigation Activities

1. Continue to review and update Incident Command procedures.
2. Determine possible sheltering locations to be used in the event of a nuclear emergency
3. Monitor the transportation of radioactive chemicals, to the best of city's ability

Riot/Violent Demonstration Mitigation Activities

1. Ensure police, other public safety officials and hospital staff has proper training.
2. Purchase specialized equipment as needed.

Sinkhole Mitigation Activities

1. Educate city personnel and the public regarding sinkholes.

Levee Failure

1. Educate the public

Bridge Failure Mitigation Activities

1. Continue bridge inspection program.
2. Explore replacement alternatives for bridges
3. Study and potentially consider the 10th Street Southeast extension/bridge.

Land Slides/ Mud Flows

1. Educate the public on the dangers of land slides and mud flows.
2. Create a zoning ordinance restricting building near the top and bottom of steep sloping cliffs and hills. Residential, commercial and infrastructure restrictions.
3. Discourage the clearing of trees and shrubbery from cliffs and steep sloping hills.

Emergency Management Activities

1. Update Emergency Response Plan.
2. Review and update Incident Command process as needed.
3. Develop a Continuity of Operations Plan.
4. Continue to provide necessary training to Fire Department personnel, Police Department Personnel, hospital staff, first responders and ambulance crews.
5. Maintain existing and purchase fire, police, and ambulance equipment as needed.
6. Regularly review and amend Fire, Medical, and Hazardous Material response standard operating procedures.
7. Maintain existing Mutual Aid agreements with surrounding communities for mutual aid emergency assistance.
8. Develop a list of structures/sites to be used as gathering sites in the event of an emergency situation.
9. Review and improve evacuation plans and file with Local Emergency Planning Committee (LEPC).
10. Install Automatic Vehicle Locators (AVL) in all emergency vehicles.
11. Purchase new generators to provide emergency power in times of need.
12. Unify the addressing system

ANALYSIS OF MITIGATION ACTIVITIES

Once the existing Hazard Mitigation Planning Committee had created the menu of potential future hazard mitigation activities, the activities were then analyzed. In addition, the Committee identified a time line for each activity, identified the responsible party(ies) for each activity and finally related each activity to at least one of the five Hazard Mitigation Plan Goals listed above.

Winter Storm Mitigation

Activity #1 Continue to enforce tree inspection and trimming program.

Analysis: The existing tree inspection and trimming program is a valuable asset to the community. The program serves to greatly reduce the number of limbs and branches that fall off of trees during thunderstorm events. This results in fewer power outages and less property damage. The City of Waverly intends to encourage Waverly Light and Power to continue its tree inspection and trimming program.

Timeline: Immediate/Ongoing

Responsible Party: Waverly Light and Power, Waverly Parks and Recreation

Related Hazard Mitigation Goal #: 2 and 3

Activity #2: Continue enforcement of snow ordinance.

Analysis: The Snow Ordinance is an element of the City's emergency response planning efforts. By utilizing their Snow Ordinance, a city is able to regulate parking patterns in the city, which allows the Public Works Department to respond to a snow emergency and clear the streets as quickly as possible.

Timeline: Ongoing

Responsible Party: Police Department

Related Hazard Mitigation Goal #: 2, 3, and 4

Activity #3 Purchase new generators to provide emergency power in times of need. (Portable power generation, power for fire and police, power for storm shelters)

Analysis: Currently, the city maintains generator as an emergency backup at the fire department and law center. In addition, the public works department has one portable generator for use in emergency situations. While the fire department and law center generators are adequate, the public works department's generator is not large enough to meet all its needs. The generator is large enough to power some lift stations, but not large enough to power the main lift station or water treatment plant. In addition, the communications center are city hall are currently without generators. Purchasing additional generators would better enable the city to address electricity needs in the event of a power failure.

Timeline: Long-term

Responsible Party: City Council

Related Hazard Mitigation Goal #: 2, 3, and 4

Thunderstorm/Hail/Lightning Mitigation

Activity #1 Continue to upgrade and install surge protectors on major electric lines.

Analysis: Power surge is an additional hazard often associated with thunderstorm events. Power surges can be the result of lightning strikes or power failures. This can be a hazard for residents individually and for the city as a whole, especially if communications are disabled. In addition, power surges that occur during thunderstorms can cause property damage to a variety of equipment and structures. By installing surge protectors on the major electrical lines, the city will be reducing the chance that a thunderstorm event could cause a power surge. The city utility, Waverly Light and Power has already installed a number of surge protectors on its major lines. Continuation of this is program would be a beneficial mitigation technique.

Timeline: Ongoing

Responsible Party: Waverly Light and Power

Related Hazard Mitigation Goal #: 2 and 3

- Activity #2** **Work with local utility to develop a program for the burying of existing utility lines.**
- Analysis: One of the hazards associated with thunderstorm events is the loss of electrical power. This can be a hazard for residents individually and for the city as a whole, especially if communications are disabled. By burying existing power lines, the city will be reducing the chance that a thunderstorm event could cause a power failure. The City of Waverly will work with Waverly Light and Power regarding the burying of utility lines.
- Timeline: Long-term
- Responsible Party: City Council, Waverly Light and Power
- Related Hazard Mitigation Goal #: 2, 3, and 4
- Activity #3** **Continue to enforce tree inspection and trimming program.**
- Analysis: The existing tree inspection and trimming program is a valuable asset to the community. The program serves to greatly reduce the number of limbs and branches that fall off of trees during thunderstorm events. This results in fewer power outages and less property damage. The City of Waverly intends to encourage Waverly Light and Power to continue its tree inspection and trimming program.
- Timeline: Ongoing
- Responsible Party: Waverly Light and Power, Waverly Parks and Recreation
- Related Hazard Mitigation Goal #: 2 and 3
- Activity #4** **Systematically review, make necessary improvements to, and enforce building code requirements.**
- Analysis: Building codes are constantly changing. Therefore, in order to provide minimum standards for the protection of life, limb, property, environment, and for the safety and welfare of the general public, building codes should be occasionally updated. This will allow the codes to reflect the safest known construction methods without restricting growth.
- Timeline: Ongoing
- Responsible Party: City Council, Building Inspector
- Related Hazard Mitigation Goal #: 2 and 3
- Activity #5** **Develop a NOAA Weather Radio awareness program.**
- Analysis: Although not exclusively for protection from Tornado or High Wind events, the NOAA Weather Radio provides an excellent source of information regarding up to date weather related events. Awareness of this resource should be considered a priority in order to allow citizens to be well informed and therefore able to take appropriate shelter in advance of storm conditions.
- Timeline: Long-term
- Responsible Party: County EMA
- Related Hazard Mitigation Goal #: 2 and 3
- Activity #6: Continue to utilize and develop the Code Red System**
- Analysis: Code Red is one more effective method to notify people in the event of a hazard. To often citizens do not have access to media, which results in information gap. Code Red fills this gap by contacting home phones and even cell phones of citizens in the community. In the event of a thunderstorm with frequent power and no access traditional media access (t.v., radio) citizens can still get information through cell phones.
- Timeline: Ongoing
- Responsible Party: County EMA, Police Department, City Council
- Related Hazard Mitigation Goal #: 2, 4, and 5
- Activity #7: Continue to recruit volunteer 1st responders (market opportunities)**
- Analysis: Volunteer first responders provide many benefits to the community including civic engagement and public service. Volunteer positions also aid the city financially. Volunteer positions might otherwise have to be filled with paid staff. In many situations without volunteers there may be no position at all, especially if the city is unable to afford additional staff.
- Timeline: Long-term
- Responsible Party: Police Department, County EMA

Related Hazard Mitigation Goal #: 2, 4, and 5

Tornado/High Wind Event Mitigation

Activity #1: Improve public awareness of proper steps to be taken in the event of a possible tornado.

Analysis: This alternative is currently taking shape in the form of frequent public service announcements on local radio and television stations. The development and/or continuation of a youth tornado awareness program should be considered in order to educate the youth of Waverly. Flyers and mailers are often used to get relevant information to the public at large in addition to local media outlets.

Timeline: Immediate

Responsible Party: Bremer County Emergency Management

Related Hazard Mitigation Goal #: 2 and 3

Activity #2: Develop a "Tornado Safe Room" awareness program.

Analysis: Tornado Safe Rooms are stand alone or rooms built into structures, generally in the basement, underground, or on the lowest level, that provide very effective protection against a tornado. Tornado safe rooms are quickly being recognized as the most attractive option for providing safe retreats in public, private, residential structures in times of tornados or extreme high wind events.

Citizens should be made aware of the risks associated with tornados and the steps that they can take to reduce these risks.

Timeline: Long-term

Responsible Party: City Council, Bremer County Emergency Management (EMA)

Related Hazard Mitigation Goal #: 2 and 3

Activity #3: Work with local utility to develop a program for the burying of existing utility lines.

Analysis: One of the hazards associated with tornado/high wind events is the loss of electrical power. This can be a hazard for residents individually and for the city as a whole, especially if communications are disabled. By burying existing power lines, the city will be reducing the chance that a thunderstorm event could cause a power failure.

The City of Waverly intends to contact Waverly Light and Power regarding the burying of utility lines.

Timeline: Long-term

Responsible Party: City Council, Waverly Light and Power

Related Hazard Mitigation Goal #: 2, 3, and 4

Activity #4: Systematically review, make necessary improvements to, and enforce building code requirements.

Analysis: Building codes are constantly changing. Therefore, in order to provide minimum standards for the protection of life, limb, property, environment, and for the safety and welfare of the general public, building codes should be occasionally updated. This will allow the codes to reflect the safest known construction methods without restricting growth.

Timeline: Ongoing

Responsible Party: City Council, Building Inspector

Related Hazard Mitigation Goal #: 2 and 3

Activity #5: Continue to enforce tree inspection and trimming program.

Analysis: The existing tree inspection and trimming program is a valuable asset to the community. The program serves to greatly reduce the number of limbs and branches that fall off of trees during thunderstorm events. This results in fewer power outages and less property damage.

The City of Waverly intends to encourage Waverly Light and Power to continue its tree inspection and trimming program.

Timeline: Ongoing

Responsible Party: Waverly Light and Power, Waverly Parks and Recreation

Related Hazard Mitigation Goal #: 2 and 3