HAZARD MITIGATION PLAN

Madison County, Illinois

June, 2006

Madison County Hazard Mitigation Plan

A Multi-jurisdiction plan prepared for Madison County, IL
and municipal partners:

City of Alton
City of Edwardsville
City of Granite City
City of Troy
City of Venice
City of Wood River
Village of Bethalto
Village of East Alton
Village of Glen Carbon
Village of Godfrey
City of Highland
Village of Livingston
Village of Pontoon Beach
Village of Marine
Village of Maryville
Village of Roxana

January, 2006

This plan was prepared by the Madison County Planning and Development Department in coordination with the Madison County Emergency Management Department. Representatives of the Hazard Mitigation Planning Steering Committee collaborated in the development of this plan.

Madison County Hazard Mitigation Plan

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1. Purpose of the Hazard Mitigation Plan

Purpose of Hazard Mitigation Plan:

A natural hazard event may strike at any time and has the potential to cause enormous loss of life and property. Although a community cannot predict when and where a hazard event will occur, it can plan for ways to reduce both structural and nonstructural damage. This planning is called local hazard mitigation planning and can result in a savings of life, property, natural resources, and financial assets for a community.

In recent years, there has been an increased public awareness regarding the dramatic affects natural and man-made hazards may have on a community. The 2001 terrorism attacks, the devastating Tsunami in Asia, and the aftermath of Hurricane Katrina all have brought to light the need for communities to be prepared for hazards. While much media attention is focused on the response to such hazards, public officials are actively engaged, on an ongoing basis, in emergency response planning for such events. Much of this planning relates to the coordination of resources when a hazard hits. An essential part of it, however, is public education and what the purpose of this report relates to, hazard mitigation. Mitigation before a hazard occurs reduces the lost of life and property.

This hazard mitigation plan assesses the ongoing mitigation activities in Madison County, evaluates additional mitigation measures that should be undertaken, and outlines a strategy for implementation of mitigation projects.

Madison County and participating municipalities have recognized the importance of hazard mitigation planning. Locally, units of government expended significant resources dealing with the impacts of past hazard events. These are the same units of government who now have the capability to establish policies and plans that can directly affect reducing risks and minimizing damage from hazards.

A dilemma that have faced governmental agencies is that they have responded in a coordinated way to natural and manmade hazard events by providing the necessary resources both during the immediate aftermath and later reconstruction of communities. In many cases, unfortunately, these efforts are repeated when similar hazards again occur. The government agencies expend vast financial resources only to find their selves in a cycle of hazard – repair – and hazard again. Federal and state agencies have taken a lead role in rebuilding communities but are increasingly asking for accountability and cooperation at the local level.

The Disaster Mitigation Act of 2000 was passed by Congress to encourage local governments to engage in active planning to minimize the risk, and the damage associated with hazards. It sets forth requirements that are tied to the availability of funding to address various mitigation measures. If a community does not engage in this planning, it is not eligible for financial assistance for either pre-disaster planning or post disaster mitigation.

This plan was developed in accordance with the requirements of the Disaster Mitigation Act. The Act requires that after November 1, 2004, a local government must have a mitigation plan approved in order to receive federal mitigation funding.

The plan is intended to reduce the threat to assets as the result of a hazard event. In this plan, assets are considered both property and people. The plan carefully analyzes the physical, social, and economical characteristics of Madison County and determines potential risks associated with natural and man-made hazards. As part of the analysis, these risks are stated and evaluated based on their potential impact on the assets.

A mitigation strategy is developed based on the analysis of risk factors and goals. The goals are established as broad policy statements consistent with sound community needs and practices. Objectives are established to further guide the actions set forth in this plan. Recommendations are made to provide specific guidance to units of government. The recommendations are key action items that will help address the need to minimize risk and damage from hazard events.

It is noted that these recommendations are intended to be carried out by both municipal units of government and Madison County government, subject to authorizations from their respective boards, as well as funding availability.

The Madison County Plan is a multi-jurisdictional plan. The following municipalities participated in the development of this plan: City of Alton, City of Granite City, City of Troy, Village of Bethalto, Village of Livingston, Village of Glen Carbon, City of Highland, Village of Godfrey, City of Venice, Village of Marine, Village of Maryville, City of Edwardsville, City of Wood River, Village of East Alton, Village of Roxana, and Village of Pontoon Beach. The respective units of government for each municipality are responsible for its adoption and implementation. A copy of the governing body's adopting resolution may be found as Attachment "A."

The Madison County Hazard Mitigation Plan will be reviewed periodically to determine the need for updates and to assess the success of its implementation. This evaluation is critical to assure that the plan is up to date and assess whether the recommended measures are being followed.

The cumulative effect of implementing recommendations in the plan will provide a reduction in the risk associated with the various different hazards. The goal, as before, is reducing the risk to people and property both in economic terms, as well as protecting the safety of residents of Madison County.

2. Planning Process and Public Participation

Planning Process and Public Participation:

Madison County has developed the Hazard Mitigation Plan in accordance with the Disaster Mitigation Act. A number of local government agencies and citizens participated in the various aspects of the Hazard Mitigation Plan formulation.

In any planning effort, it is important to involve constituencies that not only may provide important input into the development of the plan, but who may be affected by the outcome. The public participation effort, outlined in this section includes involvement with these key stakeholders.

This section further describes in detail the planning process and lists the local jurisdictions and organizations that participated. An organizational structure, that was used to complete the plan, is outlined.

The planning process included the development of goals and objectives at the outset, the identification of hazards, profiling past hazard events, the assessment of risks, and the development of a mitigation strategy.

The Federal Emergency Management Agency provided guidance on the process and elements that must be addressed in this planning effort. This plan process and its content address this guidance. The plan will be evaluated by FEMA to assure it complies with their criteria for comprehensive mitigation planning.

The following goals and objectives have been developed to guide the plan:

Hazard Mitigation Planning Goals & Objectives

Hazard Mitigation Plan Goal:
Reduce loss of life and property, human suffering, economic disruption and disaster assistance costs resulting from natural and man-made hazards.

Hazard Mitigation Planning Objectives:

- Form effective community-based partnerships for hazard mitigation purposes;
- Implement effective hazard mitigation measures that reduce the potential damage from natural and man-made disasters;
- Ensure continued functionality of critical services;
- Leverage additional non-Federal resources in meeting natural disaster resistance goals;
- Make commitments to long-term hazard mitigation efforts with establishment of a plan maintenance process.

Plan Participants and Process

The planning process followed, for the formulation of the Hazard Mitigation Plan, conforms to criteria established by the Federal Emergency Management Agency for Hazard Mitigation Planning. County staff developed the plan in-house with the assistance of public participants. The process, as outlined below, included the involvement of citizens, public entities, and businesses. These entities participated in the formulation of the plan, particularly the risk assessment, goal and objective review, goal and objective selection, and recommendations. The public participants were given the opportunity to comment on the plan during the drafting stage and prior to plan approval. Neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests were also invited to participate in the planning process.

Planning staff during the last six months of 2004 performed much of the data collection, background information, and analysis. The public participation process began during the summer of 2005. A public hearing was held on June 21, 2005 soliciting input on natural hazards Madison County is vulnerable to and the risks associated with them. The

plan was then further developed based on input from the public hearing and with the assistance of the Steering Committee. A final draft plan was presented to the Steering Committee for review. It was then forwarded for public review and comment. A final public hearing was held on January 11, 2006 with written comments accepted until January 27, 2006. This public participation process followed that recommended by FEMA and included certain suggestions outlined in the Community Rating System program.

The plan will be submittal to FEMA for review and comment. The County Board and the participating municipalities will then be presented with the plan for formal adoption. The final plan includes modifications based on comments received during the public participation process and additional ones will be incorporated, if necessary, after the formal review by FEMA and IEMA.

The following represents the process and participants involved with the development of the Hazard Mitigation Plan:

Planning Process

Committee/ Organization	Roles Responsibilities	Membership
Madison County **Municipal Governments**	• Initiate, authorize and support the hazard mitigation planning process • Approve the final hazard mitigation plan	• County and Municipal Boards
Steering Committee	• Provide direction and guidance as needed • Mobilize resources from county and affiliated organizations • Direct the activities of the Planning Process	• County Staff (Joseph D. Parente, Jack Quigley) • Municipal Staff • Citizen Members
Planning Staff	• Provide technical support primarily for development of the preliminary draft and final draft plan • Coordinate community involvement with other units of government	• Joseph D. Parente, *AICP*, Planning and Development Administrator • Jack Quigley, Emergency Management Director

Municipal Participation	• Participate in public meetings, risk assessment, and the establishment of mitigation goals, objectives, and recommendations	Participants and jurisdictions represented: Kevin Limestall City of Highland David Bradford Village of Glen Carbon Timothy D. Spaulding City of Alton Terrence S. Baney City of Highland William Brown City of Troy John Nolte Village of Bethalto Richard Mersinger Village of Bethalto Jim Monaghan City of Granite City Dennis Scarsdale Village of Livingston Robert Pollett Village of Livingston Richard D. Farthing Village of Roxana Larry Ringering Village of East Alton Jeff Mills City of Edwardsville John Ervin City of Venice Steve Alexander City of Wood River John Molitor Village of Marine Glen Neal Village of Glen Carbon Robert Barthelemy Village of Pontoon Beach Greg DeGroot Godfrey Fire Protection District Rich Schardan Village of Maryville Kevin Flaugher Village of Maryville

IEMA, FEMA and Other concerned agencies	• Provide advice and/or expertise about the planning process • Clarify plan approval requirements • Represents public and private interests	Staff from each concerned agency Martha Kopper East West Gateway Council of Governments Paul McNamara, AICP Southwestern Illinois Regional Planning Agency
Public Participation	• Solicit participation and work directly with the public to adapt information from the preliminary hazard mitigation plan and develop the draft and final hazard mitigation plans • Prepare and distributed to the public a description of the public information activities to encourage input by the public • Solicit public comment at the beginning of the planning process – public hearing and written comments • Solicit participation by neighboring communities and regional and local agencies involved in hazard mitigation activities • Solicit participation by academia • Solicit written comments and recommendations from public organizations in Madison County • Conducted a public hearing and solicited written comments on the draft final plan.	• Municipal and township officials • Individual community members • Representatives from non municipal governments • Representatives from business organizations • Representatives of neighboring communities and counties involved in mitigation planning • Regional Planning representatives including the Southwestern Illinois Metropolitan Planning Agency and the East West Gateway Council of Governments

3. Madison County Background Commentary

Madison County Background Commentary

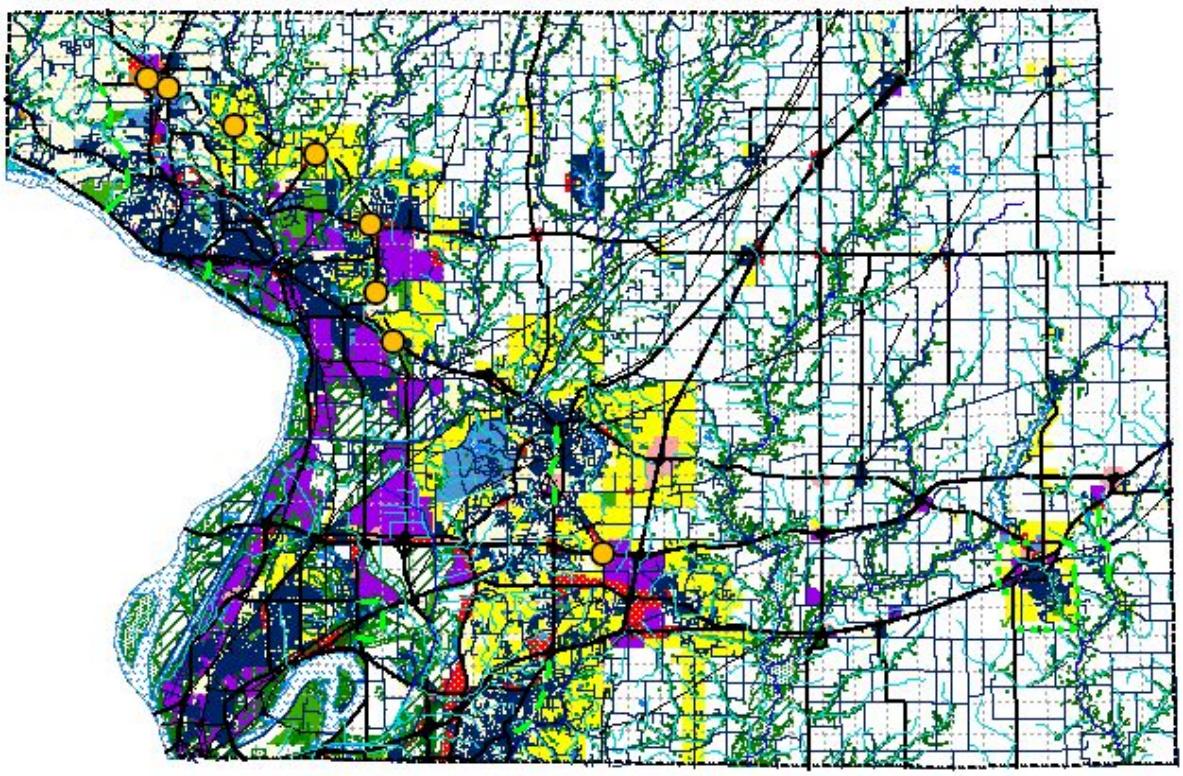
County Background:

Madison County is part of the Southwestern Illinois St. Louis Metropolitan Area. The county's population was 258,941 for the year 2000. Census projections by the East-West Gateway Council of Governments show that Southwestern Illinois is one of the fastest growing areas in Illinois. Collinsville, Edwardsville, Glen Carbon, Troy, and Maryville are experiencing the most rapid growth.

The largest municipalities are Granite City - 31,301; Alton – 30,496; Collinsville - 24,707; and Edwardsville, 21,491. Population and Housing statistics may be found in Attachments "L" and "M".

The development pattern of Madison County consists of a belt of industrial and densely populated municipalities along the western edge adjacent to the Mississippi River and a more rural, agricultural dominated, region to the east. The areas in the central portion of the County, beginning at the bluffs of the American Bottoms and moving easterly, have seen a high rate of residential growth over the past twenty years.

Madison County has an area of approximately 731 square miles. The western portion of the County is dominated by the American Bottoms. The American Bottoms is the flood plain of the Mississippi River protected against a 500-year flood by a federal levee system. Its Madison County portion is approximately 10 miles in width and fifteen miles in length. The Bottoms contain some of the richest farmlands in the State of Illinois. It also includes some of the most urbanized areas of the County. The Bottoms are flat and have land form features, which provide storm water drainage for both the Bottoms and areas in the uplands east of the bluffs. Horseshoe Lake and adjoining wetlands provide major drainage capacity for the watershed. In addition to flood storage benefits, many natural areas, such as wetlands, riparian areas, and other sensitive locations also provide beneficial nature for habitat, including that of rare or endangered species.

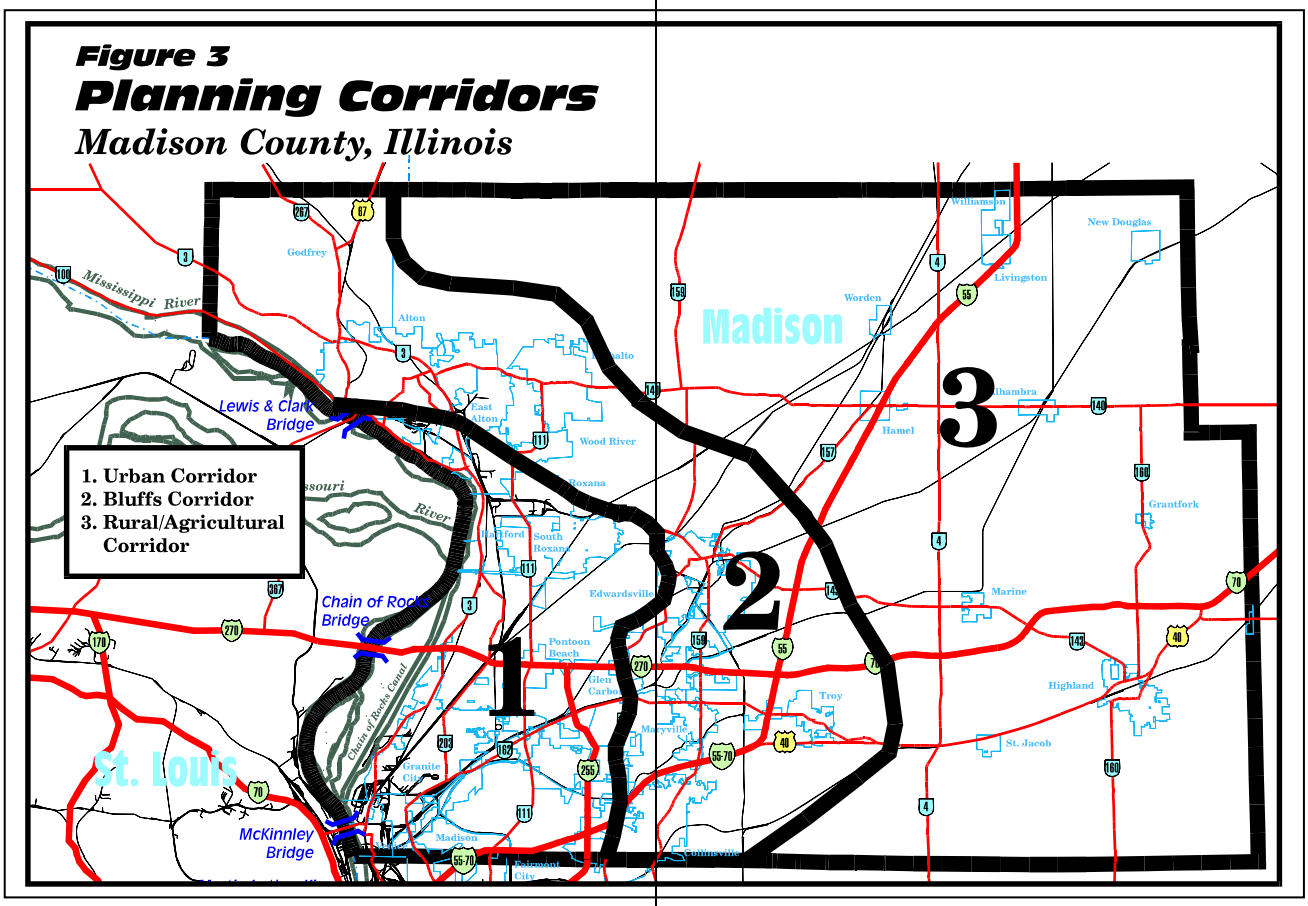


The bluffs rimming the eastern most part of the American Bottoms and extending along a line parallel to the course of the Mississippi River are probably the most distinct physical features in Madison County. They rise abruptly from the floodplain to heights of 200 feet near Alton.

Generally, thick, windblown loess deposits form cliffs that are dissected in places by small intermittent streams, which drain the upland areas immediately beyond and to the west.

The uplands or rural/agricultural area at the eastern portion of the county do not, for the most part, contain particularly predominant or unusual physical features. The terrain is gently to moderately rolling and is infrequently broken by small streams generally draining toward the American Bottoms.

In terms of future development patterns that may modify risks associated with hazards, most of the residential growth is occurring in regions that are not prone to bottom land flooding. Some of this development may be located on the fringe of major drainage features, but local floodplain regulations would prohibit development. Industrial growth is primarily occurring in the American Bottoms area, which is prone to flooding. Development standards requiring the elevation of structures and on-site storm water detention minimize this risk.



The population of Madison County is socially and economically diverse. While a large number of people commute across the Mississippi River for employment, large industrial employers in Madison County, such as Granite City Steel, Olin, and various refinery companies also attract employment from outside the County. Employment is dominated by manufacturing, service, retail, hospital and health services and education. The median family income, in 2000, was $41,541 in Madison County, compared with $44,417 for the entire St. Louis Region.

A major university, Southern Illinois University at Edwardsville, exists in the County. Lewis and Clark Community College and the Granite City campus of Southwestern Illinois College are also located in Madison County.

The area has excellent transportation facilities. Major rail lines crisscross the County in addition to three interstate highways and several Mississippi River barge ports. This transportation network supports the expansive industrial base that exists in Madison County. The network is deemed as an asset to the region and provides convenient access to many of the major markets in the central United States. The recent development of the Gateway Commerce center as a national distribution hub for the logistic related industries is principally

attributed to the transportation facilities that exist in the county.

This background information for Madison County was derived from a variety of sources. Primarily the information was obtained from past planning studies including the Madison County 2020 Land Use Plan and current demographic reports.

A listing of past studies, community plans and other background information on Madison County are provided in Attachment “B”. These studies provide additional background information on Madison County including long-range community plans and studies addressing specific planning issues.

Another important document is the Critical Facility Survey. The document was complied by the Illinois Emergency Management Agency and provides a comprehensive listing of all facilities in Madison County that are deemed to be critical to government officials in responding to hazard events. A sample of the in excess of 168-page report may be found in Attachment “N.”

A listing of some of the base maps from various studies may be found in Attachments “O -T.”

4. Risk Assessment

Risk Assessment

Hazard Identification

The first step in developing a hazard mitigation plan is to identify the hazards that potentially affect the planning area. It is these hazards that are prioritized for further analysis and eventual recommended actions. In this section, hazards are identified and reviewed both historically and in terms of relative risk and vulnerability.

There are many different types of hazards. Some are weather related while others are attributed to geological characteristics. Certain man-made hazards also exist in our community. The risk from each varies from one region of the country to another and in some cases from one locality to another. The frequency and magnitude from each hazard also vary by location. Identifying the types of hazards, and the level of risk, is an integral part of the mitigation planning process.

In assessing the risk in Madison County, each potential risk was screened and identified based on its frequency in this region, area of impact, magnitude/intensity, and consequences including the impact on people and property. This review was accomplished by a careful analysis of available information. The use of FEMA hazard identifying worksheets aided in this review. The state hazard mitigation plan and associated reports were also carefully examined in identifying hazards. A more detailed explanation of the approach used is explained later in this section.

Based on this assessment, the following hazards are recognized as potential areas of concern for Madison County. These hazards have an established historical presence in the community or are determined to have a high level of risk:

- Flooding
- Severe weather; including tornadoes and windstorms, winter storms, heat waves and droughts
- Earthquake
- Subsidence, Landslides and land failures (e.g., naturally occurring subsidence)
- Man-made caused hazards; including hazardous materials releases and spills, and terrorism.

During the hazard identification process, it was determined that some of the identified hazards pose little danger to the County because of a very low chance of occurrence. Others projected that effects would not be widespread in the community. Many, however, were determined to have a high probability and risk. These hazards have the potential for the loss of life or property and widespread damage. They have been selected to be included in further analysis as part of this risk assessment process.

There are also some hazards, particularly those caused by man, such as terrorism or aviation incidents, for which little can be done in advance to mitigate. While certainly critical, because of this, these hazards are not part of this more detailed risk assessment. Other hazards have data limitations that limit our ability to determine relative vulnerability. Although the final mitigation plan for Madison County will describe the nature of these hazards and the potential for occurrences, some will not have broad mitigation actions developed as part of this mitigation plan.

Since this is a multi-jurisdictional plan, it is noted that there exists some variation in risks based on the geographical location of a community. The varied risks of these locations will be discussed in later sections.

The detailed process followed for identifying hazards included the compilation of hazard data and the analysis of such information. Historical records were compiled and analyzed by professional staff members. This staff, which participated in FEMA's training for hazard mitigation planning, used FEMA's worksheets for identifying hazards and their risks in Madison County. Other information was obtained from existing studies, plans, and reports. This information was carefully reviewed and relevant

information was considered as part of the hazard risk assessment.

The Internet was used extensively for researching hazard maps and other available data. Local mapping was also used as part of this assessment. The County's Geographical Information System (GIS) was used to generate some of the mapping. A layered GIS map was developed that included locating structures in a flood hazard area, soils, topography, and additional structure characteristics, such as, age of house, type of construction, building values, etc. This mapping was useful in spatially demonstrating the location of areas vulnerable from various hazards. An exhibit showing this program can be found in Attachment "J".

Other information used in the review included the Madison County Soil Survey. This information was useful in determining geographical and geological characteristics of different areas.

The assessment also included an analysis of the financial impact and dollar loss from various hazards. Some data was available to make this assessment. Unfortunately, the lack of comprehensive data was an obstacle in providing reliable estimates. It is hoped that this data will become available in the future to provide better numbers that will be useful for hazard planning purposes.

At the end of the assessment, the results were presented to the Planning Steering Committee for approval. Subsequently, the findings were presented at the public participation meetings. After considering public comments, hazards were selected for formal inclusion in the Madison County Hazard Mitigation Plan.

Past Hazard Events

The following represents a review and analysis of past hazard events that will be utilized in determining the risk associated with the selected hazards. The study of past events is essential in determining the risk for future events. Historical data is a reliable source of information that can help determine an areas vulnerability to the different hazards. Each hazard will be analyzed based on the frequency of occurrences in the region. The nature of the damage and its extensiveness will allow for a more broad understanding of the risk that exists in the area from each hazard.

Flooding. Portions of Madison County have historically suffered from flooding. A large section of the County is found in an area known as the American Bottoms. Before the erection of federal levees in the 1940's, portions closest to the Mississippi River would seasonally flood. In times when historical river water levels would rise, more extreme flooding occurred. Since the area has been protected by federal levees, the historical record river levels have had less of an impact on the American Bottoms in Madison County. An area of downtown Alton, that is unprotected, flooded in 1973, 1993, and 1995. An urbanized area located on Chouteau Island also flooded during these events. After 1993, local floodplain regulations restricted the residents from rebuilding and a FEMA funded buyout subsequently relocated the residents out of the flood plain.

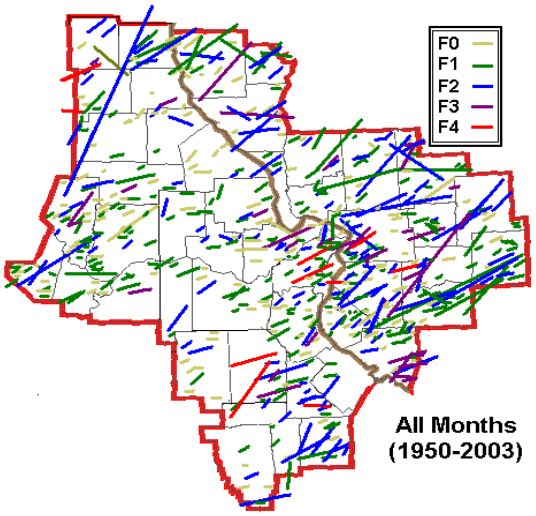
Portions of the American Bottoms suffer from interior flooding during periods of heavy rains. The vulnerable areas are generally low lying flatland areas without proper drainage facilities to provide for the runoff of storm water. Most of the dwellings located in flood hazard areas were constructed prior to modern zoning codes and flood plain ordinances. Several residential areas are notorious for this type of flooding includes Dobrey Slough, State Park Place, and other smaller settlements that are built in a flood zone or on its fringe. In addition, there are pockets of poorly drained soils in this region that are not suitable for building construction. Structures built in these areas are subject to high ground water, unstable soils including those prone to shrinking and swelling. These conditions can damage foundations and create basement flooding.

Major flooding events in the St. Louis Metropolitan region:

July 1947
July 1951
April..... 1973
August 1993
May 1995

Madison County has a number of repetitive loss structures as a result of previous flooding events. While some of these structures have been mitigated through structural changes,

buyouts, and demolitions, there remains a significant number that continue to be damaged by historical flooding events.



Historical Tornado Paths

Severe Weather. Madison County is located in a region of the country that is prone to severe weather from temperature, precipitation, and high winds. Past events causing major damage to property and people have occurred. Attachment D-G, located in the Appendix, provides a historical listing of these severe weather events, including tornados, over various periods of the last century. These listings are useful in assessing the frequency, and extent of these hazards.

Severe weather events, such as thunderstorms with damaging winds, hail, or lighting have been most frequent. Storms containing a tornado are less frequent but much more destructive causing extensive loss of property with a high risk for loss of life. As attachment "F" shows, tornados have historically been common in Madison County occurring several times each decade.

The region has also experienced severe ice and snowstorms. The area receives an average of sixteen inches of snowfall each year. Major storms deposit significant amounts of snow on top of structures potentially causing damage from the combined weight and wind force. Ice storms can have a damaging effect on utility lines and cause obstructions on property from fallen trees that hit utility lines and buildings. electric power networks could be damaged and experience a disruption in service. Buildings not constructed to modern building codes would have structural failure. An earthquake of this magnitude is of concern to local officials and

Recent Major heat wave conditions in St. Louis Metropolitan region:

Summer 2001
Summer 1999
Summer 1995
Summer 1989
June-August 1980
Winter Storm.....May 1994
Snow Storm.....January 1982

Extreme variations in temperature have created health hazards for persons with medical complications and those occupying residences with inadequate heating, cooling or ventilation. Historical records support the extreme variations that exist in the St. Louis metropolitan region.

Damage to resources, both people and property, are substantiated from records of historical severe weather events. While each hazard occurs to different extents annually, including when and where they are documented as being hazardous to this region.

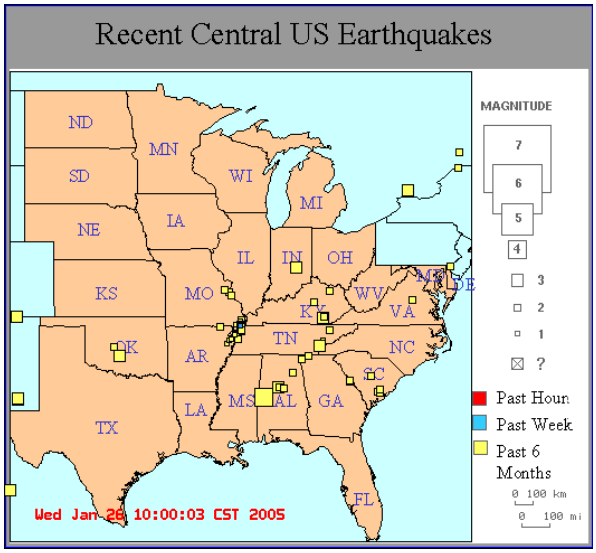
Earthquake. Madison County is located in the New Madrid Fault region. Since the region has urbanized over the past century, there has not been a major earthquake that has caused widespread damage. Several minor events over the years have caused moderate damage to structures.

Past earthquake events, if recorded today, would cause significant damage to structures. For example, the 1895 earthquake, estimated to be of the magnitude of 6.8, today would result in major damage. Damage could include numerous bridge failures over the County's watershed system. There could be fire and explosions from natural gas and petroleum pipeline ruptures. The disruption of utility services could occur. Facilities such as railroads, highways, telecommunications, and residents alike.

Major New Madrid earthquake events in St. Louis region:

December 16, 1811.....8.1 on Richter Scale
February 2, 1812……..8.0 on Richter Scale
January 23, 1812 .....7.8 on Richter Scale
January 4, 1843 .....6.0 on Richter Scale
October 31, 1895 .....6.8 on Richter Scale
August 21, 1905.....4.8 on Richter Scale

There is no way to predict when an earthquake



will occur. Likewise, there is no way to predict the magnitude of an event. Planners and public safety officials must rely on historical data as witness of the "potential" that a major earthquake may have for damage and stress property protection and emergency response.

Other Hazards. Other hazards have occurred from time to time in the Madison County region. Some of them pose little threat, although, their occurrence is certainly within the realm of possibility. For example, wild fires are infrequent and are typically controlled by local public safety personnel. The hazard has occurred in the past, however, and the region is prone to it, particularly during drought conditions. Other hazards exist in the region to different extents, backed by historical records documenting the occurrences.

There is some documentation of land failures either naturally or man made. Landslides are generally considered natural hazards although they may be created by actions by man. Constructing buildings in areas prone to landslides or removing vegetation creating erosion prone areas would be examples of hazards made worst by man. In Madison County, there have been isolated instances of landslides causing damage to structures. Most of these occurrences exist along the bluff line or along steep slopes adjacent to major drainage ways.

Another hazard that is deemed man made is mine subsidence. Mine subsidence may cause relative damage to structures built over active or abandoned mines. With the exception of limestone mining occurring in areas near Alton, most of the coalmines have been closed for decades. Although the mines are no longer active, subsidence activity is still prevalent in some areas of Madison County. The South-Central region including Collinsville, Maryville and Glen Carbon contains several closed mines. The area to the northeast, around Livingston, is also known for its past mining area. Local government resources do not maintain historical records of damage from mine subsidence. Residential development has occurred in the rapidly growing area of the South-Central portion of Madison County creating an increased risk that subsidence damage may occur to structures in these neighborhoods. When the damage has occurred, residents have been forced to invest in repairs and reinforcement of foundations to correct the problem and avoid further damage.

Another man made hazard, hazardous material releases, occurs on an infrequent basis. The potential always exists for a hazard material release, particularly because Madison County contains major interstate highways and railroad lines where hazardous materials are transported. There is a large industrial base where hazardous materials are either used in the manufacturing process or are a waste product. No historical record of past material releases or accidents could be compiled for this report although the information may be available from state and federal emergency resources. Like earthquakes, the potential for this hazard exists to a great enough level to acknowledge its importance.

Another man made hazard, terrorism, has recently become more recognizable as a result the 2001 attacks in the United States and oversees events since then. While there are limits of what can be done in terms of mitigation planning, it is a recognized hazard that belongs in any effort to address hazards and the protection of people and property. Local Emergency Management organizations have taken the lead in the planning, preparation, and response to terrorism. Coordination with state and federal agencies, such as the U.S. Department of Homeland Security, is occurring to assure local governments' preparedness to respond to an incident of terrorism. To date, there have been no records of local events related to terrorism.

Potential Hazards

As part of the risk assessment process, in addition to reviewing historical hazard records, a more detailed analysis is provided to assess the potential for the various types of hazards. This section addresses each hazard and provides information associated with the potential for each hazard and the impact it would have in Madison County.

Flood. Madison County is bounded on the west by one of the largest rivers in the world, the Mississippi River. Major streams in the county are the Cahokia Creek, Silver Creek, Wood River Creek, Piasa Creek, and Sugar Creek. They all drain to the Mississippi River, with the exception of the Silver and Sugar Creek, which, drain first to the Kaskaskia River.

The risk for damage to structures exists because of the significant land areas that are either in a flood hazard area, or are prone to interior flooding. Flooding occurs when an overflow or inundation comes from a river or other body of water causing a relatively high stream flow, overtopping the natural or artificial banks in any reach of a stream, or ponding in low lying areas. Riverine flooding includes headwater and backwater effects. Floods can be slow or fast rising, depending on the intensity of the rainstorms in the watershed over a certain length of time, or from rapid snowmelt or ice melt. Floods generally develop over a period of days. During heavy rains from storm systems (including severe thunderstorms), water flows down the watershed, collecting in, and then overtopping, valley streams and rivers.

Flash flooding is characterized by rapid accumulation or runoff of surface waters from any source. This type of flooding can occur within six hours of a rain event, after a dam or levee failure, or the sudden release of water held by an ice or debris dam. Because a flash flood can develop in just a matter of hours, it can catch people unprepared. Most flood-related deaths result from this type of flooding. Slow-moving thunderstorms or heavy rains cause most flash floods.

Land adjacent to all the major streams and their tributaries are subject to overflow. Flood hazard mapping is completed for Madison County and its municipalities. The mapping reflects, with an acceptable degree of accuracy, those areas in the County subject to flooding. An area of concentration is the area described as being in a base flood area, or 100-year flood plain. A map showing flood hazard areas is included in Attachment “P”.

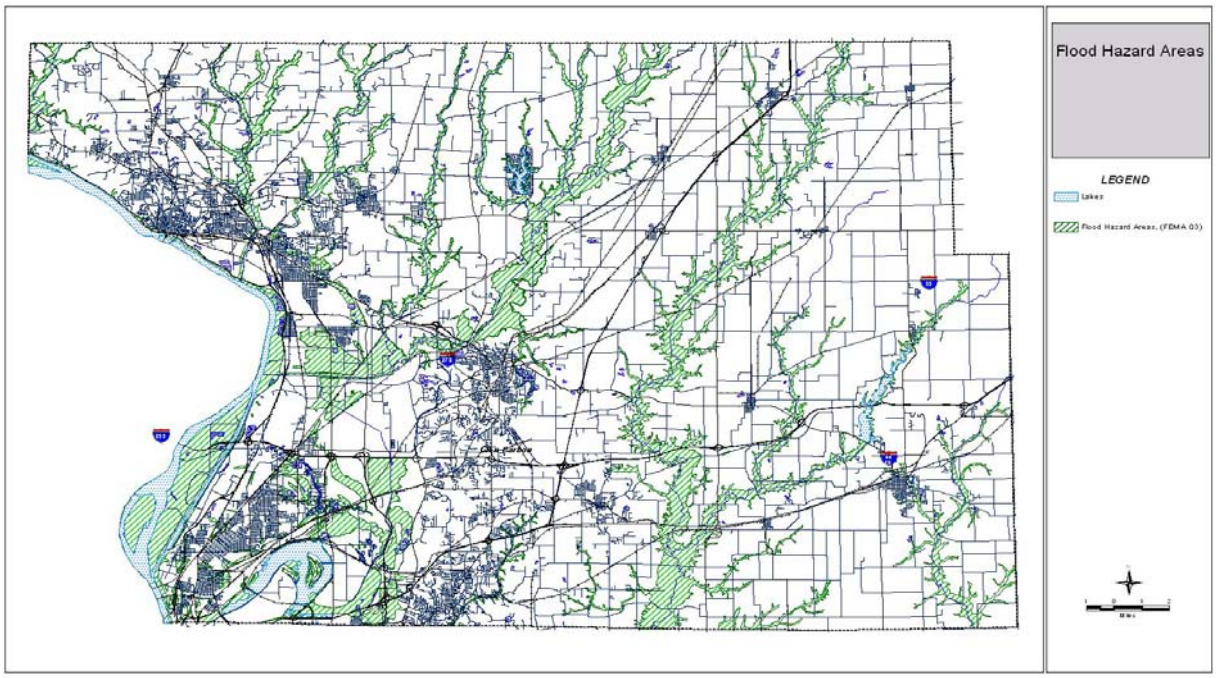
The term “base flood” or 100-year flood is the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year, based on historical records. A 500-year flood is defined as the area in the floodplain that has a .2% probability of occurring in any given year. While unlikely, it is possible to have two 100, or even 500-year, floods within a few years or months of each other. The primary use of these terms is for the determination of flood insurance rates in flood hazard areas. Using historic weather and hydrograph data, experts derive the estimated rate of flow or discharge of a river or creek. After extensive study and coordination with Federal and State agencies, this group recommended that the 1-percent-annual-chance flood (also referred to as the 100-year or “Base Flood”) be used as the standard for the NFIP.

The 1-percent-annual-chance flood was chosen on the basis that it provide a higher level of protection while not imposing overly stringent requirements or the burden of excessive costs on property owners. The 1-percent-annual-chance flood (or 100-year flood) represents a magnitude and frequency that has a statistical probability of being equaled or exceeded in any given year, or the 100-year flood has a 26 percent (or 1 in 4) chance of occurring over the life of a 30-year mortgage.

The floodplain of the Mississippi River is of special concern to Madison County. The Mississippi River floodplain portion of the area is located in a multi-county physical region known as the American Bottoms. The American Bottoms floodplain has been manipulated since the 1850's to enhance its value to produce agricultural crops and support residential, industrial, commercial, and transportation development. There are several levels of flood protection in the Madison County portion of the American Bottoms. Immediately adjacent to the Mississippi River, a small portion of the land is unprotected or virtually unprotected by any levee system. Small private levees are sometimes used to enhance crop production or protect industrial land from very frequent floods. Chouteau Island is protected from flooding to a 20-year level of protection. Approximately 70,000 acres of the American Bottoms are protected from the Mississippi River to the 500-year level by Federal Levees constructed under the supervision of the U.S. Army Corps of Engineers. The Corps of Engineers, the Metro-East Sanitary District, and the Wood River Drainage and Levee District maintain these levees. Within the boundaries of the 500 year levees are many areas with imperfect drainage systems where flooding is common. The areas along the eastern side of the American Bottoms have flooding problems that are complicated by runoff from upland urban development and a system that was designed to provide drainage for agricultural production.

Flooding of residential property and urban infrastructure occurs in scattered areas throughout the American Bottoms. Residents in the Dobrey Slough area have had problems with flooded streets and basements when moderate rains of 2 to 3 inches occur. This is primarily due to its location in a low-lying area and poorly drained soils. Basement flooding, including the possibility of foundation damage, is possible from high ground water during seasonal periods or when the river level is high. While problems associated with ground water continue to be an issue, recent surface water improvements in the watershed have alleviated some flooding.

Other residential areas where flooding may occur include homes adjacent to Long Lake, the Sand Road area south of Interstate 270, portions of the State Park neighborhood, and other small areas in the Granite City, Madison, and Venice areas. These areas may flood during heavy rains although recent drainage improvements have alleviated some of the risk.



Flooding of streets and roads mostly in the American Bottoms area causes transportation disruptions. Flooded streets make evacuations difficult and increase wear on vehicles.

An inventory of assets was completed as part of this plan. The worksheet is provided in Attachment "K". The inventory was conducted by utilizing an analytic tool in the county's Geographical Information System that calculated the count and value of structures located on lots that is partially or wholly located in a flood hazard area. Please note that some of these structures may not actually be located in a flood hazard area but are listed because part of the tract of land, in which they are located, is. This represents the best data available for the risk assessment. Resources do not exist at this time to perform a more detailed inventory and analysis although this may be one of the future actions recommended in this plan.

The inventory indicates that of the 194,374 structures in Madison County, 4,128 of them are located in the flood hazard area. The value of all structures in Madison County is in excess of ten billion dollars. The value of structures located in the flood hazard area is in excess of two hundred and thirteen million dollars. This information was derived by using the Madison County Geographical Information System and calculating the value of property, as determined by the Assessor, against properties located in the flood zone.

It is difficult to estimate the losses that may result from a flood event. Losses may vary based on the location of the structures and their elevations. For example, a structure located several feet below the base flood elevation will experience losses that are more extensive during a flood event than one located at the base flood elevation. This is due to a higher water level in the structure and potential hydrostatic pressure on the building. To a lesser extent, losses may occur from high flow velocities of flooding.

In Madison County, predominant flooding patters will be the result of interior flooding of low-lying areas that lack adequate flooding facilities. In these areas, as mentioned above, damage will occur based on the depth of the flood as determined by the 100 year flood depth and the actual elevation of the structure. More study is required to ascertain damage estimates for these existing structures.

There are also critical facilities that are located in areas subject to flooding hazards. Critical facilities are defined as a structure, operated by either the public or private sector, that provides essential products or services to the general public, is otherwise necessary to preserve the welfare and quality of life in the county, or fulfills important public safety, emergency response, and/or disaster recovery functions.

Other types of flooding that may occur includes that which is a result of interior drainage canals or flooding of low-lying areas. Both of these types of flooding are normally the result of heavy periods of rainfall during short durations. High Mississippi River levels may also contribute to the failure of interior levee systems since the ability of the canals, streams, and other channels have a reduced ability to properly drain.

As mentioned previously, high river levels also affect groundwater levels that approach the surface in some areas. In these locations, drainage facilities are impacted as well as structures with basements. Building foundations may be damaged from hydrostatic pressure from the ground water and basement flooding can occur.

This detailed analysis demonstrated the risks that exist in Madison County from flooding. This hazard has the potential to occur on a frequent basis and as long as structures and other assets exist in areas vulnerable to flooding, damages may occur on a repeated basis during these events.

Severe Weather. Madison County is located in a region of the country that is prone to severe weather from temperature, rainfall, and high winds. The risk for damage from severe weather is high. The probability for recurring damage is likely. There is no way to prevent severe weather from occurring or predicting where it will hit. Minimizing damage from severe weather, however, is a viable objective in mitigation planning. Assessing the level of risk is an important part of the planning that is necessary in protecting resources.

The County lies within Illinois' West-Southwest climatological region and has continental climate with marked seasonal shifts in temperature. Summers are warm and humid, spring and autumn are mild, and winters are cold with snowfall accumulations. Average annual temperatures are 55° F. Temperatures in January range from an average low of 19° F to a

high of 36° F and in July from an average low of 69° F to an average high of 89° F. Annual precipitation averages 36 inches with a mean relative humidity of 82 percent at 6:00 a.m. and 64 percent at 6:00 p.m. Mean annual snowfall is 16 inches.

High wind events are a major threat to property and people, including critical facilities. Madison County is located in a relatively high-risk area for tornados. A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornados are capable of tremendous destruction with wind speeds up to 250 miles per hour or more. Damage paths can be in excess of one mile wide and fifty miles long. Tornados are among the most unpredictable of weather phenomena.

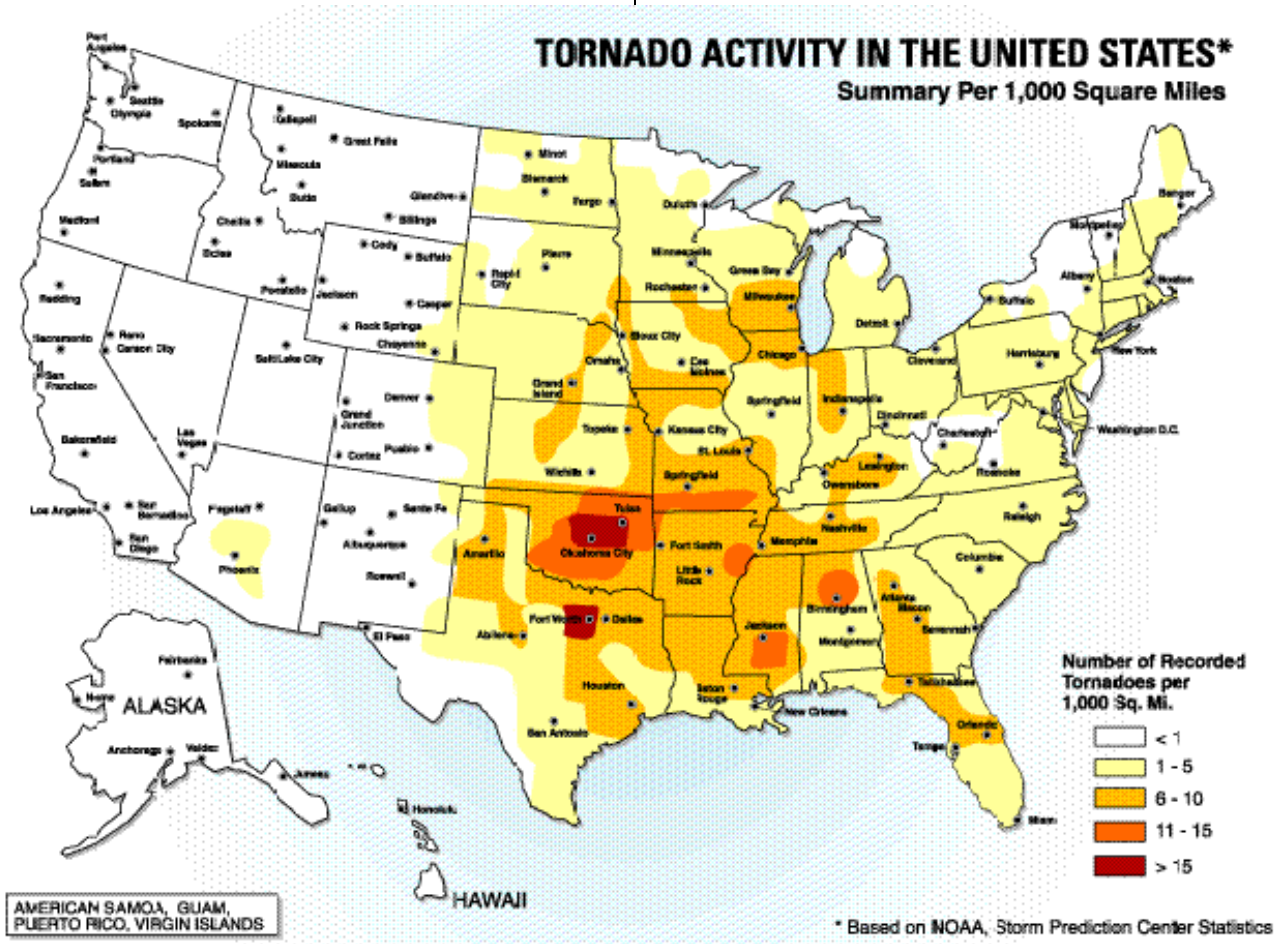


Figure I.1 The number of tornadoes recorded per 1,000 square miles

Tornado season runs ordinarily from March through August, however, tornados can strike any time of the year depending whether or not essential conditions are present.

Other storm events, such as thunderstorms with damaging winds, hail, or lighting also pose a risk. These storms are more frequent than those containing a tornado but are typically less destructive than the violent tornado event. FEMA describes a thunderstorm as being formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front. Thunderstorms may contain lightning and winds and can occur singly, in clusters, or in lines. Because of this, it is possible for several thunderstorms to affect one location in the course of a few hours. FEMA contends that some of the most severe weather occurs when a single thunderstorm affects one location for an extended time.

Hailstones are balls of ice that grow as they are held up by winds, known as updrafts that blow upward in thunderstorms. These updrafts carry droplets of water at a below freezing temperature that are not yet ice. The water droplets hit the balls of ice and freeze instantly, making the hailstones grow larger. The faster the updraft, the bigger the stones can grow. Typically, hailstones are smaller in diameter than a dime, but stones weighing more than a

pound have been recorded. When they fall, they damage property. The most prevalent damage occurs to vehicles and roofs.

The region is also prone to ice and snowstorms that can be severe. Winter storms may be caused by various elements such as heavy snow, sleet, or ice accumulation from freezing rain. Storms vary in size and intensity and may be accompanied by strong winds that create blizzard conditions and dangerous wind chills. There are three types of winter storms: a blizzard, heavy snowstorms and ice storms. A blizzard may be considered the most dangerous winter storm because it combines low temperatures, heavy snowfall and winds above thirty-five miles per hour. Heavy snowstorms are those that drop four or more inches of snow within a twelve-hour period. Ice storms may also be dangerous because the moisture that falls freezes upon impact causing dangerous conditions for transportation. Major storms deposit significant amounts of snow on structures damaging them from the weight of the snow. Ice storms also have a damaging effect on utility lines and cause obstructions of property from fallen trees that hit utility lines and buildings.

Another severe weather hazard is extreme variations in temperature. Temperature fluctuations can create health hazards for persons with medical conditions and those occupying residences with inadequate heating, cooling or ventilation.

Critical facilities are also prone to risks from severe weather. A survey has been completed listing the location of critical facilities and limited building data. Other data collection is needed to assess the potential damage that may occur. The plotting of critical facilities in the Madison County GIS system coupled with the development of the HAZUS program will enhance our ability to assess this risk.

It is difficult to assess the dollar loss from a weather related event due to data limitations. Madison County has structures valued at over ten billion dollars. Some weather related events might cause widespread damage while others are more localized, such as the path of a tornado. In the case of a severe storm such as a tornado, damage may be in the millions of dollars. Resources do not exist at this time to perform a more detailed inventory and analysis although this may be one of the future actions recommended in this plan. While it was not part of this planning effort, the use of the HAZUS program may be valuable in making projections of losses from different hazard scenarios.

Based on this assessment of risks associated with weather related hazards, it is clear that Madison County processes significant risks associated with them. The region is prone to extremes in most weather conditions and the vulnerability from each risk is clearly substantiated.

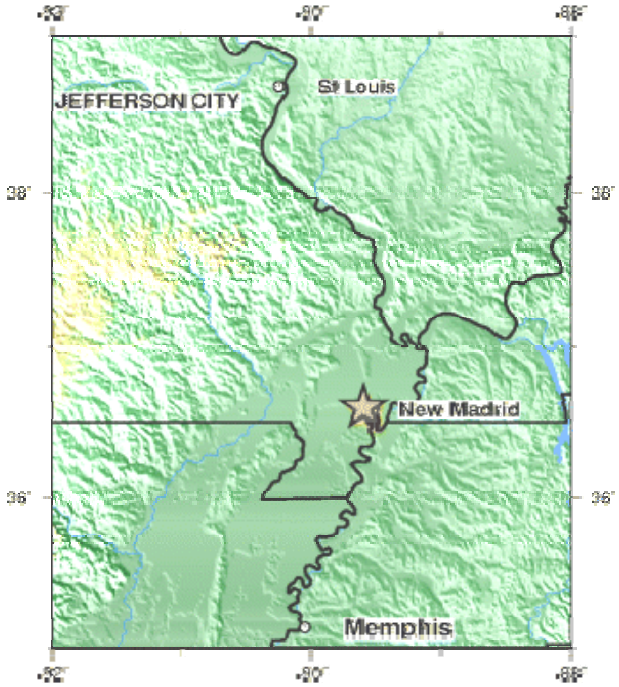
Earthquake. Because of Madison County's location in the New Madrid Fault region, the likelihood of a major earthquake in the future is high. According to the FEMA web site, an earthquake is "a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface." Earthquakes can be one of the most damaging hazards because the shaking of the ground may cause buildings and bridges to collapse; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, and fires. Earthquakes also may damage buildings, particularly those not built to current building codes. Those buildings or structures that are not tied down to a reinforced foundation anchored to the ground are at greater risk since they can be shaken off of their mountings during an earthquake. Earthquakes are also dangerous because they can occur at any time and because there are no proven warning signs of an earthquake.

The New Madrid Seismic Zone, which impacts at least a 29 county area in Southern Illinois, is the most active fault zone east of the Rocky Mountains and has an extensive history of earthquakes, including some of the largest ever recorded. In addition, numerous counties in six surrounding states are also within this earthquake zone and are susceptible to major damage. Madison County is within this zone.

The common earthquake measurement is referred to as the Peak Ground Acceleration (PGA). The PGA is a measurement of the strength of ground movement. The PGA considers the combination of the geographical area affected by an earthquake, the probability of an earthquake of each given level of severity (10% chance in 50 years), and the severity. Madison County falls in a range of .20 to .15

PGA. Attachments "H" and "I" show PGA levels and risk ratings for the United States.

Portions of the American Bottoms area of Madison County is composed of soils vulnerable to an effect referred to as liquidfication. In an earthquake, the movement of the ground in some locations may be greater, thus potentially causing more extensive damage to a structure. Experts have estimated that enough energy has been stored to produce another earthquake of at least 6.0 to 7.0 magnitudes along the New



New Madrid, Missouri

Madrid Fault (1895 in Charleston, Missouri was the last major occurrence of a 6.8 magnitude earthquake).

There is also a probability of a larger than 7.0 magnitude earthquake to occur. Earthquakes of this magnitude could be felt across the United States with major direct damage in at least seven states surrounding the New Madrid Seismic Zone. There is a significant need to increase the public's awareness and preparedness for the possibility of such an event in order to reduce the casualties, injuries, and damages, which would result. In the event of a major, damaging earthquake, there could be numerous bridge failures over the County's water shed system. Fire and explosions from natural gas and petroleum pipeline ruptures, would increase damage, in addition to disrupting utility services.

Railroads, highways, telecommunications, and electric power networks can be expected to receive damage and disruption. Buildings would also suffer significant damage, particularly those not built to higher earthquake building codes.

Like the other hazards, it is difficult to assess the dollar loss from an earthquake. Madison County has structures valued at over ten billion dollars. It also has many older masonry structures that were built prior to modern building codes. These structures are most vulnerable to damage from an earthquake. Depending on the magnitude of the earthquake, damage may be widespread or localized to the most vulnerable structures. While data limitations prevented a more detailed inventory of assets, Attachment "K" does provide some base information. Resources do not exist at this time to perform a more detailed inventory and analysis although this may be one of the future actions recommended in this plan.

A significant risk also exists for critical facilities. Many of the critical facilities may sustain damage from an earthquake. While a listing of critical facilities has been developed, the lack of data such as building age, construction type etc., limits the ability to assess the level of risk of such facilities.

Other Hazards. Other hazards exist in the Madison County region. Some of them pose little threat although their occurrence is certainly within the realm of possibility. For example, wild fires are infrequent and are typically controlled in this region by local public safety personnel.

Some hazards exist in certain portions of the County based on physical landforms or geological characteristics of the area. Landslides are possible in areas where steep slopes exist. These areas can be disturbed by development activities and if proper construction techniques are not followed, can cause significant damage to structures.

Another hazard is mine subsidence, which is found in certain areas of Madison County that have mineral deposits beneath the surface and had active mining years ago. Mine subsidence may cause substantial damage to structures built over active or abandoned mines. With the exception of limestone mining occurring in areas near Alton, most of the coalmines from the past have been closed for decades. Although the mines are no longer active, subsidence activity

is still prevalent in some areas that have been undermined. Structures built over undermined areas are prone to subsidence. Subsidence can cause foundation and structural damage. Common problems include cracks in foundations, walls, and ceilings. In some cases, buckling of floors and roof structures are apparent. Because subsidence activity sometimes occurs over long durations of time, owners of structures must wait for years until the subsidence stops before making permanent repairs.

Damage from subsidence may be localized or widespread in an area. It is not uncommon for a limited number of structures in an area to have damage while others are not impacted. Dollar losses could vary from the thousands of dollars to tens of thousand dollars, depending on the type and value of structure. In urbanized areas where several structures are subject to the same subsidence location, this number will multiply.

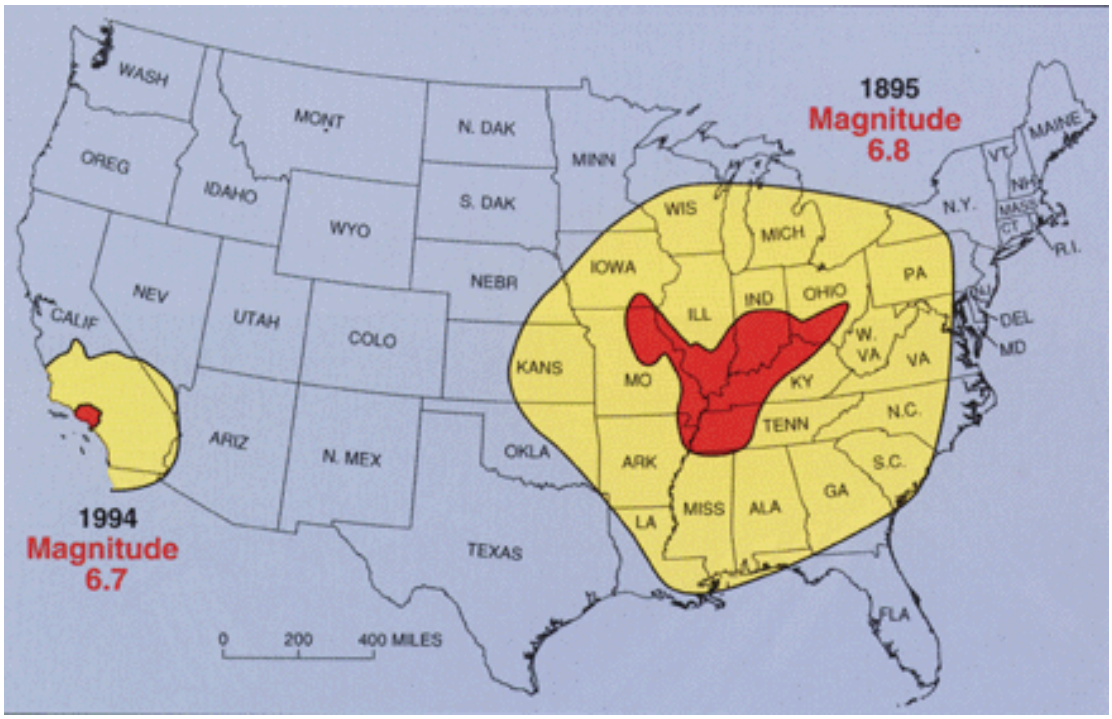
While data limitations prevented a more detailed inventory of assets, Attachment “K” does provide some base information. Resources do not exist at this time to perform a more detailed inventory and analysis although this may be one of the future actions recommended in this plan.

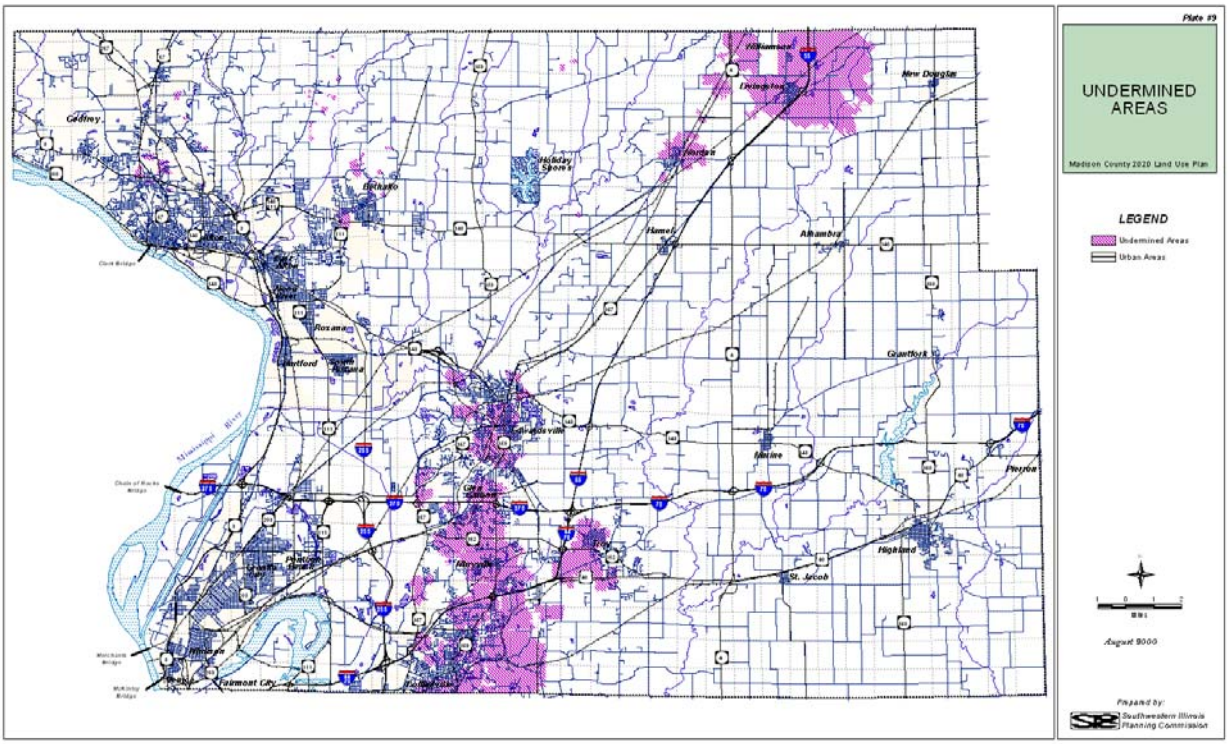
Another man made hazard, hazardous material releases, occur on a more infrequent basis. The potential always exists for a hazard material release, particularly given the fact that Madison County contains major interstate highways and railroad lines where hazardous materials are transported, and a large industrial base where hazardous materials are either used in the manufacturing process or are a waste product. Emergency Response representatives communicate with hazardous material handlers on a regular basis as part of their efforts of determining the level of risk and to assure measures are taken to minimize it.

A last man made hazard, terrorism, has recently become more recognizable as a result the 2001 attacks in the United States and subsequent attacks abroad. While there are limits of what may be done in terms of mitigation planning, it is a recognized hazard that belongs in any effort to address the protection of people and property. As the field of study evolves, it is anticipated that this will become active in terms of mitigation planning.

The risk from other hazards, particularly those that are man made like mine subsidence, are prevalent in Madison County. These risks, like those associated with flooding, weather, and earthquakes are recognizable hazards that must be addressed as part of a hazard mitigation planning effort.

OTHER REFERENCE MAPS – EARTHQUAKE HAZARD AND UNDERMINING HAZARD





Hazard Risk Assessment Chart

Based on the review of historical events associated with the identified hazards, and the assessment of the potential for damage to resources from each type of hazard, the following chart summarizes the risks identified in the hazard assessment, their probability of occurrences, and the relative consequences.

Probability → Consequences ↓	5 Frequent	4 Likely	3 Occasional	2 Seldom	1 Unlikely
4 Catastrophic					
3 Severe			➢Tornado ➢Flooding	➢Earthquake ➢Mine Subsidence ➢Landslides	
2 Moderate	➢Thunder-storms	➢Wind Storms	➢Hail Storms ➢Severe Winter Storms	➢Hazardous Material Releases ➢Heat Waves	
1 Negligible					

(High-1; Med.-2; Low-3)				Land Failures	
City of Highland	2	1	1	2	2
Village of Glen Carbon	2	1	1	1	2
City of Alton	1	1	1	1	2
City of Troy	2	1	1	1	2
Village of Bethalto	2	1	1	1	2
City of Granite City	1	1	1	3	2
Village of Livingston	3	1	1	1	2
Village of Roxana	1	1	1	3	2
Village of East Alton	1	1	1	2	2
City of Edwardsville	2	1	1	1	2
City of Venice	1	1	1	3	2
City of Wood River	1	1	1	3	2
Village of Marine	3	1	1	3	2
Village of Pontoon Beach	1	1	1	3	2
Village of Godfrey	2	1	1	1	2
Village of Maryville	2	1	1	1	2

5. Mitigation Strategy

Mitigation Strategy

An important part of any planning effort is to develop a strategy to address the principle goals and objectives set forth in the plan. Based on the review of the community background and the risk assessment, including the identification of past and potential hazards, a mitigation strategy is hereby developed and made part of this plan. The intent of the strategy is to eliminate or minimize damage from hazards in Madison County. The strategy sets forth individual goals and objectives for each hazard and includes a description of current mitigation activities and alternatives considered. It concludes by listing actions and recommendations that are to be followed by local government.

The following goals and objectives are adopted to guide in developing this mitigation strategy:

Madison County Hazard Mitigation Goals

1. To encourage actions that support public safety during hazard events, natural hazard identification and awareness, hazard avoidance, damage minimization, and the mitigation of future severe and repetitive damage due to natural hazards.

2. To make hazard mitigation a public value.

3. To ensure that local and state agencies identify critical buildings, facilities, and infrastructure that are at risk of damage due to natural hazards and to undertake feasible and cost-effective hazard mitigation measures to minimize future losses and expenditures.

4. To promote economic development consistent with floodplain management, building codes, and similar guidance.

5. To develop an effective public awareness program for the natural hazards that Madison County is most likely to experience.

Flood

Flooding Hazard Mitigation Goals

Goals:

Reduce the frequency of flooding and the number of people affected by flooding.

Reduce possibility of damage and loss to existing community assets including addressable structures, critical facilities and infrastructure due to floods.

Promote hazard mitigation as a public value in recognition if its importance to the health, safety, and welfare of the population

Goal Objectives:

- Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities due to floods.
- Protect existing assets with the highest relative vulnerability to the effects of flooding associated with the 100-year floodplain.
- Promote the continuing purchase of flood insurance by property owners in flood hazard areas.
- Address identified data limitations regarding lack of detailed information about individual structures located in the 100 year floodplain and first floor elevations for priority areas
- Provide public education to increase awareness of hazards and opportunities for mitigation
- Provide managers of public entities who will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan
- Promote partnerships between the municipalities and the County to continue to develop a countywide approach to identifying and implementing mitigation actions.
- Promote disaster resistance in the business community.

- Monitor and publicize the effectiveness of mitigation initiatives implemented in the community.

Current Flood Mitigation Activities:

Since 1975, when federal flood plain regulations were adopted locally, there has been an increasing amount of mitigation activities associated with the prevention of flood related damage to structures. Some of these activities are physical improvements to flood control facilities while others are planning or regulatory in nature. The following represents a description of such activities.

Significant flood control facilities have been constructed to properly drain stormwater from the region, while protecting areas adjacent to drainage ways that are in agricultural or urban uses. These facilities are maintained by a number of local units of government. See Attachment "C" for a listing of facilities. Some of the managing units of government include: the Metro-East Sanitary District, Canteen Creek Drainage District, Chouteau Nameoki and Venice Drainage District, Wood River Drainage and Levee District, Cahokia Creek Drainage District, and various municipal and township governments. The Corps of Engineers maintains the Chain of Rocks Canal Levees as part of the Lock 27 navigation system.

Various levels of protection are provided in the area. In the American Bottoms portion of Madison County, the 500-year level of protection from the Mississippi River survived the record flood in 1993. The internal drainage system in the American Bottoms provides a level of protection as low as a 1-year level. The system, while functional, has been poorly maintained in the past because of lack of funding and coordination.

Madison County participates in planning activities that address flood and stormwater drainage issues. One effort that was initiated after flooding events in the 1990's is the Metro-East Regional Stormwater committee. The committee was formed by Madison, St. Clair, and Monroe Counties to find a way to overcome funding and jurisdictional limitations of the current stormwater management system in the three county areas. The Regional Stormwater Committee has advocated legislation that would provide for region wide stormwater management and generate funding from the collection of user fees.

In 2003, the Phase II regulations of the Clean Water Act became effective for Madison County. Most of the units of government in Madison County are MS4 permittees under this law. The affected units of government have obtained a NPDES permit from the Illinois Environmental Protection Agency and are in year two of a five-year implementation period for carrying out the activities set forth in the permit. These activities include meeting the minimum control measures under the law including storm water management programs that address public education and outreach, public participation, illicit discharge detection and elimination, construction site storm water runoff control, post construction storm water management in new developments, and pollution prevention. While the Phase II program is generally targeted at clean water, the residual effects of the various programs benefit storm water management objectives.

There have been some FEMA buyouts of flood prone structures. After the Mississippi River Flood of 1993, FEMA and IEMA provided funding to buy residential property on Chouteau Island. The buyout has removed all residents from Chouteau Island. The pre-1993 population was approximately 200 people. IEMA and FEMA also funded the cleanout of critical ditches in the Metro-East Area after the 1996 flood that increased the flood control capacity. The clean out of County Ditch and the upper reaches of Cahokia Canal were included in this project. During the summer of 1997, NRCS agreed to provide 75% of the funds required to clean out additional ditches. Projects included Cahokia Canal from Horseshoe Lake Road to Canteen Creek, Judy's Branch, Schoolhouse Branch, Burdick Branch, and Schneider Ditch. After the cleanouts, a few units of local government accepted maintenance responsibility for some of the drainage ways.

Madison County completed a stream bank restoration project on Judy's Branch in 1994. Stream bank restorations were also completed on Wood River Creek, Cahokia Creek and several smaller tributaries.

The Corps of Engineers is in the design stage

on a project to rehabilitate Canteen Creek. This is the final stage of a bigger American Bottoms' rehabilitation project. The Corps of Engineers has also completed construction along the Chain of Rocks Canal to improve seepage berms, add relief wells, and add pumping capacity. The Corp of Engineers has completed a draft report investigating the existing condition of the Wood River Levee system. The purpose of this report is to determine what actions are required to return the levee, pump stations, and other appurtenant features to a condition that ensures their original degree of protection into the future. The project has been submitted to Congress for authorization. Local sponsorship for the project will be necessary for it to advance.

Madison County is cooperating with St. Clair County, the Metro-East Sanitary District, OWR, and the Corps of Engineers in planning and designing assistance to complete an environmental enhancement project. The project is called the East St. Louis and Vicinity Ecosystem Restoration and Recreation Project. The project's focus is to enhance and preserve wetlands and water bodies that are critical in providing adequate flood control and stormwater storage in the American Bottoms. The project will also reduce sedimentation in the drainage system. The study has been completed and the project is awaiting congressional authorization. One drainage improvement that is part of the plan is scheduled to be completed as part of a "pilot" that will guide further projects. This project involves the improvement to portions of Judy's Creek that is part of the American Bottoms.

Madison County and most of its municipalities, have adopted a flood plain management ordinance that requires flood proofing and elevating structures when one is permitted in a flood hazard area. Madison County has enacted an additional freeboard requirement increasing the finished floor elevation requirement to two feet above the base floor elevation. Additionally, structures are not permitted in flood hazard areas unless verification is provided either with flood hazard mapping or elevation certificates. Madison County has also adopted a repetitive loss provision in its flood plain regulation in attempt to regulate the continued restoration of flood damage structures to eventually mitigate the hazard from the flood area.

Madison County has adopted a Stormwater Detention and Sediment Control Ordinance that requires new developments to meet standards that are designed to lessen sedimentation and downstream flooding.
The County has collaborated with FEMA to update the flood study of Madison County and generate digitized mapping of flood hazard areas. The project is scheduled for completion in 2005. This will greatly enhance local government's ability to regulate development near flood hazard areas as well as engage in mitigation planning.

An emergency operations plan is also maintained that addresses various measures to be undertaken both before and during a disaster event.

Flooding Mitigation Alternatives Considered:

Recommendations are made as part of this plan. The recommendations are listed in the next section. Other alternatives were also considered. Those considered but not chosen include, clearing all floodplains of residents and suspending development. Neither of those alternatives are practical. The amount of development and industry in the American Bottoms makes a total buyout impractical. Transportation facilities are needed through the area. Suspending development is not practical because development is needed to sustain the economic well being of Madison County.

Partial buyouts of areas with existing structures in the floodplain is an alternative, but is subject to finding financial assistance at the state or local level to help pay for the buyouts. Funding for buyout programs is limited at the local level due to the lack of available funding. These projects often compete with other governmental services, such as public safety and public works, for funding.

Other alternatives are documented in specific Watershed Resource Plans for Canteen Creek, Schoolhouse Branch, Long Lake, Judy's Branch and Burdick Branch. Plans developed for the watersheds identify low-lying areas in the American Bottoms that would be suitable for preservation as wetlands or dry detention areas. The plans also identify potential storage sites in the uplands. The alternative of protecting the natural and beneficial functions of the floodplain was also considered.

Additional alternatives of significance include: elevation of structures, dry-flood proofing of accessory structures or of garages below a residential structure, entering the Community Rating System, better floodplain mapping, restraining structures, debris flow measures, grading changes, and vegetation placement. Extensive public education at all levels is considered essential to flood hazard mitigation.

Flooding Mitigation Actions/Recommendations:

The following actions and recommendations are listed in ascending order by time period estimated for implementation. When the responsible agency is referred to as County and Municipalities, it includes Madison County and all municipalities that have been identified to be part of this multi-jurisdictional plan.

Action/ Recommendation	Responsible Agency	Time Frame	Funding Source
Recommendation 1. Strict enforcement of floodplain ordinances including requiring elevation certificates to verify compliance in flood fringe areas.	County and Municipalities	Immediate	In-kind services
Recommendation 2. Implementation and enforcement of uniform storm water detention and sediment and erosion control ordinances.	County and Municipalities	Year One	In-kind services
Recommendation 3. Preservation of flood plains and wetlands in land uses compatible with flooding.	County and Municipalities	Next update of Community Plan	In-kind services
Recommendation 4. Distribution of information on flood protection and proofing to the general public.	County and Municipalities	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 5. Assure that mowing and sediment removal is made part of drainage district maintenance plans.	Drainage Districts	Year Two and Year Three	In-kind services and State Grants
Recommendation 6. Detain water upstream in new developments.	Developers	Year Two	Developers
Recommendation 7. Develop education programs and cleanup days for local streams and ditches.	County, Townships and Municipalities	Year Two	In-kind services and State Grants
Recommendation 8. Utilized Geographical Information System as an analytical tool to identify hazard areas and provide easily accessible information to the public to assist in avoiding hazards. Create data layer	County and Municipalities	Year Two	In-kind services

indicating the location of all critical facilities.			
Recommendation 9. Implement enforcement of repetitive loss regulation and the flood plain management ordinance.	County and Municipalities	Year Three	In-kind services
Recommendation 10. Provide for regional coordination of flood control and storm water management planning.	Multi-county, Municipalities, and State	Year Three	Local stormwater funding or PDM and HMGP Funding
Recommendation 11. Modify existing flood management program to conform to the Community Rating System program. Apply for Community Rating System designation.	County and Municipalities	Year Three	PDM and HMGP Funding and In-kind services
Recommendation 12. Apply for a grant to promote the education of flood proofing and retrofitting existing homes against hazards.	County and Municipalities	Year Three	PDM and HMGP Funding
Recommendation 13. Identify critical facilities located in a flood hazard area, including hospitals and other medical facilities, emergency operations centers, critical government facilities, police and fire stations, shelter locations, storage facilities, nursing homes, and apartment buildings. (Also, develop building data to assist in assessing potential losses.) These facilities should be targeted for both public education or risk reduction and for emergency operations personnel for response purposes.	County and Municipalities	Year Three	In-kind services and PDM and HMGP Funding
Recommendation 14. Encourage building elevation of structures in frequently flooded areas.	County and Municipalities	Year Four	PDM and HMGP Funding
Recommendation 15. Utilize low-lying areas, especially in the American Bottoms, to store storm water.	County and Municipalities	Year Five	State and Federal Grants
Recommendation 16. Assure that wetland mitigation replaces lost water storage as well as wildlife habitat.	State and Federal Government	Year Five	Responsible Party
Recommendation 17. Manage water by watershed to provide for more effective planning and improvement.	State and Local Government	Year Five	In-kind services and State Grants.

Recommendation 18. Increase the capacity of the drainage system.	Federal, State and Local Government	Year Five	State Grants and Federal Grants
Recommendation 19. Take advantage of existing sand pits for sediment storage where possible.	Federal, State and Local Government	Year Five	State Grants and Federal Grants
Recommendation 20. Plan for controlled levee overtopping.	Federal, State and Local Government	Year Five	State Grants and Federal Grants
Recommendation 21. Use buyouts to relieve homeowners in frequently flooded areas.	County and Municipalities	Year Five	PDM and HMGP Funding
Recommendation 22. Use partial buyouts where land is purchased and house is relocated to relieve homeowners in frequently flooded areas.	County and Municipalities	Year Five	PDM and HMGP Funding
Recommendation 23. Examine the use of FEMA's HAZUS program to better develop risk assessment data and loss estimation for flooding hazards. Obtain lowest floor elevations of structures in flood zones. Utilize Madison County's GIS layers with HAZUS program to fully develop the program's ability to predict damage from a flood.	County and Municipalities	Year Five	In-kind services and PDM and HMGP Funding

Severe Weather

Severe Weather Hazard Mitigation Goals

Develop a comprehensive approach to the mitigation of hazards associated with sever weather.

Reduce possibility of damage and loss to existing community assets including addressable structures, critical facilities and infrastructure due to severe weather.

Promote severe weather hazard mitigation as a public value in recognition if its importance to the health, safety, and welfare of the population

Goal Objectives:

- Encourage and facilitate the adoption of building codes that provide protection for new construction and substantial renovations from the effects of identified hazards.
- Provide adequate and consistent enforcement of ordinances and codes within and between jurisdictions.
- Discourage activities that exacerbate the impact of severe weather.
- Provide public education to increase awareness of hazards and opportunities for mitigation.
- Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities due to severe weather in terms of high winds and heavy snow and ice loading.
- Address identified data limitations regarding lack of detailed information about individual structures, other critical facilities and infrastructure with the highest relative vulnerability to the effects of high wind events and heavy snow loads including characteristics of individual structures such as construction type, age, condition, compliance with current building codes, etc.

Current Severe Weather Mitigation Activities:

A significant mitigation activity for Madison County is its enforcement of the International Building Code. The Code addresses building requirements pertinent to structures including those damaged by high winds, snow loads, and ventilation. Building codes are updated every three years and include advancements in securing the structural elements of buildings. The building code applies to both new structures and modified structures.

Other mitigation activities include the promotion of underground utilities for new development and enhanced anchoring and tie down of accessory structures.

Madison County, through its Emergency Management Agency, has a comprehensive emergency management plan that includes the coordination of multiple agencies and bodies. Some of the elements include: maintenance of an Emergency Operations Plan that sets forth situations and assumptions associated with a specific hazard, operation guidelines for addressing the hazard, assignment of responsibilities, and communication and warnings. The Plan also details public communication to assist in avoidance of the hazard. The public is given information regarding actions to be taken to minimize the loss resulting from the hazard. The media is used to disseminate information to the public and government officials provide assistance as well.

Early warning procedures are established including weather-spotting, communication with law enforcement entities, and warning system activation. Coordination with the EMA, 911 PSAP, local police and fire departments, and the National Weather Service is a key part of the advanced warning system.

The Madison County Health Department is the lead agency issuing information ads in newspapers and radio stations and giving advice to the public on how to deal with extreme temperatures. Public buildings are organized for use as air-conditioned cooling

shelters as part of the program.

Severe Weather Mitigation Alternatives Considered:

In addition to the actions and recommendations listed below, other alternatives were also considered. Alternatives considered, but not chosen, include requiring the installation of underground utilities and the alteration of existing structures to meet current building codes. Neither of those alternatives are economically practical.

Alternatives such as promoting the use of roofing materials that are less susceptive to damage from high winds, bracing elevated platforms, anchoring and tie downs of structures, and tree management are more practical. Also, promoting underground power lines, and backup power resources for critical facilities are realistic for new developments.

Engaging in extensive public education and the strict enforcement of building codes associated with severe weather hazard mitigation was considered and addressed in the recommendations.

Severe Weather Mitigation Actions/Recommendations:

The following actions and recommendations are listed in ascending order by time period estimated for implementation. When the responsible agency is referred to as County and Municipalities, it includes Madison County and all municipalities that have been identified to be part of this multi-jurisdictional plan.

Action/ Recommendation	Responsible Agency	Time Frame	Funding Source
Recommendation 1. Maintain and enforce building codes and update when revised codes have been published.	County and Municipalities	Immediate	In-kind services
Recommendation 2. Improve public awareness of measures that can be taken to avoid damage related to severe weather.	County and Municipalities	Year One	In-kind services
Recommendation 3. Maintain a strong emergency management system including enhanced planning.	Emergency Management Agency and Public Safety Agencies	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 4. Promote the modification of critical facilities to include backup power resources.	Emergency Management Agency and Public Safety Agencies	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 5. Develop a hazard prevention program for heat waves including call-in numbers and cooling centers.	County Health Department	Year Two	In-kind services and PDM/ HMGP Funding

Recommendation 6. Target critical facilities for public education and risk.	Emergency Management Agency and Public Safety Agencies	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 7. Develop a retrofitting program that will provide for recommendations to older buildings to bring up to current code standards to better avoid damage from severe weather.	County and Municipalities	Year Three	In-kind services and PDM and HMGP Funding
Recommendation 8. Improve emergency warning systems in areas lacking.	Municipalities and Public Safety Agencies	Year Five	Local Funds and State Grants
Recommendation 9. Examine the use of FEMA's HAZUS program to better develop risk assessment data and loss estimation for earthquake hazards. Utilize Madison County's GIS layers with HAZUS program to fully develop the program's ability to predict damage from a tornado.	County and Municipalities	Year Five	In-kind services and PDM and HMGP Funding

Earthquake.

Earthquake Hazard Mitigation Goals

Develop a comprehensive approach to the mitigation of hazards associated with earthquakes.

Reduce possibility of damage and loss to existing community assets including addressable structures, critical facilities and infrastructure due to earthquakes.

Adopt and enforce strict codes for buildings, utilities, and public infrastructure.

Promote earthquake hazard mitigation as a public value in recognition if its importance to the health, safety, and welfare of the population

Goal Objectives:

- Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities due to an earthquake.
- Encourage and facilitate the adoption of building codes that provide protection for new construction and substantial renovations from the effects of identified hazards.
- Provide adequate and consistent enforcement of ordinances and codes within and between jurisdictions.
- Discourage activities that exacerbate existing hazardous conditions.

Current Earthquake Mitigation Activities:

Madison County has enacted measures to plan, prepare for, and minimize the effects of damaging earthquakes. It has adopted the International Building Code and the National Fire Prevention Code. The codes address building requirements for structures including those pertinent to damage associated with earthquakes. Building codes are updated every three years and include advancements in securing the structural elements of buildings.

Other mitigation activities include the promotion of preventive measures that may be taken to lessen damage during an earthquake. This includes the disruption of communications, power, gas, sewer, and water system.

Public utilities and public work officials have adopted design standards that would protect roads, bridges, water, sewer, and other utilities from significant damage as a result of an earthquake.

When disruptions occur, the Madison County EMA has established priorities and procedures for the use of available resources, the priorities for the restoration of utilities, communications, and transportation networks in the event of an earthquake.

There is a high probability of hazardous materials incidents due to earthquakes. Hazardous materials incidents also have a high probability of occurrence because of ground shaking from an earthquake. There are ongoing efforts to increase the public's awareness and preparedness for the possibility of such an event in order to reduce the casualties, injuries, and damages, which would result.

Madison County, through its Emergency Management Agency, has a comprehensive emergency management plan that coordinates activities of multiple agencies and bodies. Some of the elements include: maintenance of an Emergency Operations Plan that sets forth situations and assumptions associated with a specific hazard, operation guidelines for addressing the hazard, assignment of responsibilities, and communication and warnings. The plan also details public communication to assist in avoidance of the hazard. The public is given information regarding actions to be taken to minimize the loss. The media is used to disseminate information to the public and government officials provide information as well.

Earthquake Mitigation Alternatives Considered:

In addition to the actions/recommendations, alternatives considered but not chosen include replacement of infrastructure and the modification of structures to comply with building codes. The costs would be substantial and would require major investments by property owners. This alternative is deemed impractical.

Other alternatives considered and included as

part of this plan include: the promotion of infrastructure hardening, the strengthening of structures, anchoring of accessory structures, the development of a retrofitting program, promoting the flexible connections of gas fixtures, the strict enforcement of building codes, and increasing public awareness.

Earthquake Mitigation Actions/Recommendations:

The following actions and recommendations are listed in ascending order by time period estimated for implementation. When the responsible agency is referred to as County and Municipalities, it includes Madison County and all municipalities that have been identified to be part of this multi-jurisdictional plan.

Action/ Recommendation	Responsible Agency	Time Frame	Funding Source
Recommendation 1. Maintain building codes and update when revised codes have been published.	County and Municipalities	Immediate	In-kind services
Recommendation 2. Maintain a strong emergency management system including enhanced planning.	Emergency Management Agency and Public Safety Agencies	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 3. Utilize the Madison County Geographical Information System to map all critical facilities to be used for mitigation planning for earthquake hazards.	County and Municipalities	Year Two	In-kind services
Recommendation 4. Target critical facilities for public education and risk.	Emergency Management Agency and Public Safety Agencies	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 5. Improve public awareness of measures that can be taken to avoid damage related to earthquakes including reinforcing masonry buildings, anchoring tall bookcases and file cabinets, installing latches on drawers and cabinet doors, restraining desktop computers and appliances, using flexible connections on gas and water lines, anchoring gas appliances, mounting framed pictures and mirrors securely, and anchoring and bracing propane tanks and gas cylinders.	County and Municipalities	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 6. Provide for	County and	Year Three	In-kind services/

information and warning to responders of secondary effects of aftershocks, Hazardous material emergencies (spills, leaks, etc.), weakened dams and levees, and loss or public water supplies or pollution of these supplies	Municipalities		PDM and HMGP Funding
Recommendation 7. Promote infrastructure hardening to meet earthquake design guidelines.	County and Municipalities	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 8. Promote the maintenance of earthquake insurance by businesses and homeowners to eliminate the financial hardship if a significant earthquake were to occur.	County and Municipalities	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 9. Promote the modification of critical facilities to include backup power resources and other capital improvements to assure these buildings may function after an earthquake.	Emergency Management Agency and Public Safety Agencies	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 10. Assemble building data for critical facilities including building type/type of foundation, age of building, building code design level, and roof material and construction and promote the use of retrofitting programs to bring the facilities up to current code standards or better.	Emergency Management Agency and Public Safety Agencies	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 11. Develop a retrofitting program that will provide for recommendations to older buildings to bring up to current code standards to better avoid damage from earthquakes.	County and Municipalities	Year Three	In-kind services and PDM and HMGP Funding
Recommendation 12. Examine the use of FEMA's HAZUS program to better develop risk assessment data and loss estimation for earthquake hazards. Utilize Madison County's GIS layers with HAZUS program to fully develop the program's ability to predict damage from an earthquake.	County and Municipalities	Year Five	In-kind services and PDM and HMGP Funding

Other Hazards

Other Hazard Mitigation Goals:

Develop a comprehensive approach to the mitigation of hazards associated with other hazards.

Reduce the possibility of damage and loss to existing community assets including addressable structures, critical facilities and infrastructure due to other hazards.

Promote hazard mitigation as a public value in recognition if its importance to the health, safety, and welfare of the population

Goal Objectives:

- Address identified data limitations about probabilities for human-caused events including: contamination due to hazardous materials releases along key stretches of transportation corridors.
- Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities due to mine subsidence.
- Protect existing assets with the highest relative vulnerability to the effects of mine subsidence, slope failure, and hazardous material releases.

Current Other Mitigation Activities:

Other hazards addressed in this mitigation plan are subsidence, landslides, and hazardous material releases. The threat of terrorism is substantially addressed by public safety officials both in terms of the threat and the response to that threat. There is little in terms of mitigation that may be done but as information becomes available as this relatively new area of study develops, the matter will be addressed in detail in future updates.

Current efforts to address subsidence and landslides are related to the enforcement of zoning, subdivision, and building codes. In addition, Madison County has developed a geographical information system that includes the location of undermined areas and steep slopes. This system is useful for planners, architects engineers, and developers in determining areas to avoid or to take preventive measures.

The Emergency Management Agency has an emergency management plan that addresses the avoidance and response of hazardous material releases. The agency involves public safety agencies at the local, state, and federal levels in planning for these events.

Other Mitigation Alternatives Considered:

In addition to those actions and recommendations outlined below, alternatives considered, but not chosen, include restricting development in areas of undermining, and clearing existing development in the same area. This was selected because it was determined the cost would be excessive for private property owners to bear and thus not feasible.

Other alternatives considered and accepted were the promotion of infrastructure hardening and the strengthening of structures in areas known to have undermining hazards. Finally, increasing public awareness of other hazards was considered and made part of the recommendations.

Other Mitigation Actions/Recommendations:

The following actions and recommendations are listed in ascending order by time period estimated for implementation. When the responsible agency is referred to as County and Municipalities, it includes Madison County and all municipalities that have been identified to be part of this multi-jurisdictional plan.

Action/ Recommendation	Responsible Agency	Time Frame	Funding Source
Recommendation 1. Maintain building	County and	Immediate	In-kind services

codes and update when revised codes have been published.	Municipalities		
Recommendation 2. Improve public awareness of measures that can be taken to avoid damage related to various other hazards including mine subsidence, landslides, and hazard material incidents.	County and Municipalities	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 3. Improve public awareness in undermined and steep sloped areas of measures that can be taken to avoid or repair damage related to subsidence including reinforcing foundations, underground plumbing, and other corrective measures.	County and Municipalities	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 4. Maintain a strong emergency management system including comprehensive planning with federal and state agencies, and local public safety officials.	Emergency Management Agency and Public Safety Agencies	Year Two	In-kind services/ PDM and HMGP Funding
Recommendation 5. Utilize Madison County Geographical Information System as an analytical tool to identify hazard areas and provide easily accessible information to the public to assist in avoiding hazards.	County and Municipalities	Year Two	In-kind services
Recommendation 6. Utilize the Madison County Geographical Information System to map critical facilities to be used for mitigation planning for other hazards.	County and Municipalities	Year Two	In-kind services
Recommendation 7. Promote the maintenance of mine subsidence insurance by businesses and homeowners who have structures in areas known to be undermined to eliminate the financial hardship if subsidence damage were to occur.	County and Municipalities	Year Three	In-kind services/ PDM and HMGP Funding
Recommendation 8. Target critical facilities for public education and risk.	Emergency Management Agency and Public Safety Agencies	Year Three	In-kind services/ PDM and HMGP Funding

6. Funding of Alternatives

Funding of Alternatives

The Hazard Mitigation Plan will be implemented by each jurisdiction for areas within their boundaries. Madison County will be responsible for implementation of the plan in the unincorporated areas. It is recognized that some activities overlap and intergovernmental cooperation will exist and funding provided appropriately. The plan recommendations outlined in the previous section are measures that will be implemented based on available in kind resources and various outside funding sources.

A more specific description of funding for the various prioritized hazards is listed below. This section provides an overview of possible funding sources that will be utilized as part of the implementation of this plan.

Local governments in Madison County depend heavily on property taxes and sales tax as their major source of revenue. This revenue is utilized to provide primarily the day-to-day services of the community. If there is a surplus of funding, it may be possible to use it for mitigation activities. While resources for funding at the local level are limited, some tasks may be implemented more quickly than others because they may be handled by in-kind resources.

For example, local government entities will continue to fund education programs and regulatory programs such as building and zoning codes, and enforcement of floodplain regulations.

Property owners will be requested to engage in certain mitigation actions such as elevating structures, flood proofing structures, and reinforcing them to withstand the various hazards.

Another source of revenue for mitigation activities is grants from the state and federal government. Each jurisdiction should pursue funding from these sources to assist in with mitigation activities identified in this plan. With adoption of the Mitigation Plan, each entity will become eligible for hazard mitigation grants.

A specific time frame has not been established for funding activities because of the number of unknowns involved with the various different activities. A general time frame is listed with each previous listed recommendation. Soliciting outside funding from federal, state and non-governmental sources will be subject to appropriations by legislative authorities and agency grant prioritization.

Funding of Flooding Alternatives.

Finding funding for mitigation activities has been a major concern of local officials in Madison County for several years. Because of recent planning activities, officials have learned that mitigation projects will cost millions of dollars. No jurisdiction located within Madison County has the financial resources to fund the flood hazard mitigation projects needed. As discussed above, in-kind resources and grants will be responsible for most mitigation programs.

A local, state and federal partnership is necessary to fund all the mitigation projects needed in Madison County. These projects not only include buy out programs, but also major stormwater drainage modifications. Because Madison County's geographical setting has significant development in the American Bottoms, interior flood control is a major issue. Several planning initiatives have been undertaken with federal funding partners participating, including the NRCS, Corps of Engineers and FEMA. Major state funding partners have included OWR and IEMA. Local partners for funding are local Drainage and Levee Districts, the County, Townships, and Municipalities. Because of recent floods and other priorities, local funding resources are limited.

One method of funding promoted by many local officials is the assessment of user fees on impervious surfaces. Legislation was passed in 2005 by the Illinois General Assembly that would authorize Madison County to collect a user fee for stormwater management purposes. A voter's referendum would need to pass to permit this. It is anticipated that the issue of a user fee will continue to surface, particular after major stormwater events that cause damage in the area.

Preventative projects could be initiated by requiring onsite detention on all new developments. Rules governing detention requirements vary from one jurisdiction to another. Recent MS4 permits contain plans for

adoption of stormwater detention requirements for new developments.

Local governments will continue to fund the enforcement of zoning regulations, subdivision and land development regulations, and flood plain regulations. Another activity that may be funded by local government is educational programs that are aimed at enlightening citizens regarding the vulnerability to natural hazards and the necessary steps to reduce that vulnerability. This helps to minimize future flood damage and makes development more resistant to damage.

The flooding recommendations minimize future flood damage, preserve environmental resources, promote long-term economic prosperity, and protect the lives of our citizens from natural and man-made hazards.

Funding of Severe Weather Alternatives.

Local government will continue to fund emergency response programs including early warning sirens and educational programs aimed at informing the public of the proper measures to take in order to protect life and property from severe weather hazards.

Building codes shall be strictly enforced to assure that modern construction techniques are followed that provide for structures that are built to withstand damage from severe weather. Cities and the County will keep building codes up to date and maintain adequate staff, with proper training, to assure they are properly enforced.

Private property owners will be responsible for making modifications to existing structures to make them less susceptible to damage from severe weather. Structures not built to current code standards may be modified to withstand damage from severe weather.

The local governments will also provide educational materials that promote retrofitting structures when necessary to minimize damage from severe weather.

Utilities will be responsible for costs associated with maintaining utility lines, in particular placing them underground where financially feasible. New development will be encouraged to install all transmission lines below ground as part of development regulations imposed by local government.

Although local funding will be used for these purposes, communities are still encouraged to apply for state and federal grants to help with these efforts, as well as other severe weather mitigation activities.

Funding of Earthquake Alternatives.

Funding for earthquake alternatives will be from public and private sources. Local governments shall continue to enforce building codes on new and redeveloped structures to assure that minimum codes are met to avoid damage from earthquakes. Building codes minimize damage by requiring structures to be built in a fashion to protect the lives of our citizens from natural hazards.

Local governments shall be responsible for public education about the methods necessary to mitigate hazards associated with earthquakes. Educational programs assist the public with the steps necessary to minimize damage from an earthquake.

Public utilities and public works departments will continue to fund improvements to utilities, bridges and other public infrastructure to assure damage is minimized from earthquake activity. As discussed in earlier chapters, public facilities must withstand damage from natural hazards in order to avoid disruptions of services both during a response and afterwards. While these funding for these types of projects are often limited, when available, the necessary measures will take place.

It will be the responsibility of private property owners to make modifications to existing structures to make them more “earthquake proof” thus minimizing damage that may occur. The local government entities will promote standards for existing homes to be retrofitted to exceed minimal codes.

Although local funding will be used for these purposes, communities are still encouraged to apply for state and federal grants to help with these efforts.

Funding of Other Alternatives.

The responsibility for funding other alternatives

primarily will fall on private property owners, particularly in cases where mine subsidence is the hazard. Repairs and structural reinforcements of buildings is typically how damage is corrected and further damage improvements will be borne by the property owner.

Likewise, funding for activities associated with landslides will be borne by private property owners. Retrofitting structures and controlling erosion will be common practices. Units of local government will fund its regulatory programs, such as building, zoning, and subdivision codes to prevent development in high risk areas.

Local government will continue to work with public safety agencies to address hazard material hazards. An emergency response plan has been developed and shared responsibility exists for addressing these matters. The local government entities coordinate their assistance and receive financial assistance from state and federal resources.

Finally, units of government will rely on grants from state and federal resources for other mitigation activities. These activities will target the mitigation of the various other types of hazards outlined in the mitigation strategy.

avoided. While local government will assist in providing funding for education, including maintaining mapping through GIS resources of areas with past mining activities, the cost for the

(7) Mitigation Plan Evaluation and Maintenance

Mitigation Plan Evaluation and Maintenance

The Hazard Mitigation Act requires a formal plan maintenance process to ensure the Mitigation Plan remains an active and pertinent document.

Recognizing that this plan must be updated on a regular basis to remain an effective tool, Madison County has developed a timeline and for updating the plan. The process, as outlined below, will guide local government in future years as people change, communities' change, and planning and mitigation strategies change.

The plan maintenance process includes a schedule for monitoring and evaluating the plan at least every year and continued public participation throughout this effort. This is a similar process to what was used to originally formulate this document.

The Mitigation Plan evaluation and maintenance will occur as follows. The Madison County Planning and Development Department and the Emergency Management Agency will annually review each mitigation goal and objective to determine their relevance to changing situations and land developments in the County. They will review changes in state or federal policy to ensure that they are addressing current and expected conditions. The review will also include the risk assessment portion of the plan to determine if this information should be updated or modified.

The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised. Through this collaboration, judgments can me made regarding necessary modifications to the plan.

Any municipality who has approved this plan will also do an annual review it to determine whether updating is necessary. Their review will be similar to that outlined above. They too will make any needed change in the plan.

Madison County and other jurisdictions that are part of this planning effort have a number of other plans and ordinances to consider and integrate with this Hazard Mitigation Plans. These plans and ordinances include, but are not inclusive to, the Comprehensive Plan, Capital Improvement Plan, and Zoning/Land Use Ordinances. Revisions to these plans will occur during their regular updates. Revisions to ordinances will occur as previously prioritized in the actions/recommendations portions of this plan. Revisions to all plans and ordinances are followed in accordance with state law as well as the municipal or county code of those municipalities. In most cases, the governing body of the unit of local government must approve revisions after a recommendation from the appropriate commission. This process typically involves the participation of the public through a public hearing or other means.

In addition to the annual reviews, a full evaluation of the Hazard Mitigation Plan will be performed once every five years. The review will follow a similar process used to originally develop this plan. Included in the review will be the full participation of the public and the units of government in: the risk assessment, the mitigation strategy, and any other necessary modifications. Similar public notices and public hearing mechanisms will be utilized for the review and update.

Additional evaluation will occur and be incorporated in the revised plan including whether:

- The goals and objectives address current and expected conditions.
- The nature, magnitude, and/or type of risks changed.
- The current resources are appropriate for implementing the plan.
- There are implementation problems, such as technical, political, legal, or coordination issues with other agencies, political, legal, or coordination issues with other agencies.
- The outcomes have occurred as expected.
- The agencies and other partners participated as originally proposed.

Madison County will submit the updated plan to the State Hazard Mitigation Officer and FEMA within one year of the review. If no changes are necessary, the State Hazard Mitigation Officer will

be given a justification for this determination as part of this submission.

As modifications are made to the Hazard Mitigation Plan, as the result of annual or five-year reviews, other appropriate plans and ordinances will be revised accordingly.

ATTACHMENTS

A - Adoption by Governing Body

B - Past Studies, Community Plans and Utility Providers

C - Existing Flood Control Facilities

D - Historical Climate Data - Precipitation

E - Historical Climate Data - Snowfall

F - Historical Climate Data – Temperature

G - Historical Climate Data - Tornados

H - Earthquake Hazard Map

I - Earthquake Zone Map

J - Madison County GIS Risk Assessment Program

K - Inventory of Assets

L – Madison County Population and Land Density

M - Madison County Housing Characteristics

N - Critical Facilities Report Sample

O - 2020 Land Use and Resource Management Plan

P - Undermined Areas

Q - Existing Land Cover

R - Stormwater Management Inventory

S - Water Distribution Map

T - Sewer Distribution Map

Attachment “A”

(RESOLUTION ADOPTING PLAN)

.

Attachment "B"

Past Studies, Community Plans and Utility Providers

Comprehensive Development Plans

Madison County 2020 Land Use Plan

The following municipalities have also adopted plans:

Alton
Bethalto
Collinsville
Edwardsville
Glen Carbon
Godfrey
Granite City
Hamel
Highland
Marine
Maryville
Pontoon Beach
St. Jacob
Troy
Wood River

Plans for Major Improvement Projects

State of Illinois

Division of Water Resources – Drainage Plans

IDOT – Transportation Improvement Plans

U.S. Corp of Engineers

East St. Louis and Vicinity Ecosystem Restoration and Recreation Project
Limited Re-evaluation Report on the Report Levee System (Draft – 1/05)

Madison County Highway Department Five Year Capital Improvement Plan

Metro East Sanitary District Drainage Plan

Wood River Drainage and Levee District Drainage Plan/Levee Rehabilitation

Past Studies on Storm Water Drainage

Inventory of Illinois Drainage and Levee Districts, 1971 (State of Illinois)

Wood River Drainage and Levee District, Improvement Plan, 1977, (U.S. Army Corp of Engineers)

Plan for Major Drainage, Madison, St. Clair, Monroe and Randolph Counties, Illinois, 1976 (Southwestern Illinois Metropolitan and Regional Planning Commission)

Cahokia Canal Drainage Area, Environmental Inventory Report, 1981, U.S. Army Corp of Engineers

Draft Reevaluation Report and Environmental Assessment, Cahokia Canal/Hillside Drainage areas, 1985.

"An Archeological Survey of the American Bottoms in Madison and St. Clair Counties, Illinois." 1957, (Illinois State Museum Reports of Investigations)

Environmental Inventory Report: East St. Louis and Vicinity, Illinois Cahokia Canal Drainage Area, Madison and St. Clair Counties, Illinois, 1981, (Environmental Researchers of Edwardsville, Inc.

A Guide to Development of a Part of American Bottoms, Madison County, Illinois, 1973, Horner and Shifrin, Inc.

Engineering Report: Metro East Sanitary district Rehabilitation - Improvements to Storm Drainage System, 1986, U.S. Army Corps of Engineers.

Summary of State - 1 Problem - Need Identification of the Cahokia Canal, East St. Louis and Vicinity, Illinois, 1979, Planning and Management Consultants, Ltd.

Draft Reconnaissance Report: American Bottom Groundwater Study, 1979, U.S. Army Corps of Engineers.

East St. Louis and Vicinity Ecosystem Restoration and Recreation Study

Past Studies on Earth Quakes

IEMA Critical Facilities Survey (Listing of all critical facilities in Madison County including schools, churches, government buildings, medical facilities, fraternal organization facilities, etc.)

Past Studies and Reports on Emergency Preparedness and Response

Madison County Emergency Operation Plan

Stormwater System Components

Major Rivers:

Mississippi River

Major Watersheds:

Horseshoe Lake
Canteen Creek
Silver Creek

Major Drainage Channels:

Cahokia Diversion Channel
County Ditch
Judy's Branch
Burdick Branch
Schoolhouse Branch
Cahokia Diversion Canal
Nameoki Ditch
Long Lake
Stanley Ditch

Mitchell Ditch
Schnieder Ditch

Municipal Water System

All incorporated places have a municipal water supply. Unincorporated areas are primarily served by public water supplies and private water wells.

Public Water supplies in the County include the following:

Water Supplies with Water Wells

Alhambra
Bethalto
East Alton
Edwardsville
Glen Carbon
Hamel
Hartford
Livingston
Maryville
Roxana
St. Jacob
Troy
Wood River
Collinsville
Holiday MHP

Water Supplies with Surface Water Sources

Highland
Illinois American Water Company

Water Districts/Supplies that Purchase Water from Others

Arlington Water District
Mitchell Water District
Forest Homes Maple Park
Fosterburg
Marine
Meadowbrook
Moro
Pontoon Beach

Sewage Treatment

Most incorporated places are served by sanitary sewage treatment facilities. Some unincorporated areas are also served by sanitary sewage treatment facilities. The remaining portion of the County is served by individual private sewage treatment systems.

Sanitary Sewage Treatment Facilities includes the following:

Alton
Collinsville
East Alton
Edwardsville
Godfrey Utility Board

Granite City
Highland
Holiday Shores
Village of Marine
Troy
Worden
Livingston
Williamson
Hamel
New Douglas
Grantfork
Alhambra
Wood River
Roxana
St. Jacob
Southern Illinois University at Edwardsville

Electric and Gas Utilities

Electric	Ameren UE Company Southwestern Electric Cooperative Highland Electric Cooperative
Natural Gas	Ameren UE Company
Telephone	SBC/Ameritech

Other

Fire Insurance Rating (ISO): Varies for each municipality and each fire district.

Building Code Effectiveness (ISO): Varies for each municipality with a building code

Attachment "C"

Existing Flood Control Facilities

Property Protection and Flood Control:

Existing flood control measures: (mark any that apply)

Mississippi River Levee:

Corps Certified Levee? YES
Design level or height: 442.5 (existing average grade is 445.0)

Hartford Canal Levee:

Corps Certified Levee? N/A
Design level or height: N/A

Alton/East Alton Creek Levee
Corps Certified Levee? N/A
Design level or height: N/A

Canteen Creek Levee
Corps Certified Levee? NO
Design level or height: Variable Elevations

County Ditch Levee
Corps Certified Levee? N/A
Design level or height: N/A

Cahokia Creek Levee

Corps Certified Levee? NO
Design level or height: Variable Elevations

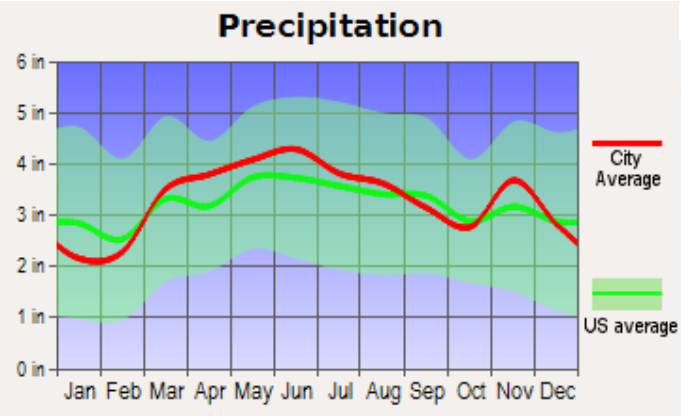
Other:

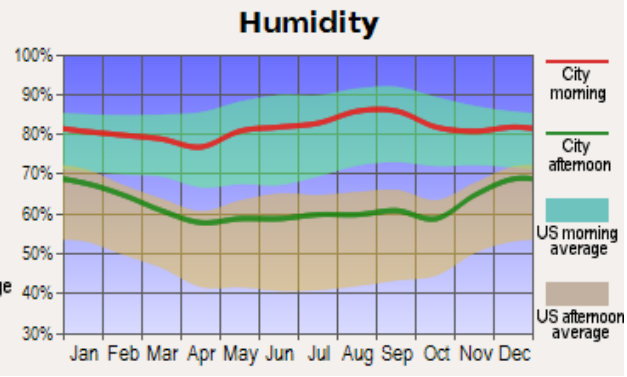
Pump Stations

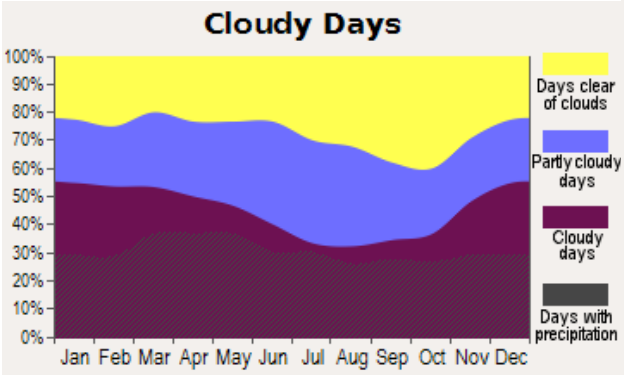
Two pump stations are located at the toe of the East Canal Levee. Interior drainage is pumped into the Chain of Rocks Canal during storm and flood events. The Chouteau, Venice, and Nameoki Drainage and Levee District operate the pump station Chouteau Slough. A second station is located at the south end of the project area, and operated by the Mel Price Support Center.

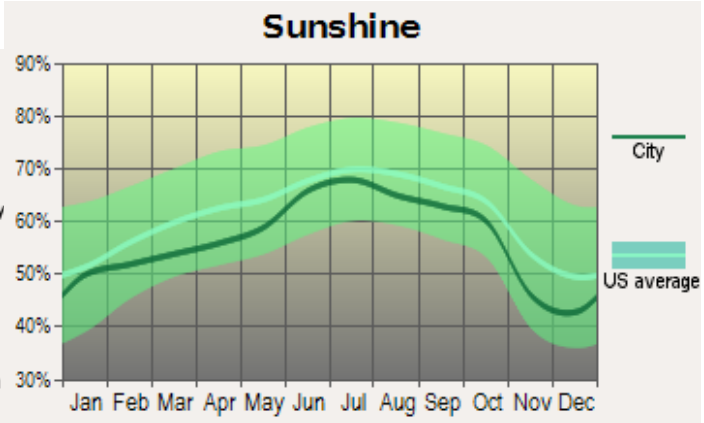
Attachment "D"

Precipitation Historical Climate Data









1971-2000 NCDC Normals Edwardsville Station

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Precip (in)	2.19	2.29	3.52	3.79	4.09	4.36	3.85	3.66	3.16	2.79	3.69	2.82	40.21

Precipitation Extremes - Period of Record: 1910-2001

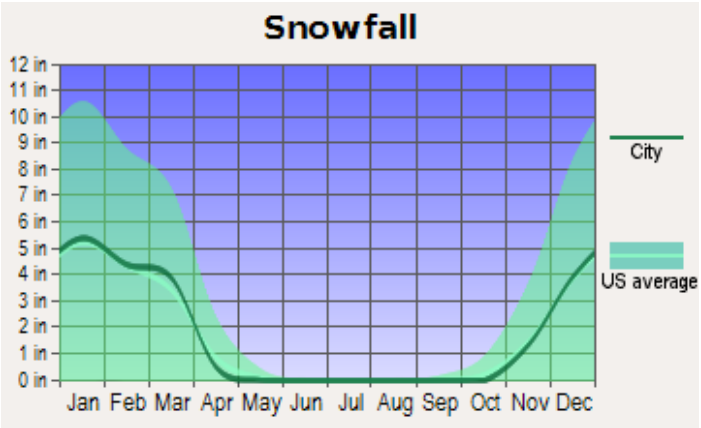
Month	High (in)	Year	Low (in)	Year	1-Day Max (in)	Date
JAN	7.52	1950	0.05	1986	2.83	01-03-1950
FEB	5.79	1951	0.24	1963	3.30	02-07-1999
MAR	10.87	1945	0.13	1910	3.22	03-28-1977
APR	10.56	1944	0.56	1977	5.13	04-22-1944
MAY	14.90	1943	0.46	1914	5.97	05-17-1943

JUN	11.94	1957	0.39	1933	4.45	06-19-1951
JUL	9.51	1948	0.29	1936	6.00	07-14-1912
AUG	17.25	1946	0.06	1971	7.05	08-20-1915
SEP	10.71	1911	0.03	1979	4.64	09-17-1958
OCT	8.89	1919	0.46	1952	3.05	10-05-1910
NOV	9.66	1946	0.12	1910	3.81	11-01-1946
DEC	8.69	1967	0.03	1955	2.68	12-10-1971
Annual	60.33	1946	27.02	1928	7.05	08-20-1915
Winter	15.02	1950	2.23	1970	3.30	02-07-1999
Spring	21.66	1945	3.47	1988	5.97	05-17-1943
Summer	29.28	1915	3.13	1933	7.05	08-20-1915
Fall	18.06	1941	3.57	1920	4.64	09-17-1958

Precipitation Frequency 1971-2000 Averages

Month	# Days Total ≥ 0.01"	# Days Total ≥ 0.10"	# Days Total ≥ 0.50"	# Days Total ≥ 1.00"
JAN	7.8	4.9	1.3	0.5
FEB	7.2	4.6	1.5	0.5
MAR	9.3	7.1	2.3	0.7
APR	10.1	7.0	2.5	0.9
MAY	10.3	7.5	2.7	0.9
JUN	9.3	6.9	3.3	1.3
JUL	7.8	5.8	2.7	1.4
AUG	7.7	5.8	2.8	1.3
SEP	7.1	4.7	1.9	0.7
OCT	7.9	5.6	1.9	0.6
NOV	9.2	6.3	2.4	1.0
DEC	8.1	5.0	1.9	0.8
Annual	101.7	71.2	27.2	10.5
Winter	23.1	14.6	4.7	1.9
Spring	29.7	21.5	7.6	2.5
Summer	24.8	18.4	8.8	3.9
Fall	24.3	16.7	6.2	2.3

Attachment "E"



Snowfall Historical Climate Data

1971-2000 Averages - Edwardsville Station

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Snow(in)	6.8	3.2	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.1	17.8

Snowfall Extremes Period of Record: 1910-2001

Month	High (in)	Year	1-Day Max (in)	Date
JAN	27.0	1987	15.0	01-31-1982
FEB	11.8	1960	7.2	02-28-1984
MAR	17.7	1960	9.4	03-09-1958
APR	8.0	1971	8.0	04-06-1971
MAY	0.0	-	-	-
JUN	0.0	-	-	-
JUL	0.0	-	-	-
AUG	0.0	-	-	-
SEP	0.0	-	-	-
OCT	0.0	-	-	-
NOV	14.8	1951	14.8	11-06-1951
DEC	22.0	1973	10.2	12-20-1973
Season (Jul-Jun)	43.0	1977-1978	15.0	01-31-1982

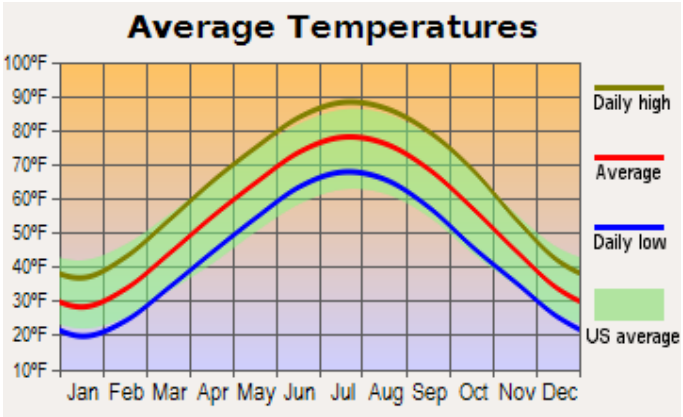
Snowfall Frequency 1971-2000 Averages -

Month	# Days Total ≥ 0.1"	# Days Total ≥ 1.0"	# Days Total ≥ 2.0"	# Days Total ≥ 5.0"
JAN	4.0	2.2	1.1	0.2
FEB	2.2	1.2	0.5	0.1
MAR	1.1	0.7	0.4	0.1
APR	0.2	0.2	0.1	0.0
MAY	0.0	0.0	0.0	0.0

JUN	0.0	0.0	0.0	0.0
JUL	0.0	0.0	0.0	0.0
AUG	0.0	0.0	0.0	0.0
SEP	0.0	0.0	0.0	0.0
OCT	0.0	0.0	0.0	0.0
NOV	0.3	0.2	0.2	0.1
DEC	2.1	1.4	0.7	0.2
Annual	10.0	5.9	3.0	0.7

Attachment "F"

Temperature Historical Climate Data



1971-2000 (Belleville Station)

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Max °F	39.6	46.1	57.2	68.0	77.3	85.7	89.6	87.8	81.6	71.0	56.0	43.7	67.0
Min °F	22.1	26.7	35.5	44.6	53.9	62.5	66.5	63.7	56.0	45.0	36.1	26.5	44.9
Mean °F	30.9	36.4	46.4	56.3	65.6	74.1	78.1	75.8	68.8	58.0	46.1	35.1	56.0
HDD base 65	1059	801	579	277	104	6	0	5	39	246	568	928	4612
CDD base 65	0	0	0	16	121	280	404	338	151	29	0	0	1339

Temperature Extremes - Period of Record: 1948-2001

Month	High Mean°F	Year	Low Mean°F	Year	1-Day Max°F	Date	1-Day Min°F	Date
JAN	41.6	1990	15.9	1977	75	01-24-1950	-27	01-17-1977
FEB	45.3	2000	22.3	1978	81	02-13-1962	-21	02-10-1982
MAR	52.8	1973	30.9	1960	89	03-21-1997	-8	03-05-1978
APR	63.1	2001	50.2	1983	90	04-23-1965	19	04-07-1971
MAY	71.5	1962	58.6	1961	97	05-26-1953	28	05-04-1976
JUN	82.4	1952	69.5	1982	104	06-29-1952	38	06-01-1972
JUL	83.6	1954	71.8	1967	110	07-14-1954	43	07-06-1972
AUG	81.9	1995	69.9	1967	104	08-03-1964	39	08-29-1986
SEP	73.8	1954	63.4	1974	103	09-05-1954	26	09-23-1995
OCT	65.6	1963	51.6	1976	95	10-02-1953	20	10-28-1976
NOV	54.2	1999	38.3	1950	84	11-01-1950	2	11-08-1991
DEC	43.0	1965	22.3	1989	76	12-03-1970	-19	12-22-1989

Annual	59.3	1998	53.3	1979	110	07-14-1954	-27	01-17-1977
Winter	40.5	1992	25.4	1978	81	02-13-1962	-27	01-17-1977
Spring	60.4	1977	50.3	1960	97	05-26-1953	-8	03-05-1978
Summer	80.6	1954	71.7	1967	110	07-14-1954	38	06-01-1972
Fall	61.3	1998	52.1	1976	103	09-05-1954	2	11-08-1991

Temperature Frequency 1971-2000 Averages

Month	# Days Max ≥ 90°F	# Days Max ≤ 32°F	# Days Min ≤ 32°F	# Days Min ≤ 0°F
JAN	0.0	9.2	25.1	1.7
FEB	0.0	5.2	19.2	1.0
MAR	0.0	0.7	13.1	0.1
APR	0.1	0.0	4.1	0.0
MAY	1.1	0.0	0.1	0.0
JUN	9.1	0.0	0.0	0.0
JUL	16.1	0.0	0.0	0.0
AUG	12.4	0.0	0.0	0.0
SEP	5.2	0.0	0.4	0.0
OCT	0.2	0.0	4.1	0.0
NOV	0.0	0.3	12.2	0.0
DEC	0.0	5.0	21.9	1.0
Annual	44.1	20.4	100.3	3.8
Winter	0.0	19.4	66.2	3.8
Spring	1.2	0.7	17.4	0.1
Summer	37.6	0.0	0.0	0.0
Fall	5.3	0.3	16.8	0.0

Attachment "G"

TORNADO HISTORICAL CLIMATE DATA Madison County, IL

Date	Time (CST)	F-Scale	Length (Miles)	Maximum Width (Yards)	Killed	Injured	Property Damage	Source*
6/14/1814	n/a	**n/a**	n/a	n/a	n/a	n/a	n/a	**G**
A tornado moved E across Hamel Township. This tornado was part of a major outbreak, of which very little is known.								
6/2/1860	730 pm	**n/a**	n/a	n/a	n/a	n/a	$100,000	**G**
This event was probably a microburst that moved across Alton.								
5/22/1873	n/a	**F1**	n/a	n/a	n/a	n/a	n/a	**G**
A small tornado moved erratically across Alton, crossing the path of the June 2, 1860 storm. About a dozen buildings had roof and wall damage.								
2/27/1876	350 pm	**F3**	7	400	3	30	n/a	**G**
Moved NE, destroying 11 homes, two churches, and a school in the western part of New Douglas. At one church, where services were in progress, the preacher was killed and many other people injured. Five people were injured in the Masonic Hall. The storm "chased and hit a funeral procession", destroying the vehicles and killing two people in a home where they had sought shelter.								
4/14/1879	1040 pm	**F3**	1	400	1	7	$50,000	**G**
A tornado moved ESE, passing through Collinsville. Ten homes were destroyed, 30 others badly damaged; 75 buildings had lesser damage. Furniture carried 3 miles. A girl died as a two-story home was demolished. Four funnels were reported in the area.								
5/18/1883	800 pm	**F3**	15	n/a	1	3	n/a	**G**
Formed W of Collinsville and moved NE, passing E of Edwardsville to E of Carpenter. A farmhouse was destroyed and a woman who was caught outside was killed 4 miles E of Edwardsville. The house was rebuilt, and then destroyed again in 1938. Another possible tornado in this area unroofed the county courthouse just before midnight.								
5/18/1883	830 pm	**F3**	9	n/a	0	n/a	n/a	**G**
Formed near Prairietown and moved NE into Macoupin County where the most damage and deaths occurred.								
5/18/1883	930 pm	**F3**	25	200	2	10	n/a	**G**
Formed over far northeastern part of the county and quickly moved into Macoupin and Montgomery counties where most of the damage and deaths occurred. Early in the path, it was said to "resemble a huge whip, surrounded by a crimson veil."								
3/28/1896	300 pm	**F2**	4	50	0	1	n/a	**G**
Formed near West Alton, MO and moved NE to near Bethalto. Twenty rural buildings were damaged or destroyed. Twenty-five freight cars were derailed. A man was caught in the open, and carried 50 yards.								

4/12/1903	350 pm	**F2**	5	n/a	0	0	n/a	**G**
Formed 4 miles W of St. Jacob and moved ENE to the north of town. Barns were destroyed and chickens were defeathered.								
8/19/1904	n/a	**F2**	5	70	0	n/a	n/a	**G**
Formed over St. Louis and crossed the river, just missing a ferry boat. Several factories were wrecked at Venice, where it looked like "a gigantic twisting cable". The total damage over the entire track was $100,000.								
4/8/1906	n/a	**F2**	4	n/a	0	0	n/a	**G**
Formed near St. Jacob and moved ENE to near Highland. This tore apart a barn and damaged roofs and a church. Minimal **F2**.								
7/11/1909	1145 am	**F2**	4	30	0	0	n/a	**G**
A tornado crossed the Mississippi River after touching down in the river. As a waterspout, it hit a steamer, driving it into the bridge and docks, dumping people overboard. Although there was much panic, there were no injuries. Several barns were destroyed, and 15 homes and two factories were unroofed or damaged as the tornado passed through the west part of Alton.								
3/19/1912	1040 am	**F2**	22	100	0	20	n/a	**G**
Formed 4 miles S of New Douglas and then moved into Bond County.								
3/28/1924	945 pm	**F2**	1.5	50	0	2	$90,000	**G**
Moved NE across Alton. Many homes unroofed or torn apart.								
9/29/1927	1250 pm	**F3**	12	600	7	n/a	$3,000,000	**G**
Tornado formed in St. Louis and caused extensive damage and death before crossing the river into Granite City. In Illinois, 1 death occurred in a home and 6 others occurred as crucible of molten metal was overturned. Debris was carried 50 miles. Probably **F4**. Damage and deaths list are for Illinois. Total deaths for this tornado were 79 and total injuries 550. A recent study by Brooks and Doswell (2001) indicated when the damage is adjusted for inflation and wealth in 1997 dollars, this is the second costliest tornado in U.S. history ($1.7 billion realistic).								
3/30/1938	553 pm	**F3**	53	300	0	10	>$150,000	**G**
Developed near St. Charles MO and passed through the N side of Alton, before moving into Macoupin County. Losses at Alton were $150,000 as 40 buildings were torn apart, causing 10 injuries.								
3/30/1938	645 am	**F3**	7	500	0	3	n/a	**G**
Formed near Glen Carbon and moved NNE, passing 5 miles S of Edwardsville, and ending 3 miles E of that town. One large brick farmhouse was destroyed. That home was also destroyed in 1883. Other homes were unroofed. Barns and a tavern were destroyed.								
3/2/1940	330 pm	**F2**	4	35	0	0	$10,000	**G**
Moved through the east and north parts of Alton, unroofing 12 homes. Many others were shifted off their foundations. A total of 750 buildings sustained damage to some degree.								

3/19/1948	630 am	**F4**	28	400	5	n/a	n/a	**G**
Tornado formed near Alton and moved NE through Fosterburg before moving into Macoupin County. The tornado killed 5 people and destroyed 45 homes in Fosterburg, about half of the village. The tornado killed a total of 33 people and injured 449. Total damage was $3,600,000.								
5/21/1949	450 pm	**F4**	30	600	5	n/a	n/a	**G**
Tornado formed near Florissant, MO and moved ENE, striking Wood River and the north edge of Roxanna. The worst damage was in Wood River were the 5 deaths occurred. **F2** damage occurred at Livingston and Worden. This tornado produced a total of $1,500,000 and injured 55 people.								
1/3/1950	1110 am	**F3**	3	100	0	0	n/a	**SPC, G**
Formed over Spanish Lake, MO and moved NE, striking Hartford and Roxana. Three homes were destroyed and 11 homes were damaged at Roxana. Total damage from the tornado was $300,000.								
12/2/1950	300 pm	**F2**	19	50	0	0	n/a	**SPC, G**
Formed near Fosterburg and moved ENE, striking 2 miles W of Dorsey and 2 miles N of Prairietown before turning NE into Macoupin County.								
12/2/1950	400 pm	**F3**	18	200	n/a	n/a	n/a	**SPC, G**
Formed near Highland and moved ENE into Bond county where maximum intensity was reached. This tornado killed a total of 2 people, injured 25, and caused $550,000 of damage.								
10/6/1955	445 pm	**F1**	15	50	0	2	n/a	**SPC**
12/18/1957	320 pm	**F2**	1	n/a	0	1	n/a	**SPC, G**
Nine buildings were damaged or destroyed on the south side of Wood River.								
5/3/1958	300 pm	**F1**	1	10	0	0	n/a	**SPC**
5/3/1958	330 pm	**F2**	5	10	0	1	n/a	**SPC, G**
A barn was destroyed just NW of Godfrey								
6/1/1958	1230 am	**F2**	0.5	100	0	0	n/a	**SPC**
2/10/1959	215 am	**F1**	n/a	n/a	0	0	n/a	**SPC, G, SD**
Tornado caused extensive (**F4**) damage and 10 deaths in St. Louis before crossing the Mississippi River near the McKinley Bridge Some factory damage was reported in the Venice-Granite City area.								
10/10/1959	515 pm	**F2**	49	50	0	0	>$50,000	**SPC, SD**
A tornado caused heavy damage to a farmstead near Fosterburg with lighter damage N of Alton and in Fosterburg. Collapse of a dairy barn killed 18 cows.								
2/9/1960	835 pm	**F1**	n/a	n/a	0	2	>50,000	**SPC, SD**
One or more tornadoes moved toward the ENE. Wrecked 8 house trailers and loosened roofs of other buildings at Troy. Two minor injuries in the only occupied trailer.								
6/16/1960	200 pm	**F0**	n/a	n/a	0	0	>$500	**SPC, SD**

Ripped shingles from a garage, uprooted trees, and felled powerlines at Wood River.								
6/22/1960	730 pm	**F0**	n/a	n/a	0	0	>$500	**SPC, SD**
Small tornado unroofed a barn, uprooted trees, and damaged buildings at Poag.								
6/30/1960	100 am	**F2**	17	n/a	0	0	$5,000,000	**SPC, SD**
Tornado formed near Bethalto and moved SE, destroying 3 hangars. Forty eight aircraft were destroyed or damaged estimated at near $1,000,000 in damage. Seven house trailers were overturned totaling $35,000 in damage. At Bunker Hill, 8 persons were injured after being hit by flying debris. A mother and 4 children were injured at Godfrey when their house was hurled off its foundation.								
5/16/1967	430 pm	**F1**	0.5	20	0	0	>$500	**SPC, SD**
Damage to a silo and some small buildings.								
6/20/1967	415 pm	**n/a**	0.8	20	0	0	>$500	**SPC, SD**
Six houses damaged near Mitchell.								
6/14/1970	535 pm	**F1**	1.5	50	0	0	n/a	**SPC, SD**
Houses in Mitchell received minor structural damage. A truck camper near one house was blown 100 yards to the N, reportedly after being lifted 300 feet in the air. Chain was broken which tied a dog to a porch post and dog's body was bound 1 mile to NNE. Wheat in field to N twisted in circular pattern. Witnesses reported seeing two funnels, one small one stayed aloft. At about the same time a pickup truck-camper on I-270 was blown over with only minor injuries to 7 occupants. A larger truck just ahead was blown into the ditch.								
6/17/1973	100 am	**F0**	n/a	n/a	0	0	n/a	**SPC, SD**
Tornado ripped off the roof in Granite City.								
7/29/1973	1030 pm	**F2**	n/a	n/a	0	0	>$5,000	**SPC, SD**
Tornado produced mild damage to a shopping center and destroyed a mobile home in Pontoon Beach.								
8/10/1974	125 pm	**F0**	n/a	n/a	0	0	$0	**SPC, SD**
Tornado reported between Worden and Alhambra and caused no damage.								
7/28/1976	445 pm	**F3**	n/a	n/a	0	0	>$5,000	**SPC, SD**
A tornado struck a farm at Grantfork destroying a barn and a machine shed and threw the debris into a nearby field.								
4/10/1978	130 pm	**F1**	0.5	100	0	0	>$50,000	**SPC, SD**
A small funnel cloud developed just SW of the 200 block of Illinois Avenue of South Roxana and moved NE. The funnel apparently dropped down 3 times, with the heaviest losses occurring at a trailer court and a lounge. At the trailer court, a mobile home was overturned and destroyed and 3 other mobile homes were moved off their blocks and damaged. The roof of the Sports Beat Lounge was blown off and the roof of the Shell Oil canning plant was damaged. Also affected by the vicious winds were a pickup and camper shell damaged, 2 large trees uprooted, and several limbs knocked off other trees. Of the damaged mobile								

homes, all but 2 were tied down by either over-the-top metal straps, anchors to the frame, or both. The mobile home that was destroyed had both anchors and straps on the front and rear.

4/3/1981	1050 pm	**F4**	15	567	0	32	>$5,000,000	**SPC, SD**

A tornado traveled 15 miles in a NNE path that was intermittent. The tornado struck the eastern portion of Granite City at about 10:55 pm destroying 7 homes and damaging 24 others. A few mobile homes were destroyed in Granite City and about 20 more in Pontoon Beach. At one location, a pair of hand hedge trimmers were lifted from a yard and driven into the top of a telephone pole. A closed garage nearby buckled out and was destroyed and a top of a tree was sheared off. A car overturned and another was completely turned around while being driven. The tornado then lifted and touched down 1 mile east of the intersection of I-270 and I-57 where 2 tractor trailers were overturned. It lifted again and traveled into Edwardsville. Many homes and business buildings were damaged or destroyed. A transformer was blown about 1/2 block and there were a number of cases where boards and limbs were driven through walls and windshields. Pieces of linoleum were driven underneath the molding that was over a vinyl roof of a car. The tornado finally lifted for the last time on the north edge of town.

4/22/1981	556 pm	**F0**	6	50	0	0	>$500	**SPC, SD**

A tornado was sighted by the Sheriff 8 miles N of Alton. A HAM radio operator observed a tornado at Godfrey, 2 miles N of Alton. Two funnels were also reported east of Fosterburg. Damage to 2 homes was reported, power lines were downed.

5/1/1983	723 pm	**F3**	15	1000	0	3	>$5,000,000	**SPC, SD**

A tornado, crossing the Mississippi River from MO, traveled 15 miles through Granite City to Edwardsville and lifted at Route 157, north of I-270. Six mobile homes were destroyed at the Edwardsville Estates Mobile Home Park and 10 others were damaged. Roof, building, and tree damage was also reported. Two shopping centers and a 2 block area were badly damaged in Granite City and a few trees uprooted.

4/3/1984	535 pm	**F0**	0.1	n/a	0	0	>$5,000	**SPC, SD**

A tornado caused minor damage to homes in Collinsville.

11/15/1988	1028 pm	**F3**	9	200	0	0	$1,000,000	**SPC, SD**

A strong tornado first touched down about 3 miles N of Fairview Heights near Bethel Mine Road and then proceeded NE and moved just E of Collinsville, crossing at the intersection of Kirsch and Liberty Roads and then moved to the SE side of Troy. Nineteen structures were destroyed in Collinsville and Troy. The tornado knocked down 3 steel transmission power line towers just to the SW of Troy. The last report of damage was at 213 East U.S. Route 40 where part of a roof was ripped off a house. The most severe damage occurred near touch down in St. Clair County.

5/12/1990	445 pm	**F1**	6	100	0	0	>$50,000	**SPC, SD**

A tornado touched down near New Douglas then skipped NE for about 6 miles. Many homes were damaged and outbuildings were destroyed along a path that paralleled the Union Pacific Railway into rural Bond County. A large machine shed, 60 x 126 ft was destroyed.

6/8/1993	430 pm	**F0**	0	90	0	0	$50,000	**SD**
4/13/1998	505 pm	**F1**	10	75	0	0	$800,000	**SD**

The same thunderstorm that produced a tornado in St. Louis County produced another in Madison County from Granite City to Edwardsville. The tornado first caused damage on the northwest side of Granite City at the Nameoki Trailer Park where 5 mobile homes were damaged by downed trees. The tornado moved northeast to Pontoon Beach where about 6 homes suffered roof damage. The tornado weakened, but gained strength again and caused damage on the south side of Edwardsville, primarily at the intersection of Center Grove, Goshen, and Troy roads. Several businesses suffered roof damage in this area; among them a floor covering store, an auto body shop, and the Moose Lodge. A nearby daycare also suffered minor roof damage.

6/14/1998	510 pm	**F0**	1	100	0	0	$0	**SD**

The Illinois State Police reported a short lived tornado east of Livingston in open farmland. Trees were uprooted in the area but there was no other damage. A storm chaser photographed the tornado, which quickly became rain-wrapped and dissipated. However, the storm produced a damaging tornado a few minutes later that moved into Bond County, IL.

6/14/1998	515 pm	**F0**	1	75	0	0	n/a	**SD**

A damaging tornado occurred in Madison and Bond counties in southwest Illinois, starting about 615 pm in Madison County just east of New Douglas and moving east into Bond County. This tornado has an almost continuous damage path of nearly 6 miles and a maximum width of 150 yards. Four mobile homes in far northwest Bond County near the Gilmore community were destroyed with 4 people suffering minor injuries. Two farm houses sustained roof damage and 4 farm implement buildings were also destroyed. Numerous trees were also downed along the path.

2/27/1999	1205 pm	**F0**	0	50	0	0	$0	**SD**

Law enforcement and several spotters reported a small tornado just northwest of Troy near the intersection of I-270 and I-55/70. The tornado was brief, formed in an open field and did no damage.

4/18/1999	918 pm	**F1**	1	75	0	1	n/a	**SD**

A small non-super cell tornado associated with a line of thunderstorms caused 1 injury and damage to 3 farms New Douglas area. Most of the damage was to barns and outbuildings. One home had the roof and a couple of walls of an addition blown away. The garage was also severely damaged. One man suffered cuts and bruises when hit by flying debris.

4/10/2001	835 pm	**F1**	2	100	0	1	$5,000,000	**SD**

The 6th and last tornado spawned by the Heavy Precipitation Super cell that moved across the NWS St. Louis, County Warning Area, formed on the east side of Granite City and moved east into south Pontoon Beach. The tornado first damaged an apartment complex near Worthen Park. Two buildings were destroyed with 4 others suffering major to minor damage. Several cars in the parking lot were damaged by flying debris. One person was injured by flying glass. The tornado caused intermittent damage as it moved east across the Legacy Golf Course. Trees were downed and 3 homes suffered roof damage. In southern Pontoon Beach, one house was destroyed as the attached garage was blown away and the entire roof blown off. About 20 other homes/b businesses were damaged before the tornado dissipated.

5/31/2001	208 pm	**F0**	0	50	0	0	$50,000	**SD**

A small tornado formed near Highland High School causing minor damage, but a lot of shook

up people. The tornado passed over the school gymnasium ripping 6 air conditioner units off their bases. Minor damage also occurred to the roof of the gym and to the ceiling of the second story classrooms. The tornado then crossed Route 160 causing some minor damage to farm outbuildings.								
5/30/2004	305 pm	**F1**	2	70	0	0	n/a	**SD**
A tornado initially formed near the intersection of Highway 4 and Fruit Road where several trees were damaged. The tornado moved northeast and caused minor roof damage to a couple of homes and more extensive damage to several farm buildings for about 2 miles. Sheet metal from one roof flew at least one-quarter mile.								
7/5/2004	742 pm	**F0**	0	40	0	0	$0	**SD**
Local law enforcement reported a brief tornado in an open field east of Edwardsville.								
8/24/2004	115 pm	**F0**	1	50	0	0	n/a	**SD**
A small tornado caused a 1 1/4 mile damage path in northeast Alton. Trees were downed at a golf course and a shoe store suffered roof damage.								

***Sources**	**BD** - Brooks, H. E, and C. A. Doswell: 2001: Normalized Damage from Major Tornadoes in the United States: 1890-1999. *Wea. Forecasting,* **16**, 168-176. **G** - Grazulis, T. P., 1993: **Significant Tornadoes 1680-1991. A Chronology and Analysis of Events***.* Environmental Films, Tornado Project, St. Johsnbury, VT. **SD** - National Oceanic and Atmospheric Administration, 1959-2000: *Storm Data*. Vols. 1-42, Nos. 1-12, National Climatic Data Center, Asheville, NC. **SPC** - Storm Prediction Center Database

Attachment "H"
Earthquake Hazard Map

Seismic Hazard of the United States

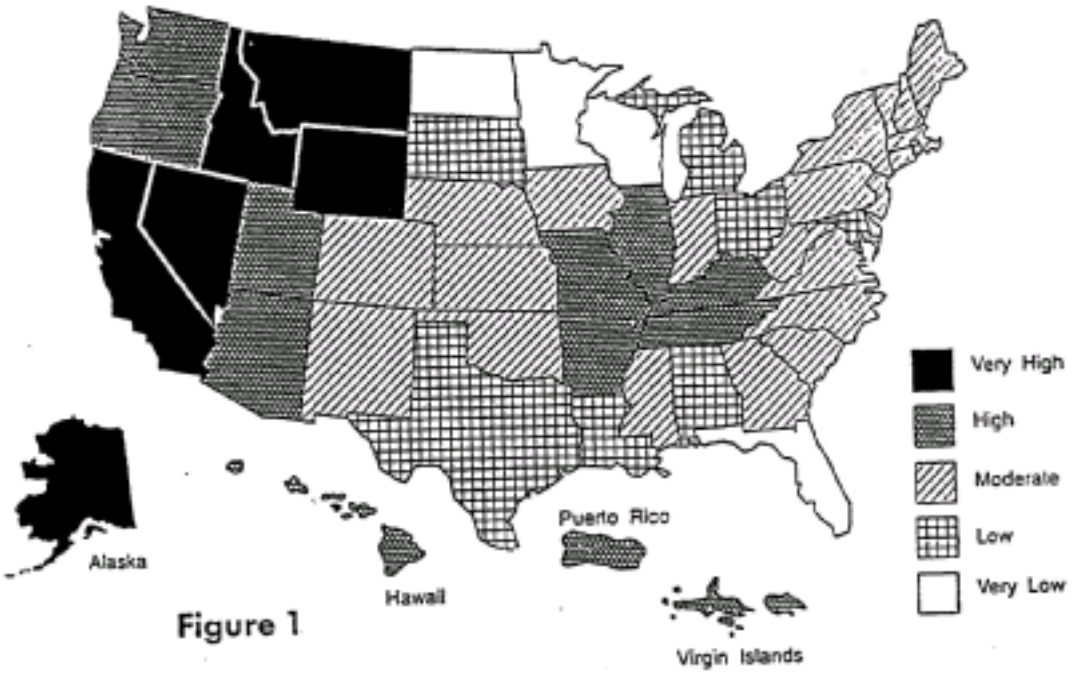
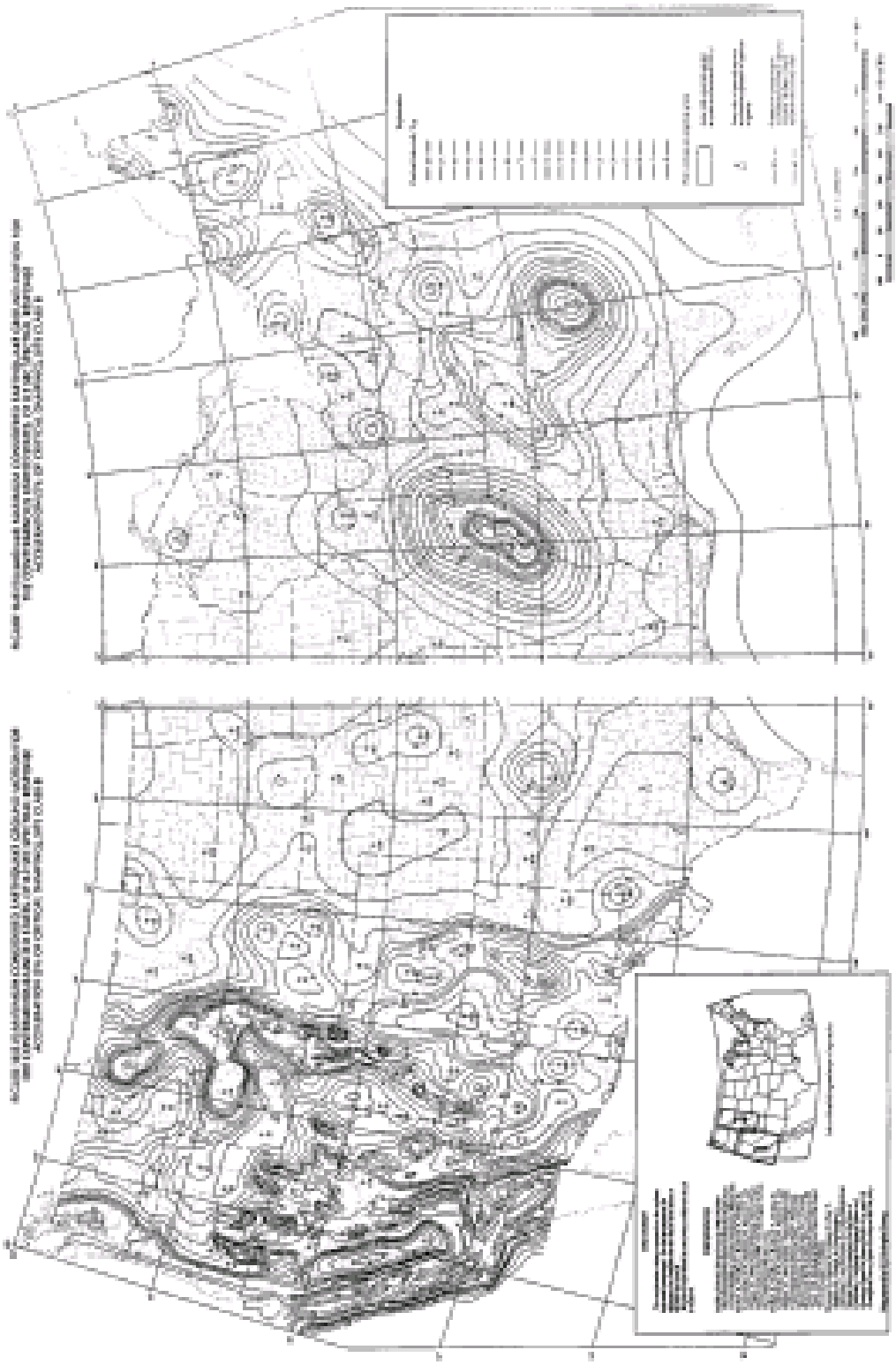


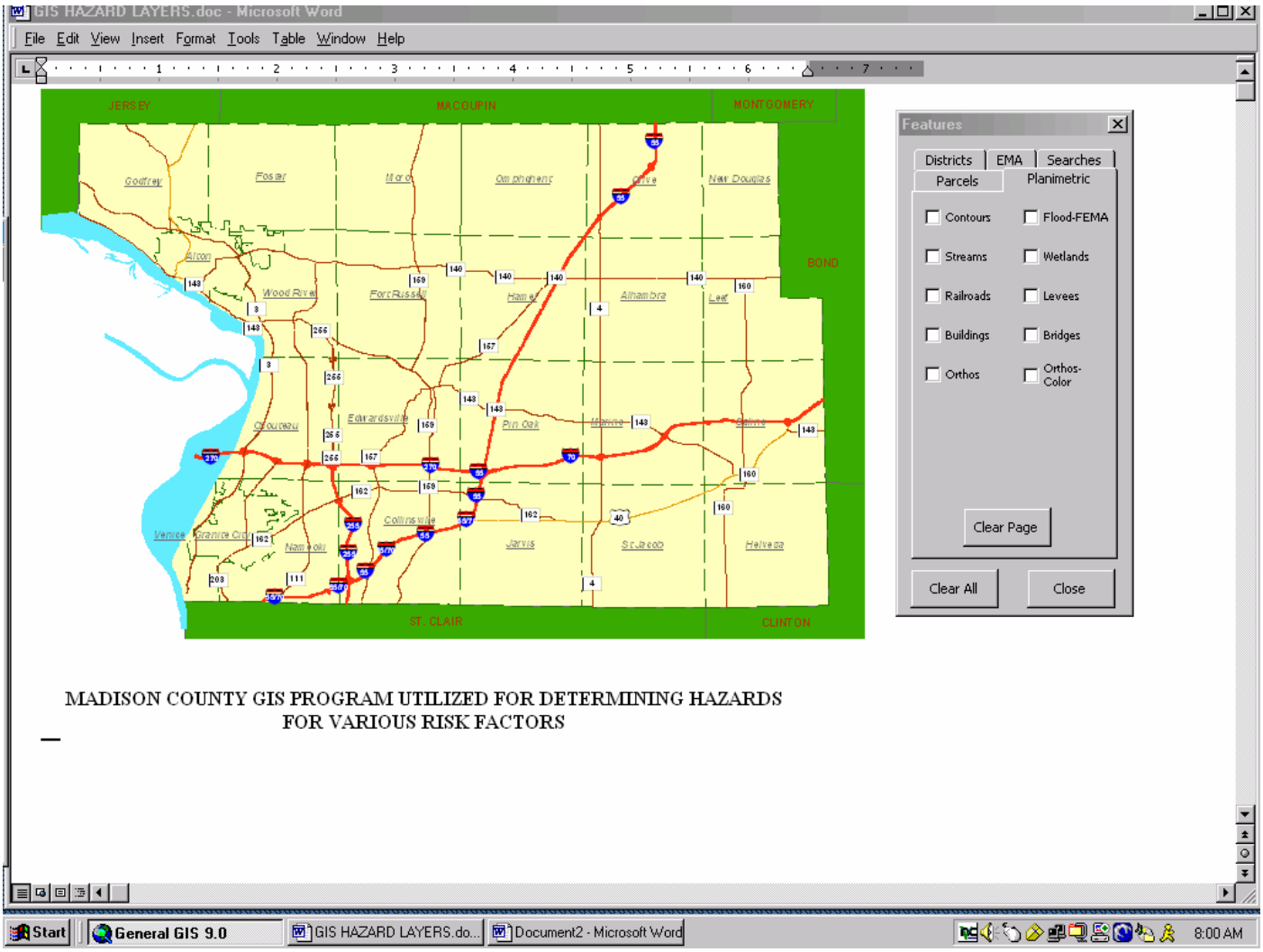
Figure 1

Areas of Equivalent Earthquake Damage

Attachment "I"
Earthquake Zone Map

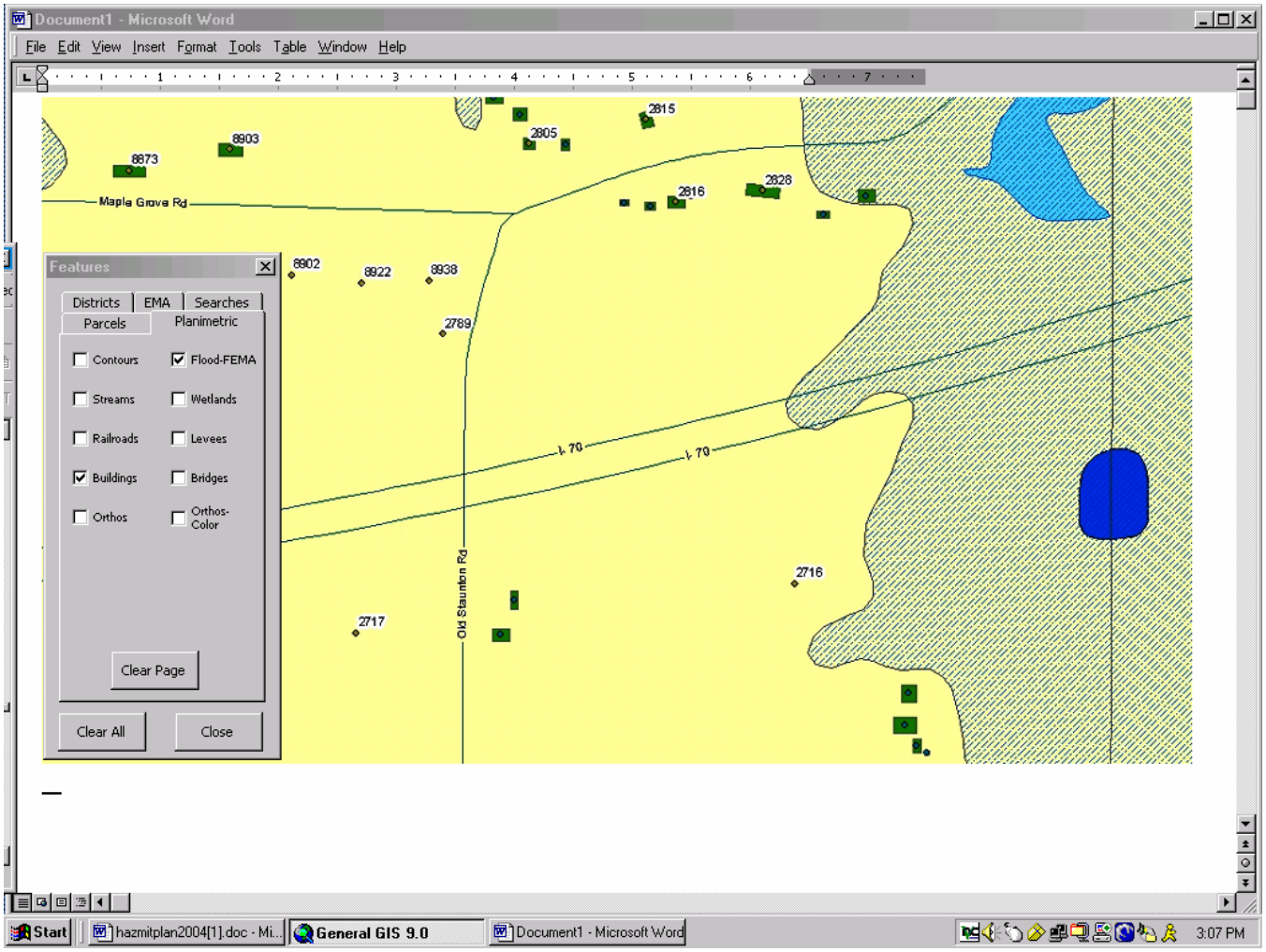


Attachment "J-1"
Madison County GIS Risk Assessment Program



Attachment "J-2"

GIS Program Used to identify structures in Flood Hazard Area



Attachment "K"
Inventory of Assets

Flood	**Number of Structures**			**Value of Structures**			**Number of People**		
Type of Structure	***Madison County***	***# in Hazard Area***	***% in Hazard Area***	***$ value in Madison County (millions)***	***$ value in Hazard Area (millions)***	***% in Hazard Area***	***# in Madison County***	***# in Hazard Area***	***% in Hazard Area***
Residential	102,394	2647	2.6%	$7,934.4	$70.7	0.9%	258,941	N/A	N/A
Commercial	22,932	225	1.0%	$1,480.7	$107.2	7.2%	N/A	N/A	N/A
Industrial	324	20	6.2%	$451.0	$16.6	3.7%	N/A	N/A	N/A
Agricultural	4394	70	1.6%	$100.9	$5.9	5.8%	N/A	N/A	N/A
Religious/Non-profit	714	9	1.3%	$34.0	$.3	.8%	N/A	N/A	N/A
Government	897	43	4.8%	$27.4	$.9	3.4%	N/A	N/A	N/A
Education	519	2	.4%	$12.7	$0	0%	N/A	N/A	N/A
Other	135,335	1,112	.8%	$1,500.0	$12.4	.8%	N/A	N/A	N/A
Critical Facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Infrastructure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	267,509	4,128	1.5%	$11,541.0	$213.9	1.9%	258,941	N/A	N/A

Severe Weather	**Number of Structures**			**Value of Structures**			**Number of People**		
Type of Structure	***Madison County***	***# in Hazard Area***	***% in Hazard Area***	***$ value in Madison County (millions)***	***$ value in Hazard Area (millions)***	***% in Hazard Area***	***# in Madison County***	***# in Hazard Area***	***% in Hazard Area***
Residential	102,394	102,394	100%	$7,934.4	$7,934.4	100%	258,941	258,941	258,941
Commercial	22,932	22,932	100%	$1,480.7	$1,480.7	100%	N/A	N/A	N/A
Industrial	324	324	100%	$451.0	$451.0	100%	N/A	N/A	N/A
Agricultural	4394	4394	100%	$100.9	$100.9	100%	N/A	N/A	N/A
Religious/Non-profit	714	714	100%	$34.0	$34.0	100%	N/A	N/A	N/A
Government	897	897	100%	$27.4	$27.4	100%	N/A	N/A	N/A
Education	519	519	100%	$12.7	$12.7	100%	N/A	N/A	N/A
Other	135,335	135,335	100%	$1,500.0	$1,500.0	100%	N/A	N/A	N/A
Critical Facilities	N/A	N/A	100%	N/A	N/A	100%	N/A	N/A	N/A
Infrastructure	N/A	N/A	100%	N/A	N/A	100%	N/A	N/A	N/A
Total	267,509	267,509	100%	$11,541.0	$11,541.0	100%	258,941	258,941	258,941

Earthquake	Number of Structures			Value of Structures			Number of People		
Type of Structure	***Madison County***	***# in Hazard Area***	***% in Hazard Area***	***$ value in Madison County (millions)***	***$ value in Hazard Area (millions)***	***% in Hazard Area***	***# in Madison County***	***# in Hazard Area***	***% in Hazard Area***
Residential	102,394	102,394	100%	$7,934.4	$7,934.4	100%	258,941	258,941	258,941
Commercial	22,932	22,932	100%	$1,480.7	$1,480.7	100%	N/A	N/A	N/A
Industrial	324	324	100%	$451.0	$451.0	100%	N/A	N/A	N/A
Agricultural	4394	4394	100%	$100.9	$100.9	100%	N/A	N/A	N/A
Religious/Non-profit	714	714	100%	$34.0	$34.0	100%	N/A	N/A	N/A
Government	897	897	100%	$27.4	$27.4	100%	N/A	N/A	N/A
Education	519	519	100%	$12.7	$12.7	100%	N/A	N/A	N/A
Other	135,335	135,335	100%	$1,500.0	$1,500.0	100%	N/A	N/A	N/A
Critical Facilities	N/A	N/A	100%	N/A	N/A	100%	N/A	N/A	N/A
Infrastructure	N/A	N/A	100%	N/A	N/A	100%	N/A	N/A	N/A
Total	267,509	267,509	100%	$11,541.0	$11,541.0	100%	258,941	258,941	258,941

Other	Number of Structures			Value of Structures			Number of People		
Type of Structure	***Madison County***	***# in Hazard Area***	***% in Hazard Area***	***$ value in Madison County (millions)***	***$ value in Hazard Area (millions)***	***% in Hazard Area***	***# in Madison County***	***# in Hazard Area***	***% in Hazard Area***
Residential	102,394	N/A	N/A	$7,934.4	N/A	N/A	258,941	N/A	N/A
Commercial	22,932	N/A	N/A	$1,480.7	N/A	N/A	N/A	N/A	N/A
Industrial	324	N/A	N/A	$451.0	N/A	N/A	N/A	N/A	N/A
Agricultural	4394	N/A	N/A	$100.9	N/A	N/A	N/A	N/A	N/A
Religious/Non-profit	714	N/A	N/A	$34.0	N/A	N/A	N/A	N/A	N/A
Government	897	N/A	N/A	$27.4	N/A	N/A	N/A	N/A	N/A
Education	519	N/A	N/A	$12.7	N/A	N/A	N/A	N/A	N/A
Other	135,335	N/A	N/A	$1,500.0	N/A	N/A	N/A	N/A	N/A
Critical Facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Infrastructure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	267,509	N/A	N/A	$11,541.0	N/A	N/A	258,941	N/A	N/A

Attachment "L"

POPULATION AND LAND DENSITY – MADISON COUNTY

GEOGRAPHIC AREA	POPULATION	HOUSING UNITS	TOTAL AREA (square miles)	WATER AREA (square miles)	LAND AREA (square miles)	POPULATION DENSITY (per square mile)	HOUSING UNITS (per square mile)
Madison County	258,941	108,942	740.35	15.33	725.02	357.2	150.3
COUNTY SUBDIVISION AND PLACE							
Alhambra township	1,475	535	35.00	0.01	34.99	42.1	15.3
Alhambra village	630	216	0.76	0.01	0.76	834.4	286.1
Remainder of Alhambra township	845	319	34.24	0.00	34.24	24.7	9.3
Alton township	30,496	13,894	16.61	0.96	15.64	1,949.3	888.1
Alton city	30,496	13,894	16.61	0.96	15.64	1,949.3	888.1
Chouteau township	8,010	3,287	29.80	2.33	27.47	291.6	119.7
Edwardsville city (part)	13	5	2.61	0.00	2.61	5.0	1.9
Hartford village (part)	886	405	2.64	0.00	2.64	335.3	153.3
Madison city (part)	0	0	1.09	0.06	1.03	0.0	0.0
Pontoon Beach village (part)	687	268	2.41	0.01	2.40	286.4	111.7
Roxana village (part)	43	17	1.82	0.00	1.82	23.7	9.4
South Roxana village	1,888	809	1.59	0.00	1.59	1,190.0	509.9
Remainder of Chouteau township	4,493	1,783	17.65	2.27	15.38	292.1	115.9
Collinsville township	32,954	14,192	35.72	0.18	35.54	927.1	399.3
Collinsville city (part)	21,803	9,870	10.53	0.01	10.52	2,073.0	938.4
Glen Carbon village (part)	321	115	0.26	0.00	0.26	1,239.8	444.2
Maryville village	4,651	1,816	4.70	0.03	4.67	996.5	389.1
Pontoon Beach village (part)	103	37	2.05	0.11	1.94	53.1	19.1
Troy city (part)	0	0	0.04	0.00	0.04	0.0	0.0
Remainder of Collinsville township	6,076	2,354	18.15	0.02	18.12	335.3	129.9
Edwardsville township	33,731	12,953	35.96	0.40	35.56	948.6	364.3
Edwardsville city (part)	20,869	8,137	10.88	0.19	10.69	1,952.1	761.1
Glen Carbon village (part)	10,100	4,119	7.10	0.04	7.06	1,431.0	583.6
GEOGRAPHIC AREA	**POPULATION**	**HOUSING**	**TOTAL AREA**	**WATER**	**LAND AREA**	**POPULATION**	**HOUSING UNITS**

		UNITS	(square miles)	AREA (square miles)	(square miles)	DENSITY (per square mile)	(per square mile)
Pontoon Beach village (part)	16	6	0.11	0.00	0.11	140.9	52.8
Roxana village (part)	43	14	2.12	0.02	2.10	20.5	6.7
Remainder of Edwardsville township	2,703	677	15.74	0.15	15.59	173.3	43.4
Fort Russell township	7,710	3,228	37.26	0.25	37.00	208.4	87.2
Bethalto village (part)	3,103	1,440	2.13	0.00	2.13	1,454.9	675.2
Wood River city (part)	0	0	0.13	0.00	0.13	0.0	0.0
Remainder of Fort Russell township	4,607	1,788	35.00	0.25	34.75	132.6	51.5
Foster township	4,172	1,608	31.86	0.09	31.76	131.3	50.6
Bethalto village (part)	0	0	0.03	0.00	0.03	0.0	0.0
Remainder of Foster township	4,172	1,608	31.83	0.09	31.74	131.5	50.7
Godfrey township	16,286	6,694	36.17	1.69	34.48	472.3	194.1
Godfrey village	16,286	6,694	36.17	1.69	34.48	472.3	194.1
Granite City township	31,301	14,022	17.17	0.49	16.68	1,876.2	840.5
Granite City city	31,301	14,022	17.17	0.49	16.68	1,876.2	840.5
Hamel township	2,027	772	36.70	0.03	36.67	55.3	21.1
Hamel village	570	242	1.16	0.00	1.16	491.3	208.6
Remainder of Hamel township	1,457	530	35.54	0.03	35.51	41.0	14.9
Helvetia township	8,145	3,298	36.20	0.06	36.14	225.4	91.3
Highland city (part)	6,674	2,786	2.05	0.01	2.03	3,283.0	1,370.5
Remainder of Helvetia township	1,471	512	34.15	0.05	34.10	43.1	15.0
Jarvis township	12,062	4,444	35.82	0.00	35.82	336.8	124.1
Troy city (part)	8,524	3,201	4.06	0.00	4.06	2,097.4	787.6
Remainder of Jarvis township	3,538	1,243	31.75	0.00	31.75	111.4	39.1
Leef township	507	193	29.37	0.01	29.37	17.3	6.6
Grantfork village (part)	126	49	0.15	0.00	0.15	836.2	325.2
Remainder of Leef township	381	144	29.22	0.01	29.22	13.0	4.9
Marine township	1,922	749	35.56	0.04	35.53	54.1	21.1
Highland city (part)	0	0	0.04	0.00	0.04	0.0	0.0
Marine village	910	380	0.78	0.02	0.76	1,196.3	499.6
GEOGRAPHIC AREA	POPULATION	HOUSING	TOTAL AREA	WATER	LAND AREA	POPULATION	HOUSING UNITS

		UNITS	(square miles)	AREA (square miles)	(square miles)	DENSITY (per square mile)	(per square mile)
Remainder of Marine township	1,012	369	34.74	0.02	34.72	29.1	10.6
Moro township	3,294	1,290	32.48	0.36	32.12	102.6	40.2
Moro township	3,294	1,290	32.48	0.36	32.12	102.6	40.2
Nameoki township	11,186	4,699	24.31	2.72	21.59	518.0	217.6
Collinsville city (part)	5	3	0.70	0.00	0.70	7.1	4.3
Fairmont City village (part)	29	9	0.22	0.00	0.22	129.9	40.3
Madison city (part)	868	442	2.59	0.13	2.46	352.7	179.6
Pontoon Beach village (part)	4,814	2,030	3.89	0.16	3.73	1,290.3	544.1
Remainder of Nameoki township	5,470	2,215	16.91	2.43	14.48	377.8	153.0
New Douglas township	580	260	20.96	0.00	20.96	27.7	12.4
New Douglas village	369	178	1.07	0.00	1.07	345.6	166.7
Remainder of New Douglas township	211	82	19.89	0.00	19.89	10.6	4.1
Olive township	1,746	781	31.51	0.13	31.38	55.6	24.9
Livingston village	825	396	1.07	0.01	1.06	777.5	373.2
Williamson village	251	112	1.56	0.04	1.52	165.4	73.8
Remainder of Olive township	670	273	28.88	0.08	28.80	23.3	9.5
Omphghent township	2,063	866	33.97	0.01	33.95	60.8	25.5
Worden village	905	396	0.66	0.00	0.66	1,370.3	599.6
Remainder of Omphghent township	1,158	470	33.31	0.01	33.29	34.8	14.1
Pin Oak township	2,607	903	36.05	0.10	35.95	72.5	25.1
Edwardsville city (part)	609	189	0.60	0.03	0.57	1,070.2	332.1
Glen Carbon village (part)	4	2	0.10	0.00	0.10	39.9	19.9
Troy city (part)	0	0	0.08	0.00	0.08	0.0	0.0
Remainder of Pin Oak township	1,994	712	35.28	0.07	35.21	56.6	20.2
St. Jacob township	2,102	777	35.93	0.00	35.92	58.5	21.6
St. Jacob village	801	321	0.56	0.00	0.56	1,433.1	574.3
Remainder of St. Jacob township	1,301	456	35.37	0.00	35.36	36.8	12.9
Saline township	4,372	1,705	35.62	1.05	34.57	126.5	49.3
GEOGRAPHIC AREA	**POPULATION**	**HOUSING UNITS**	**TOTAL AREA (square miles)**	**WATER AREA (square**	**LAND AREA (square miles)**	**POPULATION DENSITY (per square**	**HOUSING UNITS (per square mile)**

				miles)		mile)	
Grantfork village (part)	128	54	0.08	0.00	0.08	1,646.7	694.7
Highland city (part)	1,764	824	4.33	1.00	3.33	529.8	247.5
Pierron village (part)	50	19	0.19	0.00	0.19	259.8	98.7
Remainder of Saline township	2,430	808	31.02	0.04	30.97	78.5	26.1
Venice township	6,783	3,289	14.05	3.72	10.34	656.2	318.2
Madison city (part)	3,669	1,876	2.13	0.08	2.05	1,790.4	915.5
Venice city	2,528	1,154	1.87	0.00	1.87	1,348.5	615.6
Remainder of Venice township	586	259	10.05	3.63	6.41	91.4	40.4
Wood River township	33,410	14,503	26.27	0.70	25.57	1,306.5	567.2
Bethalto village (part)	6,351	2,567	4.42	0.00	4.42	1,437.3	580.9
East Alton village	6,830	3,171	5.63	0.13	5.50	1,241.3	576.3
Hartford village (part)	659	305	1.27	0.01	1.26	524.9	242.9
Rosewood Heights CDP	4,262	1,754	2.14	0.00	2.14	1,988.0	818.1
Roxana village (part)	1,461	666	2.88	0.00	2.88	506.9	231.1
Wood River city (part)	11,296	5,001	5.96	0.02	5.93	1,904.8	843.3
Remainder of Wood River township	2,551	1,039	3.97	0.53	3.44	742.0	302.2
PLACE							
Alhambra village	630	216	0.76	0.01	0.76	834.4	286.1
Alton city	30,496	13,894	16.61	0.96	15.64	1,949.3	888.1
Bethalto village	9,454	4,007	6.58	0.00	6.58	1,437.3	609.2
Collinsville city (part)	21,808	9,873	11.23	0.01	11.22	1,944.1	880.1
East Alton village	6,830	3,171	5.63	0.13	5.50	1,241.3	576.3
Edwardsville city	21,491	8,331	14.09	0.22	13.87	1,549.2	600.6
Fairmont City village (part)	29	9	0.22	0.00	0.22	129.9	40.3
Glen Carbon village	10,425	4,236	7.46	0.04	7.42	1,405.5	571.1
Godfrey village	16,286	6,694	36.17	1.69	34.48	472.3	194.1
Granite City city	31,301	14,022	17.17	0.49	16.68	1,876.2	840.5
Grantfork village	254	103	0.23	0.00	0.23	1,112.1	451.0
Hamel village	570	242	1.16	0.00	1.16	491.3	208.6
Hartford village	1,545	710	3.91	0.01	3.90	396.4	182.1
GEOGRAPHIC AREA	**POPULATION**	**HOUSING UNITS**	**TOTAL AREA (square miles)**	**WATER AREA (square**	**LAND AREA (square miles)**	**POPULATION DENSITY (per square**	**HOUSING UNITS (per square mile)**

				miles)		**mile)**	
Highland city	8,438	3,610	6.42	1.02	5.41	1,561.1	667.9
Livingston village	825	396	1.07	0.01	1.06	777.5	373.2
Madison city (part)	4,537	2,318	5.81	0.27	5.54	818.5	418.2
Marine village	910	380	0.78	0.02	0.76	1,196.3	499.6
Maryville village	4,651	1,816	4.70	0.03	4.67	996.5	389.1
New Douglas village	369	178	1.07	0.00	1.07	345.6	166.7
Pierron village (part)	50	19	0.19	0.00	0.19	259.8	98.7
Pontoon Beach village	5,620	2,341	8.46	0.28	8.18	686.9	286.1
Rosewood Heights CDP	4,262	1,754	2.14	0.00	2.14	1,988.0	818.1
Roxana village	1,547	697	6.82	0.02	6.80	227.5	102.5
St. Jacob village	801	321	0.56	0.00	0.56	1,433.1	574.3
South Roxana village	1,888	809	1.59	0.00	1.59	1,190.0	509.9
Troy city	8,524	3,201	4.18	0.00	4.18	2,037.6	765.2
Venice city	2,528	1,154	1.87	0.00	1.87	1,348.5	615.6
Williamson village	251	112	1.56	0.04	1.52	165.4	73.8
Wood River city	11,296	5,001	6.08	0.02	6.06	1,865.2	825.8
Worden village	905	396	0.66	0.00	0.66	1,370.3	599.6

Attachment "M"

HOUSING CHARACTERISTS – MADISON COUNTY

GEOGRAPHIC AREA	TOTAL HOUSING UNITS	MEDIUM ROOMS	% SINGLE FAMILY	% IN 10+ UNIT BUILDINGS	% WITHOUT PLUMGING	% W/O KITCHENS	% BUILT 1990 TO 2000	% BUILT 1939 OR EARLIER
Madison County	108,942	5.3	78.5	4.2	0.6	0.8	13.7	18.5
COUNTY SUBDIVISION AND PLACE								
Alhambra township	528	5.8	92.0	0.0	0.0	0.4	17.4	21.4
Alhambra village	224	5.4	86.2	0.0	0.0	0.0	11.2	27.7
Remainder of Alhambra township	304	6.0	96.4	0.0	0.0	0.7	22.0	16.8
Alton township	13,888	5.1	75.1	4.0	0.8	1.1	5.7	33.3
Alton city	13,888	5.1	75.1	4.0	0.8	1.1	5.7	33.3
Chouteau township	3,276	5.3	83.1	2.9	1.1	1.5	15.2	9.4
Edwardsville city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Hartford village (part)	408	5.0	98.8	0.0	1.0	2.7	1.2	16.9
Madison city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Pontoon Beach village (part)	253	4.5	58.5	26.5	0.0	0.0	75.9	2.4
Roxana village (part)	18	6.9	83.3	0.0	0.0	0.0	16.7	22.2
South Roxana village	806	5.0	85.6	2.6	2.0	3.0	3.8	9.3
Remainder of Chouteau township	1,791	5.6	81.8	0.4	0.8	0.8	15.0	8.7
Collinsville township	14,206	5.4	73.7	5.7	0.4	0.5	16.3	14.5
Collinsville city (part)	9,929	5.2	66.7	7.6	0.6	0.6	12.9	17.9
Glen Carbon village (part)	108	8.2	100.0	0.0	0.0	0.0	56.5	0.0
Maryville village	1,829	5.9	82.8	3.6	0.0	0.2	39.0	5.9
Pontoon Beach village (part)	16	5.0	100.0	0.0	0.0	0.0	100.0	0.0
Troy city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Remainder of Collinsville township	2,324	6.0	94.8	0.0	0.0	0.0	10.6	7.7
Edwardsville township	12,966	5.6	77.1	5.9	0.3	0.3	27.4	16.1
Edwardsville city (part)	8,249	5.5	79.3	7.4	0.4	0.2	23.2	22.6
Glen Carbon village (part)	4,076	5.9	74.7	3.8	0.0	0.3	36.3	4.8

GEOGRAPHIC AREA	TOTAL HOUSING UNITS	MEDIUM ROOMS	% SINGLE FAMILY	% IN 10+ UNIT BUILDINGS	% WITHOUT PLUMGING	% W/O KITCHENS	% BUILT 1990 TO 2000	% BUILT 1939 OR EARLIER
Pontoon Beach village (part)	6	5.0	100.0	0.0	0.0	0.0	0.0	0.0
Roxana village (part)	19	5.4	100.0	0.0	0.0	0.0	26.3	26.3
Remainder of Edwardsville township	616	5.2	62.5	0.0	0.6	0.6	25.2	3.6
Fort Russell township	3,237	5.3	79.1	5.9	0.2	1.1	20.0	9.4
Bethalto village (part)	1,446	4.5	59.3	12.1	0.0	1.8	16.9	10.7
Wood River city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Remainder of Fort Russell township	1,791	5.8	95.1	0.9	0.3	0.4	22.6	8.4
Foster township	1,594	6.2	99.4	0.0	0.4	0.9	17.3	11.5
Bethalto village (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Remainder of Foster township	1,594	6.2	99.4	0.0	0.4	0.9	17.3	11.5
Godfrey township	6,712	5.9	88.8	1.7	0.6	0.7	17.7	5.9
Godfrey village	6,712	5.9	88.8	1.7	0.6	0.7	17.7	5.9
Granite City township	14,130	5.0	75.0	5.9	0.7	1.0	3.2	25.5
Granite City city	14,130	5.0	75.0	5.9	0.7	1.0	3.2	25.5
Hamel township	769	5.7	91.9	0.3	0.5	1.0	23.3	16.3
Hamel village	243	5.6	84.4	0.0	0.0	0.0	16.9	10.3
Remainder of Hamel township	526	5.8	95.4	0.4	0.8	1.5	26.2	19.0
Helvetia township	3,269	5.6	73.8	7.5	0.3	1.0	15.8	18.2
Highland city (part)	2,754	5.3	69.3	8.9	0.3	1.2	14.8	19.4
Remainder of Helvetia township	515	6.4	97.7	0.0	0.0	0.0	21.6	12.0
Jarvis township	4,422	5.9	81.0	2.4	0.5	0.6	29.5	8.6
Troy city (part)	3,129	5.6	74.0	3.5	0.8	0.9	31.4	9.0
Remainder of Jarvis township	1,293	6.5	97.9	0.0	0.0	0.0	24.9	7.7
Leef township	214	5.9	85.0	0.0	0.0	0.0	23.4	32.7
Grantfork village (part)	60	5.2	81.7	0.0	0.0	0.0	10.0	38.3
Remainder of Leef township	154	6.1	86.4	0.0	0.0	0.0	28.6	30.5
Marine township	737	5.6	87.2	1.2	0.3	0.0	9.8	30.7
Highland city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)

GEOGRAPHIC AREA	TOTAL HOUSING UNITS	MEDIUM ROOMS	% SINGLE FAMILY	% IN 10+ UNIT BUILDINGS	% WITHOUT PLUMGING	% W/O KITCHENS	% BUILT 1990 TO 2000	% BUILT 1939 OR EARLIER
Marine village	378	5.3	75.1	2.4	0.5	0.0	6.6	38.6
Remainder of Marine township	359	5.8	100.0	0.0	0.0	0.0	13.1	22.3
Moro township	1,297	6.2	98.1	0.0	0.5	0.0	23.7	14.0
Moro township	1,297	6.2	98.1	0.0	0.5	0.0	23.7	14.0
Nameoki township	4,655	5.2	70.5	0.9	0.4	0.6	16.0	6.3
Collinsville city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Fairmont City village (part)	8	5.5	100.0	0.0	0.0	0.0	0.0	0.0
Madison city (part)	428	5.2	87.4	0.0	0.0	1.6	0.0	30.4
Pontoon Beach village (part)	2,068	5.0	47.6	2.1	0.0	0.0	25.9	3.2
Remainder of Nameoki township	2,151	5.4	89.1	0.0	0.9	1.0	9.7	4.6
New Douglas township	247	5.4	89.1	0.0	0.0	1.2	8.5	36.0
New Douglas village	179	5.5	86.6	0.0	0.0	0.0	3.9	41.9
Remainder of New Douglas township	68	5.3	95.6	0.0	0.0	4.4	20.6	20.6
Olive township	780	5.5	80.6	0.5	0.4	0.8	11.9	36.5
Livingston village	397	5.2	74.3	1.0	0.0	0.0	10.3	37.5
Williamson village	110	5.1	82.7	0.0	2.7	5.5	11.8	49.1
Remainder of Olive township	273	5.9	89.0	0.0	0.0	0.0	14.3	30.0
Omphghent township	869	5.4	88.4	0.1	2.2	3.3	17.8	30.5
Worden village	389	5.1	82.0	0.3	0.8	1.5	10.8	43.2
Remainder of Omphghent township	480	5.7	93.5	0.0	3.3	4.8	23.5	20.2
Pin Oak township	918	6.3	97.7	0.0	0.0	0.0	25.1	6.2
Edwardsville city (part)	204	7.5	100.0	0.0	0.0	0.0	21.6	5.4
Glen Carbon village (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Troy city (part)	0	0.0	(X)	(X)	(X)	(X)	(X)	(X)
Remainder of Pin Oak township	714	6.2	97.1	0.0	0.0	0.0	26.1	6.4
St. Jacob township	757	5.8	88.6	0.0	0.4	0.4	23.8	16.2
St. Jacob village	316	5.5	82.3	0.0	0.9	0.9	14.2	30.7
Remainder of St. Jacob township	441	6.0	93.2	0.0	0.0	0.0	30.6	5.9

GEOGRAPHIC AREA	TOTAL HOUSING UNITS	MEDIUM ROOMS	% SINGLE FAMILY	% IN 10+ UNIT BUILDINGS	% WITHOUT PLUMGING	% W/O KITCHENS	% BUILT 1990 TO 2000	% BUILT 1939 OR EARLIER
Saline township	1,759	5.6	79.1	4.1	0.8	0.3	29.5	16.0
Grantfork village (part)	64	5.2	48.4	0.0	0.0	0.0	17.2	15.6
Highland city (part)	836	5.0	64.4	8.6	1.0	0.0	20.2	22.5
Pierron village (part)	13	6.3	69.2	0.0	0.0	0.0	15.4	15.4
Remainder of Saline township	846	6.1	96.2	0.0	0.7	0.7	39.8	9.6
Venice township	3,224	4.8	68.0	5.9	3.5	3.6	3.2	28.2
Madison city (part)	1,853	4.8	72.7	5.9	1.0	2.3	2.5	29.5
Venice city	1,154	4.8	58.1	6.8	7.0	5.5	3.5	29.8
Remainder of Venice township	217	5.2	80.6	0.0	6.9	4.1	7.4	7.8
Wood River township	14,488	5.0	81.8	3.9	0.5	0.7	4.6	18.0
Bethalto village (part)	2,533	5.3	84.0	1.3	0.0	0.3	14.0	6.1
East Alton village	3,175	4.6	75.6	6.0	0.0	0.7	1.5	22.3
Hartford village (part)	309	4.6	86.1	0.0	1.0	1.0	1.0	35.9
Rosewood Heights CDP	1,777	5.4	95.4	0.0	0.0	0.0	1.7	5.5
Roxana village (part)	668	4.9	88.8	0.0	0.6	1.8	5.4	29.2
Wood River city (part)	5,013	4.9	76.2	6.8	0.9	0.8	2.9	25.7
Remainder of Wood River township	1,013	5.1	93.1	0.0	2.9	1.5	4.9	5.3
PLACE								
Alhambra village	224	5.4	86.2	0.0	0.0	0.0	11.2	27.7
Alton city	13,888	5.1	75.1	4.0	0.8	1.1	5.7	33.3
Bethalto village	3,979	5.0	75.0	5.2	0.0	0.8	15.1	7.8
Collinsville city (part)	9,929	5.2	66.7	7.6	0.6	0.6	12.9	17.9
East Alton village	3,175	4.6	75.6	6.0	0.0	0.7	1.5	22.3
Edwardsville city	8,453	5.5	79.8	7.2	0.4	0.2	23.2	22.2
Fairmont City village (part)	8	5.5	100.0	0.0	0.0	0.0	0.0	0.0
Glen Carbon village	4,184	5.9	75.3	3.7	0.0	0.3	36.8	4.6
Godfrey village	6,712	5.9	88.8	1.7	0.6	0.7	17.7	5.9
Granite City city	14,130	5.0	75.0	5.9	0.7	1.0	3.2	25.5
GEOGRAPHIC AREA	**TOTAL**	**MEDIUM**	**% SINGLE**	**% IN 10+**	**% WITHOUT**	**% W/O**	**% BUILT**	**% BUILT**

	HOUSING UNITS	ROOMS	FAMILY	UNIT BUILDINGS	PLUMGING	KITCHENS	1990 TO 2000	1939 OR EARLIER
Grantfork village	124	5.2	64.5	0.0	0.0	0.0	13.7	26.6
Hamel village	243	5.6	84.4	0.0	0.0	0.0	16.9	10.3
Hartford village	717	4.8	93.3	0.0	1.0	2.0	1.1	25.1
Highland city	3,590	5.2	68.2	8.8	0.5	0.9	16.0	20.1
Livingston village	397	5.2	74.3	1.0	0.0	0.0	10.3	37.5
Madison city (part)	2,281	4.9	75.4	4.8	0.8	2.2	2.0	29.7
Marine village	378	5.3	75.1	2.4	0.5	0.0	6.6	38.6
Maryville village	1,829	5.9	82.8	3.6	0.0	0.2	39.0	5.9
New Douglas village	179	5.5	86.6	0.0	0.0	0.0	3.9	41.9
Pierron village (part)	13	6.3	69.2	0.0	0.0	0.0	15.4	15.4
Pontoon Beach village	2,343	4.9	49.3	4.7	0.0	0.0	31.7	3.1
Rosewood Heights CDP	1,777	5.4	95.4	0.0	0.0	0.0	1.7	5.5
Roxana village	705	5.0	88.9	0.0	0.6	1.7	6.2	28.9
St. Jacob village	316	5.5	82.3	0.0	0.9	0.9	14.2	30.7
South Roxana village	806	5.0	85.6	2.6	2.0	3.0	3.8	9.3
Troy city	3,129	5.6	74.0	3.5	0.8	0.9	31.4	9.0
Venice city	1,154	4.8	58.1	6.8	7.0	5.5	3.5	29.8
Williamson village	110	5.1	82.7	0.0	2.7	5.5	11.8	49.1
Wood River city	5,013	4.9	76.2	6.8	0.9	0.8	2.9	25.7
Worden village	389	5.1	82.0	0.3	0.8	1.5	10.8	43.2

Attachment "N"

Critical Facilities Report Sample

Critical Facility Survey (CFS)
Building Use Codes

Residential

11 Apartment/hotel
12 Dormitory/barracks
13 Row house and duplex
14 Motel/tourist court
15 Condominium
16 Nursing/convalescent home
19 Other residential

Educational

21 Elementary school
22 Junior/senior high or preparatory school
23 College/university
24 Business/professional
25 Correctional school
26 Library or museum
27 Gymnasium
29 Other educational

Religious

31 Church/synagogue
32 Retreat/monastery/convent
33 Church hall/recreation center
39 Other religious

Government/Public Service

41 Hospital
42 Health care clinic
43 Public utility
44 Communications facility
45 Office facility
46 Jail/prison/correctional center
47 Armory/monument/memorial
48 Fire station
49 Other government/public service
4A Post office
4B Police/sheriff station

Commercial

51 Office facility
52 Food store
53 Stores other than food stores
54 Warehouse
55 Bank/financial institution
56 Restaurant/snack bar/cafeteria
57 Building supply/hardware store
59 Other commercial

Industrial

61 Factory/plant/manufacturing center
62 Food processing plant
69 Other industrial

Amusement/Assembly

71 Theater/auditorium
72 Community center
73 Bowling facility
74 Fraternal hall
75 Health club/fitness center
76 Senior citizens center
79 Other amusement/assembly

Transportation

81 Railroad terminal/station
82 Bus terminal/station
83 Airport terminal
84 Airport hanger
85 Marine terminal
86 Automotive repair and storage
87 Automotive sales facility
88 Gasoline service station
89 Other transportation
8A Trucking terminal/warehouse

Miscellaneous

99 Categories not covered above

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Critical Facility Survey (CFS)
Miscellaneous Code Sheet

Occupancy Type

Code	Type
1	Residential
2	Commercial
3	Office
4	Industrial
5	Public Assembly
6	School
7	Government Building
8	Emergency Services
9	Historic Building

Structure Type

Type	Code	Definition
W	1	Wood Frame
S1	2	Steel MRF
S2	3	Braced Steel Frame
S3	4	Light Metal
S4	5	Steel Frame w/Conc Shearwalls
C1	6	Concrete MRF
C2	7	Concrete Shear wall
C3/S	8	Steel/Conc Frame w/URM Infill
PC1	9	Tilt-up Concrete
PC2	10	Pre-cast Concrete Frame
RM	11	Reinforced Masonry
URM	12	Unreinforced Masonry

No. of Persons

Code	Range
1	0
2	1-10
3	11-100
4	100+

Data Confidence

Code	Level
3	Good
2	Fair
1	Poor

County FIPS Codes

County	Code	County	Code	County	Code
Alexander	17003	Jersey	17083	Randolph	17157
Calhoun	17013	Johnson	17087	Richland	17159
Crawford	17033	Lawrence	17101	St. Clair	17163
Edwards	17047	Madison	17119	Saline	17165
Franklin	17055	Massac	17127	Union	17181
Gallatin	17059	Monroe	17133	Wabash	17185
Hamilton	17065	Perry	17145	Washington	17189
Hardin	17069	Pike	17149	Wayne	17191
Jackson	17077	Pope	17151	White	17193
Jefferson	17081	Pulaski	17153	Williamson	17199

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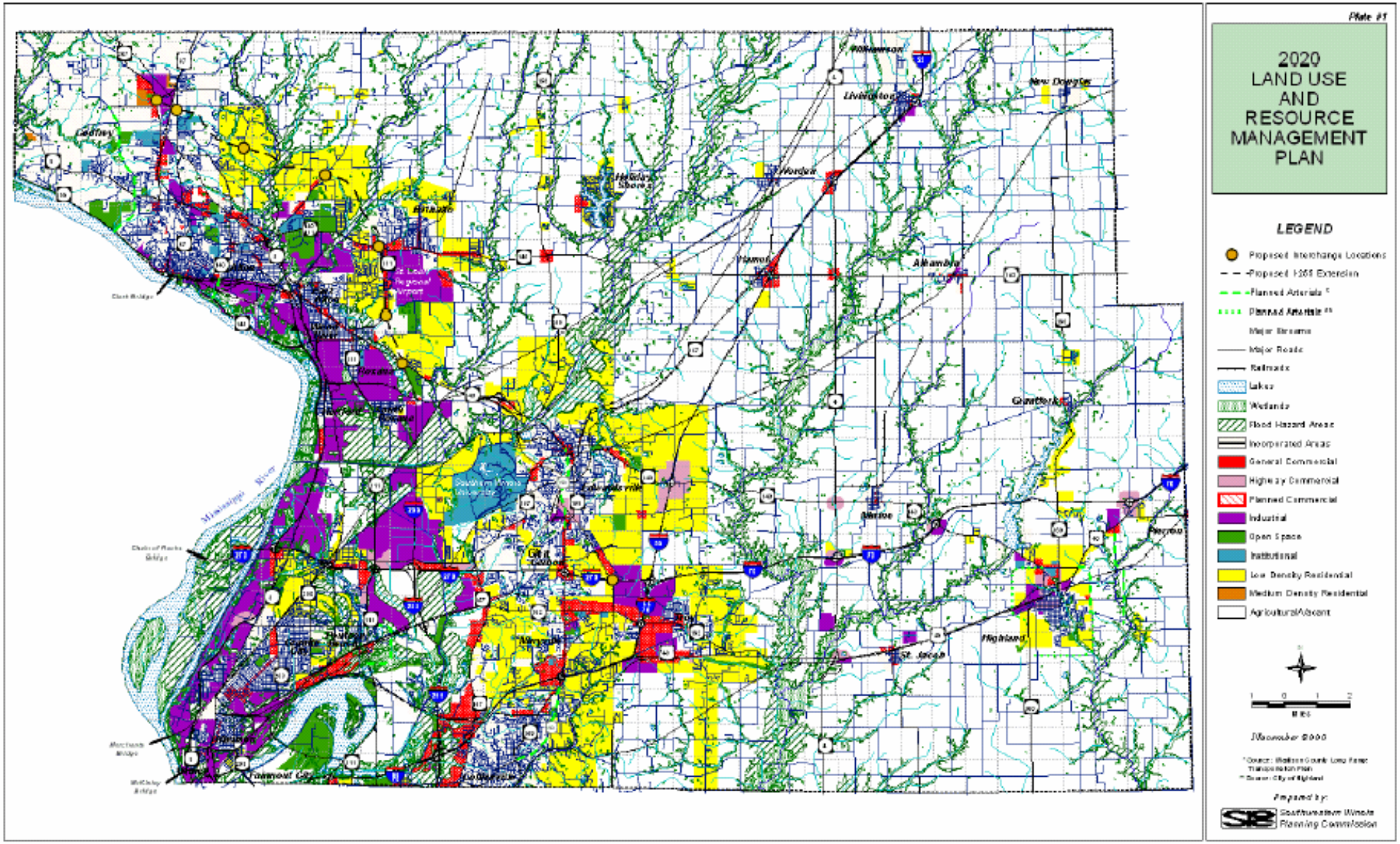
ILLINOIS EMERGENCY MANAGEMENT AGENCY
CRITICAL FACILITY SURVEY
SUMMARY REPORT

 09/14/95

County Name	Building Name / Street Address / Latitude / Year Built / Non-Structural Hazard	Struct. Type / City/Township / Longitude / Inspection Date	# of Stories / Zip Code / Use Code / Occupancy / Final Score	No. of Pers.
MADISON	ALHAMBRA ELEMENTARY SCHOOL		12	1
	500 W. MAIN ST.		ALHAMBRA	62001
	0385312	0894405	21/ 6	4
	1921	07/18/95	-0.6	
	CHIMNEY, GLASS, FLAG POLE ARE FALLING HAZARDS			
MADISON	ALHAMBRA TOWNSHIP BUILDING		1	1
	101 E. MAIN ST.		ALHAMBRA	62001
	0385314	0894354	89/49 7	2
	0985	07/18/95	4.4	
	FLAG POLE IS A FALLING HAZARD			
MADISON	ALHAMBRA VOLUNTEER FIRE DEPT.		12	1
	514 E. MAIN ST.		ALHAMBRA	62001
	0385316	0894335	48/ 7	2
	0950	07/18/95	0.4	
	FLAG POLE, ANTENNA ARE FALLING HAZARDS			
MADISON	FIREMEN AND LEGION HALL		1	1
	300 W. MAIN ST.		ALHAMBRA	62001
	0385311	0894447	74/ 5	2
	0965	07/18/95	4.4	
MADISON	FIRST BAPTIST CHURCH		1	1
	209 E. MAIN ST.		ALHAMBRA	62001
	0385316	0894400	31/ 5	2
	1964	07/18/95	5.4	
	FLAG POLE, BELL TOWER, CHIMNEY ARE FALLING HAZARDS			
MADISON	HAMPTON'S NURSING CARE A		1	1
	417 E. MAIN ST.		ALHAMBRA	62001
	0385325	0894309	16/ 1	4
	1971	07/18/95	4.4	
	ANTENNAE, FLAG POLE ARE FALLING HAZARDS			
MADISON	HAMPTON'S NURSING CARE B		12	1
	417 E. MAIN ST.		ALHAMBRA	62001
	0385325	0894309	16/ 1	4
	1973	07/18/95	0.4	
	ANTENNA, FLAG POLE ARE FALLING HAZARDS			

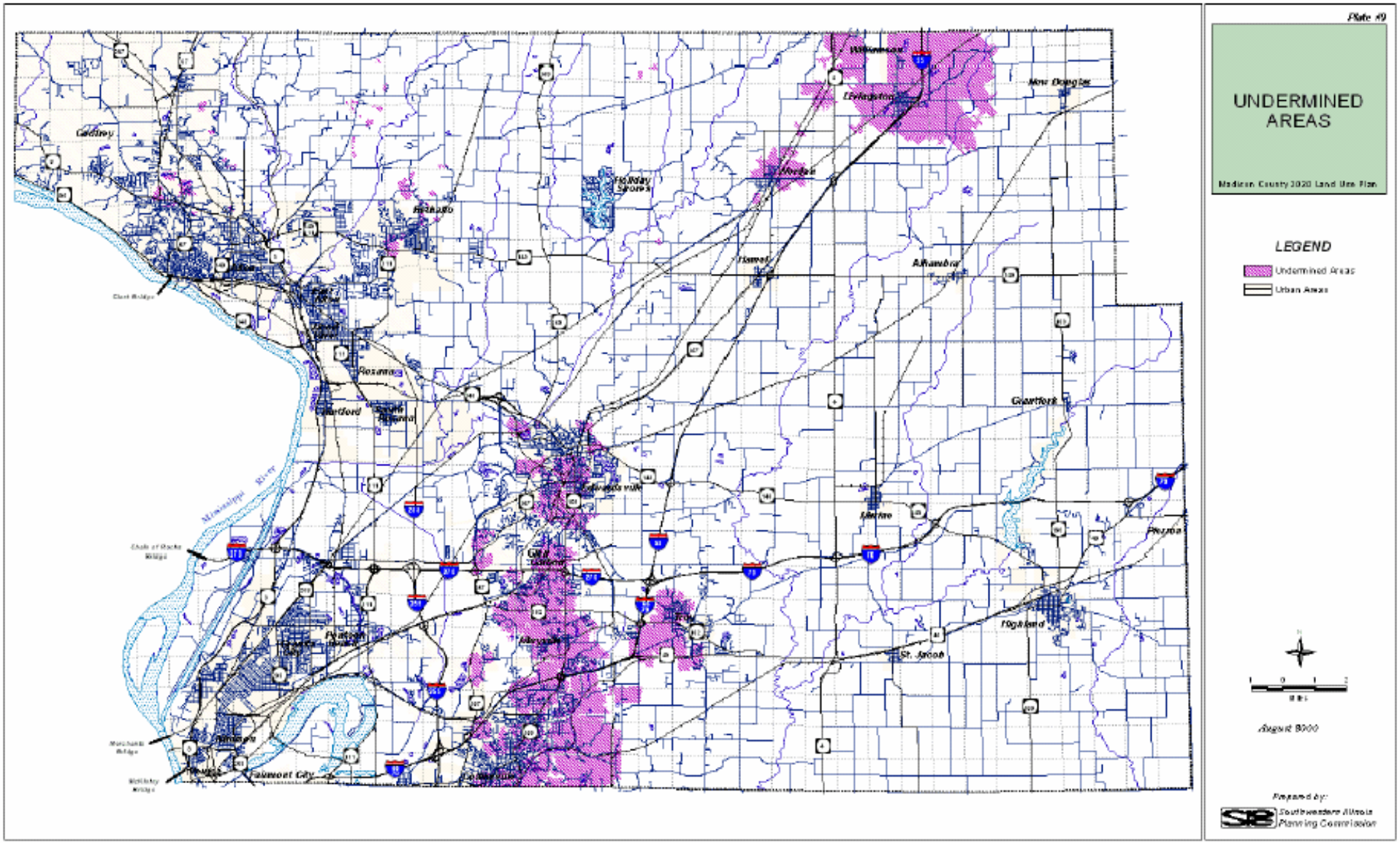
Attachment "O"

2020 Land Use and Resource Management Plan



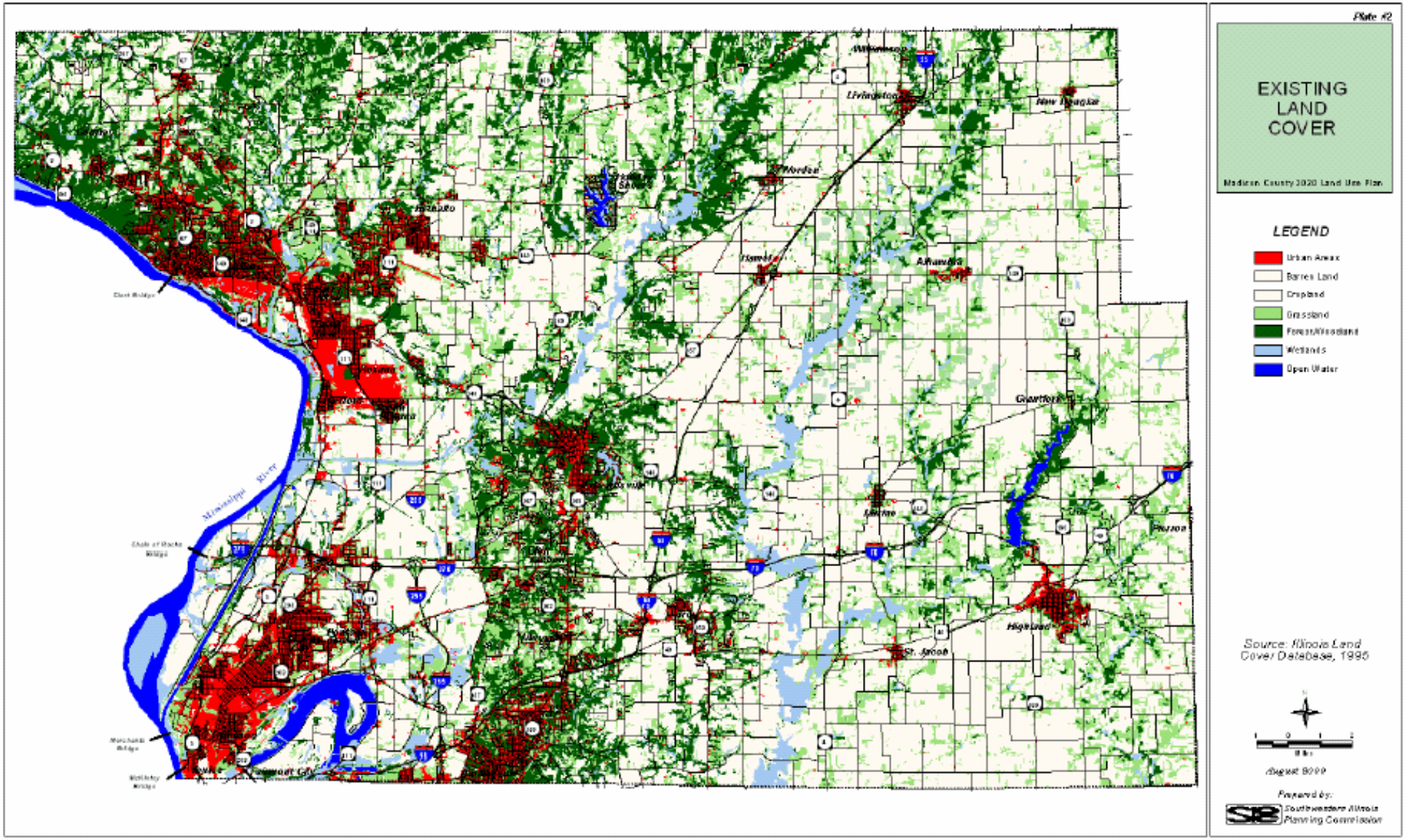
Attachment "P"

Undermined Areas



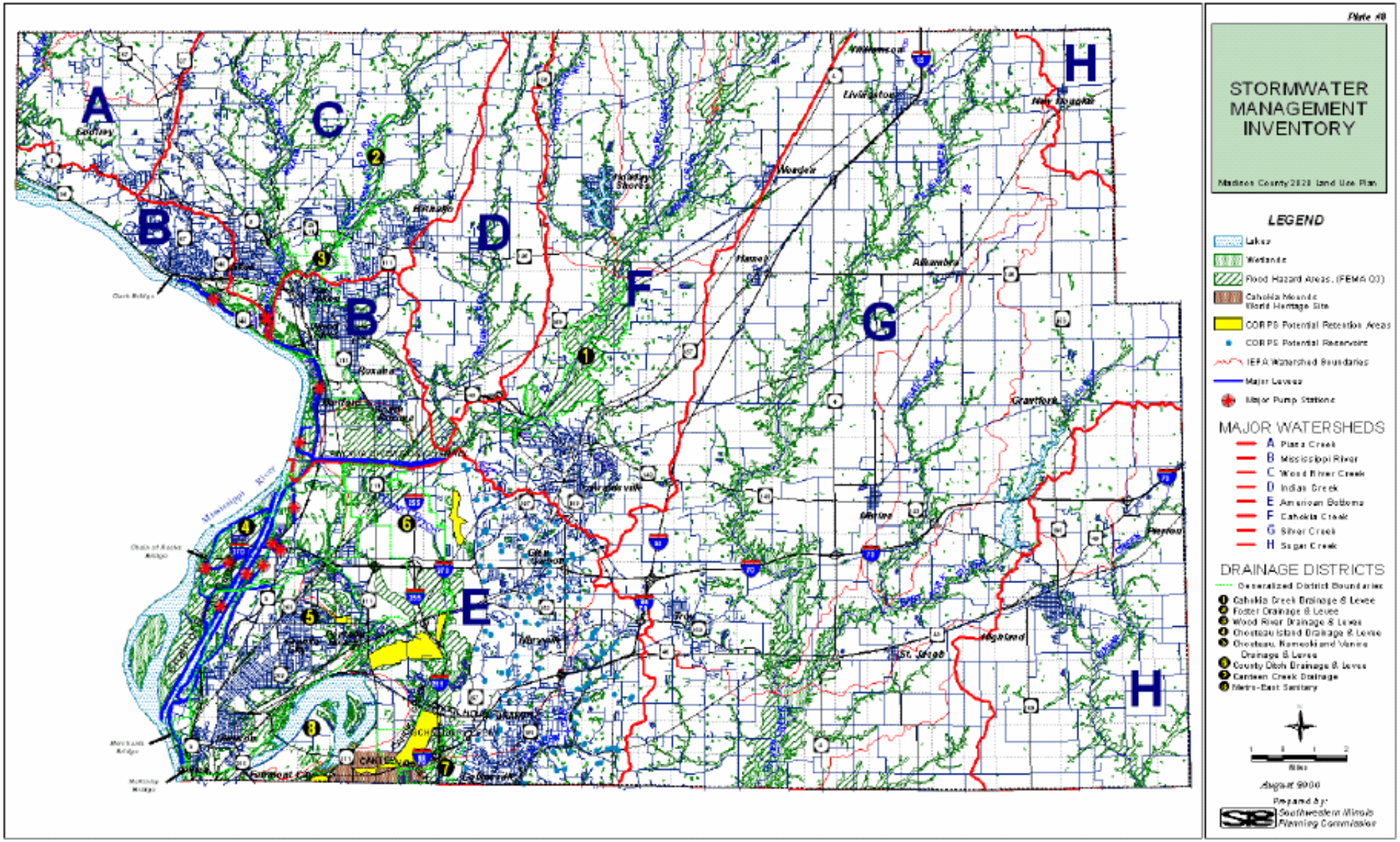
Attachment "Q"

Existing Land Cover



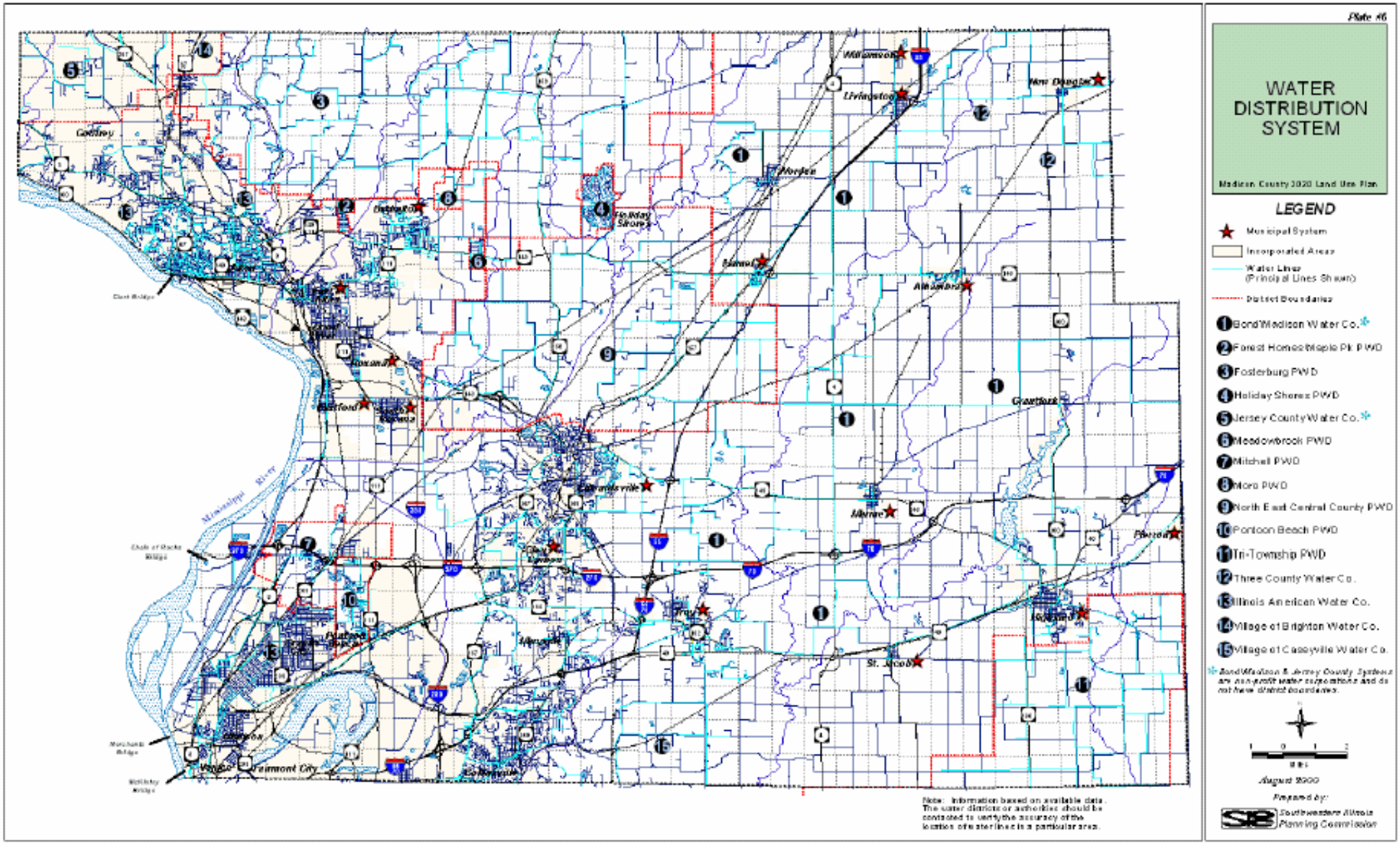
Attachment "R"

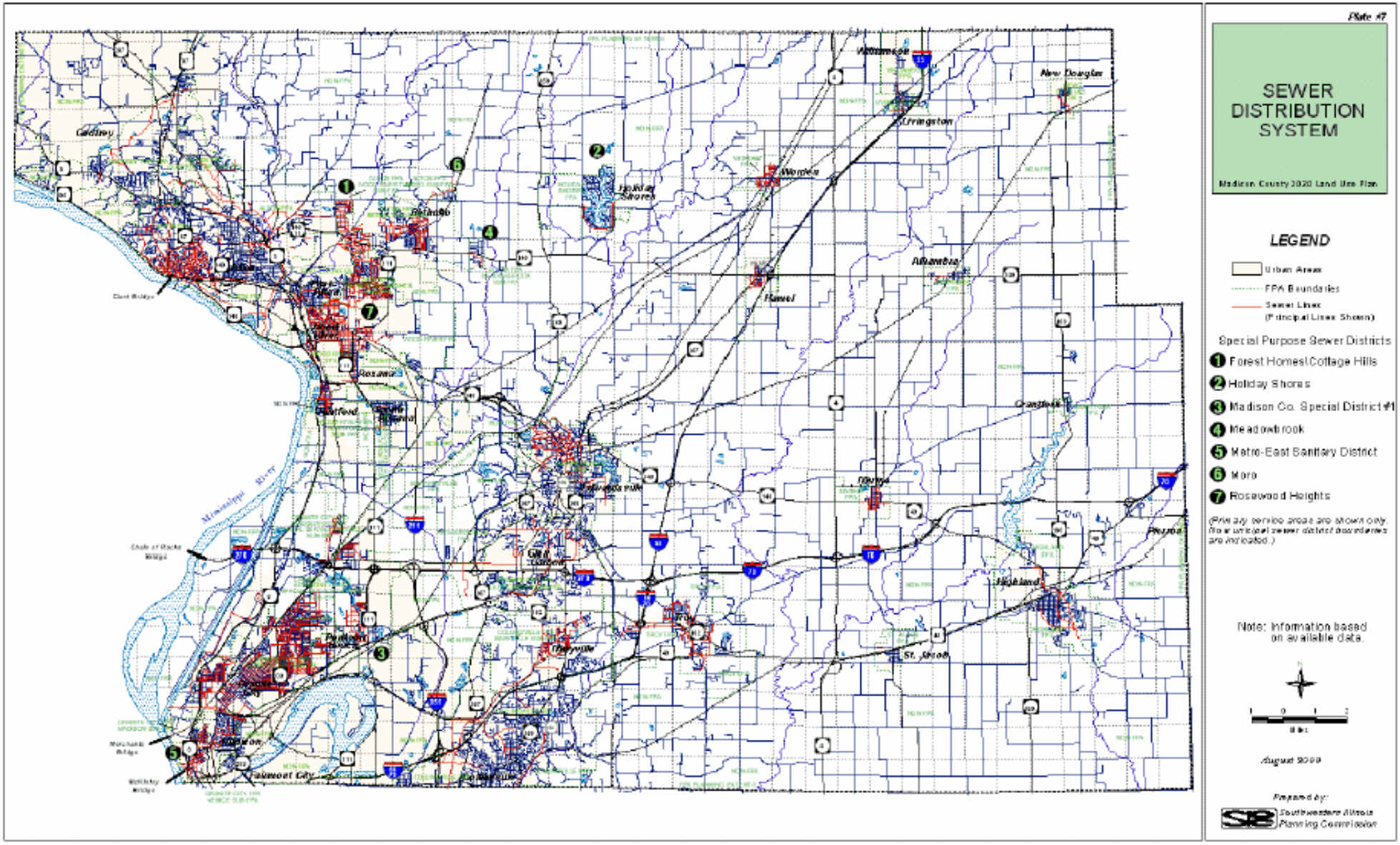
Stormwater Management Inventory



Attachment "S"

Water Distribution Map



Attachment "T"

Sewer Distribution Map