DEPARTMENT OF COMMUNITY DEVELOPMENT SERVICES

Planning Division

m e m o r a n d u m

TO: Laurel Lunt Prussing, Mayor

FROM: Elizabeth H. Tyler, FAICP

DATE: August 13, 2009

SUBJECT: Request by the Zoning Administrator to adopt the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan as an element of 2005 Urbana Comprehensive Plan (Plan Case No. 2114-CP-09)

Introduction

In 2005, the City of Urbana adopted the Hazard Mitigation Plan (copy attached) and amended its new comprehensive plan to make it an element. The Federal Emergency Management Agency (FEMA), in conformance with Federal requirements, has expected Urbana to submit an update in 2010. On February 18, 2008, the Urbana City Council authorized City staff to participate in the development of a County-wide hazard mitigation plan. It is anticipated that the County-wide plan will serve as this update.

The draft Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan was prepared by the Champaign County Regional Planning Commission with input from 27 government jurisdictions. City of Urbana participants included Tony Foster, Fire Division Chief for Prevention and Education, and Robert Myers, Planning Manager. City staff now requests that the City Council adopt the attached County-wide hazard mitigation plan which would supersede the City's 2005 plan.

The Urbana Plan Commission reviewed this request at their August 6, 2009 meeting and voted 6-yes and 0-no to:

1. Approve the Champaign County Hazard Mitigation Plan, and
2. Adopt portions of the plan that pertain to the City of Urbana as an element of the 2005 Urbana Comprehensive Plan.

Background

The Federal Emergency Management Agency offers communities mitigation grant funds following a Presidential disaster declaration. Such grant funds may be used for projects like acquiring flood-prone properties, constructing safe rooms to protect people from tornados, and installing measures to prevent storm water from flowing into sanitary sewer lines and backing up

into basements. The Federal Disaster Mitigation Act of 2000 in fact requires that local jurisdictions have a hazard mitigation plan prior to receiving hazard mitigation funds.

The Federal Emergency Management Agency defines hazard mitigation plans as: "any sustained action to reduce or eliminate the long-term risk to human life and property from hazards." Natural hazard mitigation planning focuses on natural, non-manmade hazards such as severe storms and tornados, winter storms, floods, extreme heat or drought, and earthquakes. As opposed to emergency response plans, hazard mitigation plans are intended as policies which will avoid injury and damage in the first place.

On June 20, 2005, the Urbana City Council adopted our community's own Urbana Hazard Mitigation Plan and made it an element of the newly-approved 2005 comprehensive plan. Formal adoption of the plan made the City eligible for mitigation grant funds for five years, until 2010, at which time it was expected an updated plan would be submitted to FEMA. Plan Case 2114-CP-09 will serve as the required update to Urbana's hazard mitigation plan.

In 2007, the Illinois Emergency Management Agency awarded Champaign County a planning grant to develop a County-wide hazard mitigation plan complying with FEMA's planning criteria. On January 11, 2008, Pius Weibel, Chair of the Champaign County Board, invited the City of Urbana to participate in a County-wide planning process.

Taking a County-wide approach to hazard mitigation planning includes some important benefits, including:

- Making jurisdictions eligible for Federal hazard mitigation funds, in conformance with the Disaster Mitigation Act of 2000;
- Enabling coordinated approaches to mitigate hazards across jurisdictions;
- Allowing cost savings by sharing resources and using economies of scale; and
- Avoiding duplication.

On February 22, 2008, the Urbana City Council adopted Resolution 2008-02-002R (attached) authorizing the City of Urbana to participate in the development of a multi-jurisdictional hazard mitigation plan.

In April 2008, a planning team was formed to guide development of the plan. The planning team included representation from each of the 24 municipal jurisdictions located wholly or partially within Champaign County, as well as the University of Illinois, Parkland College, and Champaign County. Additionally, a broad-based advisory group was formed to advise the planning team. The advisory group included representatives from school districts, hospitals and other service providers, and selected government agency representatives. From April 2008 through May 2009, Champaign County Regional Planning Commission staff, working with the planning team, advisory group, and public input, created the attached draft Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan.

Public outreach was an important component of the plan, including public awareness and opportunities for public input. First, all 24 city and village elected bodies initially passed a resolution approving participation. The public was provided notice of planning team meetings, and press releases were made. Posters informing the public about ways to participate were displayed in public libraries. From December 2008 through January 2009, online public

preference surveys were made available to all participating jurisdictions. A public hearing was also held on June 8, 2009 at a Champaign County Environment and Land Use Committee meeting.

The process has included four major stages:

- Organizing resources
- Assessing risks
- Developing the mitigation plan, and
- Implementing the plan and monitoring progress.

The plan was created under Illinois Emergency Management Agency requirements and guidelines. This included using tools such as HAZUS software to assess the planning areas vulnerability to specific hazards, including predictions of potential building damage and economic loss estimates. (See pages A 3-31 through A 3-33 for Urbana predictions.) Following plan completion, the Federal Emergency Management Agency reviewed and approved the document as meeting their requirements. It is now requested that all participating jurisdictions formally adopt the plan and work on implementing mitigation strategies.

Comprehensive Plan

The 2005 Urbana Comprehensive Plan includes several elements significant for this plan.

Goals and Objectives

Goal 7.0	**Protect and beautify existing waterways**.
Objectives	
7.1	Protect the floodway of the Boneyard Creek.
7.2	Ensure that development regulations protect floodways and major drainageways.
7.3	Redevelop parts of Boneyard Creek to provide natural and public amenities.
Goal 8.0	**Minimize the impact of natural and man-made disasters.**
Objectives	
8.1	Promote construction that reduces the effects of high winds, ice storms, flooding, etc.
8.2	Prepare necessary disaster preparedness measures in order to best protect the community from disasters.
Goal 33.0	**Provide maximum service and dependable utilities.**
Objectives	
33.2	Correct areas of stormwater infiltration-inflow into the sanitary sewer system.
Goal 36.0	**Provide maximum service and dependable utilities.**
Objectives	
36.1	Project life and property from storm and floodwater damage.
36.2	Reduce the impacts of development on stormwater conditions through regulations including appropriate provisions for detention and conveyance.

Implementation Strategies

> Adopt a Hazard Mitigation Plan that offers strategies for reducing the effect of natural disasters. Timing: Near Term
>
> Explore grants and incentives that can be used to encourage relocating existing and future utilities underground.

Urbana Hazard Mitigation Plan

On June 20, 2005, the Urbana City Council amended the City's Comprehensive Plan by adopting as an element a hazard mitigation plan which remains in effect today.

Discussion

Some items pertaining specifically to Urbana include:

- Table 4-1: Number of Structures in HMP Planning Area by General Occupancy Type
- Table 4-5: Number of Critical Facilities by Jurisdiction
- Table 4-22: Summary of Vulnerability to Natural Hazards by Jurisdiction
- Appendix 3: Jurisdiction Specific Vulnerability Assessment for Urbana (pages A 3-31 through A 3-33 of the plan)

Chapter 6 of the draft plan (Mitigation Strategies) includes specific actions each jurisdiction is to complete in order to better manage the community's risks for natural hazards. The following table lists the highest priority mitigation actions identified for Urbana. Please refer to pages 6-23 and 6-24 for the complete list of priorities.

Hazards Addressed	Mitigation Action	Priority
All	1) Complete installation of emergency back up power systems for remaining essential City facilities such as Fire Stations 2 and 3 and the Civic Center. Responsible Party: City of Urbana Public Works and Fire Departments Funding Source(s): federal and local Suggested Timeframe: within two years of FEMA approval of HMP, or as funding permits	1
All	2) Participate in countywide integrated information base for multi-hazard applications. Responsible Party: Champaign County Regional Planning Commission GIS Consortium and City of Urbana Funding Source(s): local Suggested Timeframe: ongoing	1
All	3) Identify existing buildings as shelters. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
All	4) Offer and promote the use of area-wide warning text message system (e.g., Alert Sense.) Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1

SS	5) Maintain an advance outdoor warning siren system Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	6) Use Risk Watch program in schools. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	7) Educate the public--especially seniors and the disabled--on methods to ensure critical documents can be easily retrieved in case of emergency. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
E	8) Periodically review and update International Building Code requirements concerning seismic resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	9) Periodically review and update International Building Code requirements concerning high wind resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
F	10) Provide back up maintenance of storm water detention basins by amending Subdivision Ordinance to require developers to pre-approve a tax benefit district to include properties served by a detention basin in the event that a property owner association fails to maintain it. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	11) Amend the City of Urbana floodplain management regulations to require a minimum of one-foot freeboard above the 100-year floodplain for new construction. Responsible Party: City of Urbana Community Development Services and Public Works Departments Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1

In terms of fiscal impacts to the City, there will be some costs incurred to comply with the plan, but plan adoption will also make the City eligible for hazard mitigation grant funds to both prevent and respond to disasters. In prioritizing the action items, the relative cost versus risk and benefit was taken into account.

Although most of Urbana's mitigation actions will be carried out by the public sector, three implementation strategies deal with revised regulations which will result in future costs for private development. These include periodic City review and update of International Building Code requirements for wind and seismic resistance, and a requirement that newly-constructed buildings be elevated at least one foot above the 100-year flood elevation, as opposed to just being elevated above the 100-year elevation. Simply adopting the Hazard Mitigation Plan will not enact these requirements but will provide direction for future regulatory amendments.

Summary of Findings

1. The draft Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan was prepared pursuant to the Disaster Mitigation Act of 2000 and is consistent with the National Mitigation Strategy developed by the Federal Emergency Management Agency (FEMA).

2. The proposed Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan has been reviewed by FEMA and by the Illinois Emergency Management Agency (IEMA) and has been determined to meet the required criteria.

3. The Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan supersedes and acts as an update to the 2005 City of Urbana Hazard Mitigation Plan.

4. Adoption of the Plan by the City of Urbana will better prepare the City to receive funding assistance from FEMA in the event of a disaster. The Plan will also allow the City to pursue pre-disaster mitigation funds.

5. The proposed Hazard Mitigation Plan is consistent with the Urbana Comprehensive Plan and furthers its goals, objectives, and implementation strategies.

Options

The Urbana City Council has the following options in this case:

1. Approve the Hazard Mitigation Plan and adopt it as an amendment to the Urbana Comprehensive Plan; or
2. Approve the Hazard Mitigation Plan with specific changes and adopt it as an amendment to the Urbana Comprehensive Plan; or
3. Do not approve the Hazard Mitigation Plan.

Recommendation

At its August 6, 2009 meeting, the Urbana Plan Commission voted 6-yes and 0-no to recommend that the City Council:

1. Approve the Champaign County Hazard Mitigation Plan, and
2. Adopt portions of the plan that pertain to the City of Urbana as an element of the 2005 Urbana Comprehensive Plan.

City staff likewise recommends approval.

_____

Prepared by Robert Myers, AICP

cc: Tony Foster, City of Urbana Fire Division Chief, Prevention and Education
Susan Monte, Champaign County Regional Planning Commission

Attachments: A Resolution Authorizing the City to Participate in the Development of a Multi-Jurisdictional Hazard Mitigation Plan (Resolution No. 2008-02-002R)
Champaign County Hazard Mitigation Plan (August 1, 2009 final draft)
Hazard Mitigation Plan, City of Urbana (approved Ord. No 2005-06-087)

ORDINANCE NO. 2009-08-090

AN ORDINANCE AMENDING THE CITY OF URBANA COMPREHENSIVE PLAN 2005

(Adopting the Champaign County Multi-Jurisdictional
Natural Hazard Mitigation Plan)

WHEREAS, the Urbana City Council on April 11, 2005 in Ordinance No. 2005-03-050 adopted the 2005 City of Urbana Comprehensive Plan; and

WHEREAS, the Urbana City Council on June 20, 2005 in Ordinance No. 2005-06-087 adopted the Hazard Mitigation Plan as an element of the 2005 City of Urbana Comprehensive Plan; and

WHEREAS, the Federal Emergency Management Agency (FMEA) subsequently approved Urbana's Hazard Mitigation Plan with a requirement that it be updated by 2010; and

WHEREAS, Champaign County, with the assistance from the Champaign County Regional Planning Commission, has gathered information and prepared the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan;

WHEREAS, the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, after due publication and proper legal notification of a public hearing on August 6, 2009, the Urbana Plan Commission voted 6 ayes and 0 nays to recommended that the Urbana City Council adopt the Champaign County Multi-

Jurisdictional Natural Hazard Mitigation Plan as an official amendment to 2005 Urbana Comprehensive Plan, and superseding the 2005 Urbana Hazard Mitigation Plan; and

NOW, THEREFORE, BE IT ORDAINED BY THE CORPORATE AUTHORITIES OF THE CITY OF URBANA, ILLINOIS, as follows:

Section 1. That the attached document entitled "Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan", dated August 1, 2009, and incorporated herein by reference, is hereby adopted, and resolves to execute the actions in the Plan.

Section 2. That the attached Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan supersede the City of Urbana's existing Hazard Mitigation Plan, adopted by Ordinance No. 2005-06-087 on June 20, 2005.

Section 3. That those portions of the attached Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan pertaining to the City of Urbana are hereby adopted as an amendment to the 2005 Comprehensive Plan of the City of Urbana, as amended.

Section 4. The City Clerk is directed to publish this Ordinance in pamphlet form by authority of the corporate

authorities and thereafter file a certified copy in the Champaign County Recorder's Office in conformance with Chapter 65, Section 11-12-7 of the Illinois Compiled Statutes (65 ILCS 5/11-12-7).

Section 5. This Ordinance shall be in full force and effect upon the expiration of 10 days after the date of filing notice of the adoption of the comprehensive plan amendment with the Champaign County Recorder, in conformance with Chapter 65, Section 11-12-7 of the Illinois Compiled Statutes (65 ILCS 5/11-12-7).

PASSED by the City Council this _____ day of _____, 2009.

AYES:

NAYS:

ABSTAINS:

_____
Phyllis D. Clark, City Clerk

APPROVED by the Mayor this _____ day of _____, 2009.

_____
Laurel Lunt Prussing, Mayor

CERTIFICATE OF PUBLICATION IN PAMPHLET FORM

I, Phyllis D. Clark, certify that I am the duly elected and acting Municipal Clerk of the City of Urbana, Champaign County, Illinois. I certify that on the _____ day of _____, 2009, the corporate authorities of the City of Urbana passed and approved Ordinance No. _____, entitled: "**AN ORDINANCE AMENDING THE CITY OF URBANA COMPREHENSIVE PLAN 2005** (Adopting the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan), which provided by its terms that it should be published in pamphlet form. The pamphlet form of Ordinance No. _____ was prepared, and a copy of such Ordinance was posted in the Urbana City Building commencing on the _____ day of _____, 2009, and continuing for at least ten (10) days thereafter. Copies of such Ordinance were also available for public inspection upon request at the Office of the City Clerk.

DATED at Urbana, Illinois, this _____ day of _____, 2009.

Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan

August 1, 2009

CHAMPAIGN COUNTY rpc REGIONAL PLANNING COMMISSION

Acknowledgements

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The preparation of the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan was funded through a Pre-Disaster Mitigation Grant Program Planning Grant from the Federal Emergency Management Agency and by Champaign County.

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Acronyms

ASCE	American Society of Civil Engineers
CDP	Census Designated Place
DMA 2000	Disaster Management Act of 2000
ECIEDD	East Central Illinois Economic Development District
EMA	Emergency Management Agency
EMTs	Emergency Medical Technicians
EMTPs	Emergency Medical Technicians Paramedics
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPD	Fire Protection District
FSRS	Fire Suppression Rating Schedule
HMGP	Hazard Mitigation Grant Program
HMP	Champaign County Multi-Jurisdictional Hazard Mitigation Plan
IEMA	Illinois Emergency Management Agency
INHMP	Illinois Natural Hazard Mitigation Plan
ICC	International Code Council
ISO	Insurance Services Office
LRMP	Champaign County Land Resource Management Plan
MSA	Metropolitan Statistical Area
NCDC	National Climatic Data Center
NMSZ	New Madrid Seismic Zone
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OMB	Office of Management and Budget
PDSI	Palmer Drought Severity Index
RPC	Champaign County Regional Planning Commission
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic and Environmental
UIUC	University of Illinois at Urbana-Champaign
USGS	United States Geological Survey
WVSZ	Wabash Valley Seismic Zone

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Executive Summary

Purpose

The Champaign County Hazard Mitigation Plan (HMP) is intended to meet the planning requirements established in Section 104 of the *Disaster Mitigation Act of 2000* (42 USC 5165) and 44 CFR Part 201. The *Disaster Mitigation Act of 2000* (DMA 2000) encourages planning for disasters before they occur. DMA 2000 is administered by the Federal Emergency Management Agency (FEMA). An approved local mitigation plan that addresses the specific natural hazard threats to local jurisdictions makes jurisdictions eligible to apply for mitigation funding through these FEMA programs:

- Pre-Disaster Mitigation Program
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance

Scope

The Champaign County Natural Hazard Mitigation Plan identifies local hazard mitigation goals and objectives, and specific hazard mitigation actions to implement over the long term that will result in reduction in risk and potential for future losses associated with the occurrence of natural hazards.

The plan was developed to be useful to each participating jurisdiction. The Plan can be used to facilitate an increased awareness of potential natural hazards and a better understanding of potential losses from natural hazard events.

The development and ultimate adoption of the Plan by each jurisdiction identifies and prioritizes mitigation actions that can occur in each jurisdiction, in advance, to reduce or eliminate long-term risk to life and property from potential natural hazard events.

Planning Process

The HMP development process included four major stages, with opportunities for public participation throughout: 1) organizing resources; 2) assessing risks; 3) developing the mitigation plan; and 4) implementing the plan and monitoring progress.

Each of the 24 municipal jurisdictions located wholly or partially within the County agreed to participate in development of a multi-jurisdictional HMP. The major higher education institutions in the County (University of Illinois at Urbana-Champaign and Parkland College) also agreed to participate in developing the HMP. In total 27 jurisdictions, including the County, participated in developing the HMP.

A 'combination' approach was used to represent all participating jurisdictions on the HMP Planning Team. This approach allowed for the direct representation of the seven largest populated jurisdictions and two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team. The combination approach allowed for the direct representation on the Planning Team of approximately 90 percent of the population of all participating jurisdictions.

A broad-based HMP Advisory Group was recruited to support the Planning Team in their review of the draft HMP document and to provide their additional input at key stages during the project. Advisory Group members recruited during the Organization Stage included representatives of

each school district in Champaign County, key area-wide public and private service providers, and selected government agency representatives.

Public Participation

Ongoing opportunities for public input were an essential component of the HMP development process. Efforts to inform the public and to allow for their effective participation in HMP decision-making included: initial publicizing of the HMP to representatives of all municipalities in the County; establishment of an interactive HMP website; public notice of Planning Team meetings; information displays and press releases about HMP development; conducting a public preference survey; and holding a public meeting.

Hazards Profiles

Based on the *Illinois Natural Hazards Mitigation Plan* natural hazard ratings for Champaign County, the Planning Team selected the following natural hazards to profile for the HMP planning area:

- Severe Storms (including: tornados, damaging lightening, and hail)
- Severe Winter Storms
- Floods
- Extreme Heat
- Drought
- Earthquakes

All jurisdictions in the HMP planning area are at risk for all of the natural hazards profiled in the HMP, except for one type of flooding, commonly referred to as 'riverine flooding' or 'overbank flooding', which is flooding that occurs when the waters rise above the normal water line and overflow the banks of a river, stream, or channel. The jurisdictions of Allerton, Broadlands, Gifford, Homer, Longview, Ludlow, Ogden, Pesotum, Philo, Savoy, Thomasboro and Tolono do not contain land that is within the 100-year flood plain. There is very little chance that normally dry areas within those jurisdictions will become inundated with water from riverine flooding that results in significant damage. However, these jurisdictions may experience less damaging flooding phenomena such as ponding or flash floods.

Assessing Vulnerability to Natural Hazards

The data collection and analysis methods used to assess the vulnerability of HMP planning area jurisdictions to the profiled natural hazards included:

- Inventorying categories of property that could potentially be damaged;
- Determining average cost per square foot and the replacement cost for potentially damaged structures;
- Considering potential damage caused by each type of hazard including a general description of the economic impacts; and
- Ranking the vulnerability to each threat by jurisdiction.

HAZUS software was used to assess HMP planning area vulnerability to earthquake and flood hazards (specifically, riverine flood hazard). Specific hazard event scenarios were analyzed with HAZUS to provide a more detailed vulnerability assessment. Additional information regarding the procedures followed in assessing vulnerability with HAZUS software for the riverine flood and earthquake hazards are available in Appendix 3.

The ranking of six natural hazards based on the vulnerability assessments for each hazard is indicated in the following table:

Ranking of Hazards Based on Vulnerability Assessment

Natural Hazard	Hazard Rank	Annual Probability	Property & Crop Damage	Safety Hazard	Critical Facility Vulnerability	Potential Economic Disruption	Jurisdictions Affected
Severe Storm	**1**	81% *47% Tornado* *62% Hail* *7% Damaging Lightning*	Moderate	High	High	Medium	All
Flood	**2**	67%	Major	Medium	Medium	Medium	***By Riverine Floods:*** ▪ Unincorporated Champaign County ▪ Bondville ▪ Champaign ▪ Fisher ▪ Ivesdale ▪ Mahomet ▪ Rantoul ▪ Royal, ▪ Sadorus ▪ Sidney ▪ St. Joseph ▪ Urbana ▪ Parkland College ▪ UIUC ***By Ponding and Flash Floods:*** All
Severe Winter Storm	**3**	87%	Minor	High	Medium	Medium	All
Extreme Heat	**4**	-	Minor	High	Low	Low	All
Drought	**5**	-	Moderate	Low	Low	Medium	All
Earthquake	**6**	-	Minor	Low	Low	Low	All

- **Severe storms**, which include tornados, hail, and lightning, are the highest ranking natural hazard threat of the HMP. The large probability of severe storms, along with the potential threat to not only property, but the health and safety of the jurisdictions' citizens, make severe storms dangerous. The damage that occurs in a large severe storm tends to be more localized than a large flooding event, though tornados can damage property and cause injury across a large area.

- **Flooding** is the second highest ranking threat of the HMP. Although not all jurisdictions are threatened by riverine flooding, the frequency, high potential damage to property, and wide damage area of a flooding event make it a hazard which is likely to cause widespread, significant damage.

- **Severe winter storms** are the third ranking threat of the HMP. Severe winter storms can pose safety risks, particular associated with vehicular travel, because of the reduced visibility, and the slippery road conditions that they cause. Severe winterstorms not only have the capability of making travel dangerous, but can disrupt transportation altogether if roads become impassable. Ice storms can cause property damage and interruption of power service.

- **Extreme heat** is the fourth ranking threat of the HMP. Extreme heat is not usually associated with property damage, but poses serious health risks, especially to vulnerable populations. An extreme heat event is likely to affect the whole County, putting many people at a health risk.

- **Drought** is the fifth ranked hazard of the HMP. Droughts do threaten crops in the county. However, drought is ranked on the lower end of the hazards because it does not pose a significant threat to structures or critical facilities, nor does it pose a health and safety hazard.

- **Earthquake** is ranked last in the HMP. The lack of historical damage caused by earthquakes in Champaign County, and the modest damage that is predicted by the HAZUS model suggest that earthquakes are the hazard that are least likely to impact the HMP planning area.

The following key contains a description of categories used to rate overall vulnerability to natural hazards for each jurisdiction:

Key	na	Not a hazard to the jurisdiction
	L	Low Risk - little damage potential (e.g., minor damage to less than 5% of the jurisdiction)
	M	Medium Risk - moderate damage potential (e.g., causing partial damage to 5-10% of the jurisdiction; infrequent occurrence.
	H	Significant Risk - major damage potential (e.g., destructive, damage to more than 10% of the jurisdiction; regular occurrence.)

Using the above Key, a summary of vulnerability to natural hazards by jurisdiction is provided in the table below:

Summary of Vulnerability to Natural Hazards by Jurisdiction

Profiled Natural Hazards: ► / Jurisdictions: ▼	Severe Storms includes Tornados, Hail, Damaging Lightning	Severe Winter Storms	Riverine Floods	Flash Floods or Ponding	Extreme Heat	Drought	Earthquake
Village of Allerton	H	H	na	L	M	L	L
Village of Bondville	H	H	M	L	M	L	L
Village of Broadlands	H	H	na	L	M	L	L
Unincorporated Champaign County	H	H	M	L	M	L	L
City of Champaign	H	H	M	L	M	L	L
Village of Fisher	H	H	M	L	M	L	L
Village of Foosland	H	H	na	L	M	L	L
Village of Gifford	H	H	na	L	M	L	L
Village of Homer	H	H	na	L	M	L	L
Village of Ivesdale	H	H	M	L	M	L	L
Village of Longview	H	H	na	L	M	L	L
Village of Ludlow	H	H	na	L	M	L	L
Village of Mahomet	H	H	M	L	M	L	L
Village of Ogden	H	H	na	L	M	L	L
Village of Pesotum	H	H	na	L	M	L	L
Village of Philo	H	H	na	L	M	L	L
Village of Rantoul	H	H	M	L	M	L	L
Village of Royal	H	H	M	L	M	L	L
Village of Sadorus	H	H	M	L	M	L	L
Village of Savoy	H	H	na	L	M	L	L
Village of Sidney	H	H	M	L	M	L	L
Village of St. Joseph	H	H	M	L	M	L	L
Village of Thomasboro	H	H	na	L	M	L	L
Village of Tolono	H	H	M	L	M	L	L
City of Urbana	H	H	M	L	M	L	L
University of Illinois at Urbana-Champaign	H	H	M	L	M	L	L
Parkland College	H	H	na	L	M	L	L

Developing Mitigation Strategy
Planning Team Members identified four goals that broadly describe the long-term ideals and intentions of the HMP and objectives for each goal, consistent with those of the current *State of Illinois Natural Hazard Mitigation Plan* and the adopted *City of Urbana Hazard Mitigation Plan.*

The HMP goals and accompanying objectives follow:

Goal 1. Minimize avoidable deaths and injuries due to natural hazards.
Objectives
1-a Educate population regarding methods of protecting self and property from natural hazard impacts
1-b Establish adequate warning systems.
1-c Protect critical facilities and services from impacts of natural hazards.
1-d Arrange for provision of storm shelters and cooling centers for population.

Goal 2. Protect existing and new infrastructure from impacts of natural hazards.
Objectives
2-a Monitor condition of infrastructure for needed maintenance.
2-b Ensure that water is available in the event of a drought.

Goal 3. Include natural hazard mitigation in local government plans and regulations.
Objectives
3-a Improve the information base regarding vulnerability to impacts of natural hazards.
3-b Review local programs and ordinances to determine how they can better address the impacts of natural hazards.

Goal 4. Coordinate natural hazard mitigation efforts of participating jurisdictions.
Objective
4-a Update the multi-jurisdictional HMP every five years.

Specific Mitigation Actions For Each Hazard Planning Team members and HMP project staff reviewed a comprehensive range of specific mitigation actions for each hazard for each jurisdiction by reviewing groups of mitigation actions as identified by FEMA:

- preventive
- property protection
- natural resource protection
- structural projects
- public education and awareness

Mitigation Action Preference Survey The *Champaign County HMP Mitigation Measures Survey* was designed to gather public input about potential hazard mitigation actions. The survey was placed online at the HMP website (www.ccrpc.org/HMP) and paper copies of the survey were provided to the primary contact of each participating jurisdiction. The Survey was available online over an eight-week period, November 24, 2008 through January 16, 2009.

The survey contained 40 questions. Participants were asked to indicate whether they "strongly agree," "agree," "disagree," or "strongly disagree" with a series of natural hazard mitigation actions. Fifty-seven responses to the survey were received. Respondents most preferred implementing public awareness and public education mitigation actions; actions to protect critical facilities; and adopting building codes to require safe rooms and other standards to strengthen structures to be wind resistant.

Mitigation Action Prioritization Method Planning Team members agreed to a prioritizing method that involved a 3-step analysis of each mitigation action. Each mitigation action was scored using the 3-step method, with each step yielding up to 14 points each. The maximum total score for any one mitigation action could be 42.

STEP 1. The first analysis is one that assesses an 'action scope' for the mitigation action. Up to 14 points were allocated based on which category fits the subject mitigation action. Members determined which level each mitigation action fit into to: Level 1, Level 2, or Level 3. Next, if the mitigation action was determined to be a Level 1 or a Level 2 action, points were assigned based on Planning Team members' expertise and judgment as to the effectiveness of the mitigation action. Because Level 3 actions permanently eliminate or reduce property damages, injuries, or deaths in a specific area, Level 3 actions were assigned the highest amount of 14 points automatically.

A description of the 'action scope' levels and the points to be assigned to each 'action scope' level follows:

Level 1 Actions *Potential Score: 1 to 14 points*

- Eliminate or reduce property damages, injuries and deaths from less significant natural hazards; or
- Educate the public on disaster preparedness and mitigation related to the less significant natural hazards (e.g., drought, or earthquake)

Level 2 Actions *Potential Score: 8 to 14 points*

- Reduce property damages in a specific area; or
- Have the potential to reduce property damages, injuries and deaths across a wide area; or
- Educate the public on disaster preparedness and mitigation

Level 3 Actions *Score: 14 points*

- Permanently eliminate property damages and/or eliminate or reduce injuries and deaths in a specific area; or
- Have a high probability to systematically reduce property damages, injuries and deaths across a wide area.

STEP 2 **Cost Effectiveness Rating** *Potential Score: 1 to 14 points*

Members ranked each mitigation action qualitatively and subjectively, based on perceived cost-effectiveness of the mitigation action. In rating 'cost-effectiveness', a score of 14 points was possible, with lower scores denoting less cost-effectiveness and higher scores denoting greater cost-effectiveness.

STEP 3 **Feasibility Rating**: *Potential Score: 1 to 14 points*

Each action was assessed along 14 dimensions using a portion of FEMA's STAPLEE framework. If the action was generally positive in a certain dimension, it was given a point. The total points available for feasibility range from 1 to 14.

Total Score A total score was assigned to each mitigation action based on the 3-step prioritization process described above.

Total Score: 0-27 = Priority 3
28-35 = Priority 2
36-42 = Priority 1

Mitigation actions receiving the highest scores were rated as a Priority 1; those receiving mid-range scores were rated as a Priority 2; and mitigation actions receiving the lowest range of scores were rated as Priority 3.

Hazard Mitigation Actions Prioritized by Jurisdiction Chapter 6 includes a table that lists hazard mitigation actions, as prioritized, for each participating jurisdiction. Included for each mitigation action is information about the party responsible for implementing the mitigation action, funding source, and a suggested timeframe for implementation.

Monitoring, Evaluating, and Updating the Plan

To remain eligible for mitigation project funding opportunities, a FEMA requirement is that the Champaign County HMP be reviewed and revised as necessary to reflect changes in development, progress in mitigation efforts, and changes in its priorities, and resubmitted for FEMA approval every five years.

Chapter 7 describes the HMP maintenance procedure. The Planning Team recommends that the HMP be reviewed on an annual basis beginning one year after FEMA acceptance. The annual review will facilitate a means of tracking and recording progress of participating jurisdictions toward implementation of mitigation efforts, and allow an opportunity for Planning Team members to evaluate opportunities to better coordinate mitigation actions across participating jurisdictions. The annual review schedule will enable an easier, more efficient five-year update.

Ongoing opportunities for public participation will remain an essential component of the HMP maintenance process. Efforts to inform the public and allow for public input as the HMP is reviewed and updated will include: continuation of the HMP website; public notice of future Planning Team meetings; release of public service announcements and press releases; and holding a public meeting prior to the end of the five-year HMP update cycle to review updated information, modifications, and proposed mitigation actions at that time.

Chapter 1 Introduction

mitigate: to cause to become less harsh or hostile, to make less severe or painful… *

hazard mitigation: any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards… **

What is Natural Hazard Mitigation Planning?
A definition of hazard mitigation offered by FEMA is "any sustained action to reduce or eliminate the long-term risk to human life and property from hazards." 'Natural' hazard mitigation planning focuses specifically on natural, non-manmade hazards.

FEMA suggests that there are six broad categories of mitigation measures often included in hazard mitigation plans. The six categories, with examples of types of associated mitigation measures, are:

- **Prevention**
  (e.g., planning and zoning, building codes, water management)
- **Property Protection**
  (e.g., acquisition, retrofitting, insurance programs, flood proofing)
- **Public Education and Awareness**
  (e.g., outreach projects, technical assistance, hazard information centers)
- **Natural Resource Protection**
  (e.g., vegetative management, erosion and sediment control, wetlands preservation)
- **Emergency Services**
  (e.g., hazard warning systems, emergency response, protection of critical facilities)
- **Structural Projects**
  (e.g., improvements to stormwater infrastructure, dams, levees, or buttresses)

Jurisdictions with up-to-date hazard mitigation plans often benefit in these ways:

- the planning process leads to partnerships which can allow a variety of stakeholders to pool their resources, skills, and expertise;
- the planning process includes a systematic assessment of hazards and the prioritization of actions based upon cost analyses;
- funding priorities are well thought out and established in advance, enabling communities to quickly relate their needs to state and federal government when funds become available; and
- by reducing human-caused risk and better protecting each community for future generations, the sustainability of each community is increased.

** Source: Retrieved August 19, 2008, from http://www.merriam-webster.com/dictionary/mitigate*
*** Source: FEMA's Getting Started: Building Support for Mitigation Planning*

Purpose

The Champaign County Natural Hazard Mitigation Plan identifies community policies, actions and tools to implement over the long term that will result in reduction in risk and potential for future losses community-wide associated with the occurrence of natural hazards. The plan was developed to be useful to each participating jurisdiction. The Plan can be used to facilitate:

- an increased awareness of potential natural hazards; and a
- better understanding of potential losses from natural hazard events.

The development and ultimate adoption of the Plan by each jurisdiction identifies and prioritizes mitigation actions that can occur in each jurisdiction, in advance, to reduce or eliminate long-term risk to life and property from potential natural hazard events.

Scope

The Plan was developed to meet planning criteria of the *Disaster Mitigation Act of 2000*, and to achieve specific planning objectives established by the Federal Emergency Management Agency (FEMA), including:

- coordination among agencies;
- integration with other planning efforts & existing programs;
- state coordination of local mitigation planning;
- identify and profile all natural hazards;
- assess vulnerability & estimate potential losses;
- document planning process;
- assess capabilities of participating jurisdictions;
- develop hazard mitigation goals;
- identify and analyze mitigation measures;
- identify funding sources;
- adopt plan & implement mitigation measures;
- monitor, evaluate & update the Plan; and
- provide opportunities for continued public involvement.

Authority

The *Disaster Mitigation Act of 2000* (DMA 2000) is federal legislation that was signed into law on October 10, 2000. The aim of DMA 2000 is to encourage planning for disasters before they occur at both the state and local levels. FEMA administers DMA 2000.

In addition to introducing a new Pre-Disaster Mitigation Program (PDM), the Act created new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). After a disaster occurs, along with the money provided for recovery by FEMA, the HMGP provides funding for activities which will mitigate the impacts of future disasters. The PDM Program and Flood Mitigation Assistance (FMA) Program also fund mitigation activities.

Under Section 104 of DMA 2000 (42 USC 5165) a FEMA-approved mitigation plan is required in order for a jurisdiction to qualify for PDM, HMGP, and FMA funds. The FEMA requirements, introduced as the Interim Final Rule, were published in the Federal Register on February 26, 2002, at 44 CFR Parts 201 and 206. An approved mitigation plan must address the specific natural hazard threats to the participating jurisdictions to ensure the proper use of mitigation funding.

Local and State Hazard Mitigation Planning

1997 Champaign County Hazard Mitigation Plan The Champaign County Department of Planning & Zoning, in collaboration with the Champaign County Emergency Services & Disaster Agency, created the *Champaign County Hazard Mitigation Plan* in 1997. The plan focus was the unincorporated areas of Champaign County under the direct jurisdiction of the County Board. The plan included a description of the environment and natural resources of Champaign County, assessed the predominant natural hazards which threaten the County, and formulated mitigation goals. The plan did not include implementation measures or any level of public input. While the plan met FEMA guidelines at the time, it does not meet the current requirements introduced by DMA 2000.

2005 City of Urbana Hazard Mitigation Plan In 1998, *the* City of Urbana was invited by FEMA to participate in a program known as "Project Impact", a national initiative encouraging communities to come together to assess their vulnerabilities to natural hazards and to implement mitigation strategies in advance. As a part of the City's commitment to this initiative, the City developed and ultimately adopted a Hazard Mitigation Plan meeting FEMA requirements in 2005. The City of Urbana is the first jurisdiction within the County to adopt a FEMA-approved Hazard Mitigation Plan. The City of Urbana was eligible to participate in development of the multi-jurisdictional Champaign County HMP as a means to effectively update its existing Hazard Mitigation Plan.

2007 State of Illinois Hazard Mitigation Plan In 2004, the State of Illinois published the 2004 Illinois Natural Hazard Mitigation Plan (INHMP) in order to comply with requirements of DMA 2000. The plan was updated in 2007. The purpose of the INHMP is to provide a framework for mitigation efforts statewide. The plan aims to reduce future losses and costs to taxpayers by promoting and initiating long-term, interagency mitigation activities.

The plan includes generalized risk assessments for several types of natural hazards for each of the 102 counties in the State. Project staff utilized INHMP information in developing the natural hazards profiles contained in the Champaign County HMP.

Reference

Getting Started: Building Support for Mitigation Planning, Federal Emergency Management Agency, FEMA-386-1, 2002, pp. 1-8.

Chapter 2 Planning Process

Planning Process

The HMP development process included four major stages, with opportunities for public participation throughout, consistent with FEMA guidelines. The four stages of HMP development largely occurred in a sequential timeframe, with overlap to improve upon previous output as necessary. The main stages of HMP development are outlined in Table 2-1.

Table 2-1: Main Stages of HMP Development

Stages	Description
Organize Resources ▪ establish website ▪ publicize project ▪ recruit planning team ▪ identify advisory group ▪ invite jurisdictions to participate ▪ allow for public participation throughout HMP development	The project staff, consisting of the HMP Project Manager, a planning intern, and administrative support staff, publicized the HMP development to all municipal jurisdictions in the County, the University of Illinois at Urbana-Champaign, and Parkland College. The project staff solicited and obtained the agreement of 27 jurisdictions to participate in HMP development. The project staff recruited Planning Team Chair, Planning Team members, Advisory Group members, and oversaw establishment of the HMP website.
Assess Risks ▪ identify hazards ▪ profile hazard events ▪ inventory assets ▪ estimate potential losses ▪ review findings ▪ develop press releases	The project staff identified the natural hazards to profile, and consulted with GIS Consortium staff members regarding their use of HAZUS-MH software throughout the Risk Assessment stage of HMP development. Project staff distributed a poster to display information about the HMP development in local libraries throughout the HMP planning area, distributed a press release, and drafted a Risk Assessment report. The Planning Team and Advisory Group reviewed the findings of the Risk Assessment Stage.
Develop Mitigation Plan ▪ conduct public survey ▪ review capabilities of each jurisdiction ▪ formulate goal & determine objectives ▪ identify & prioritize mitigation action(s) ▪ draft implementation strategy	The project staff developed and publicized the public preference survey. Project staff and Planning Team members researched existing programs, plans, ordinances and documents for each participating jurisdiction that were relevant to HMP development. The project staff provided the Planning Team a review of survey results, background information regarding identification of goals and objectives, types of mitigation actions, and a proposal for prioritizing mitigation actions. Planning Team members discussed mitigation options and provided review comments to project staff. Project staff drafted the HMP document.
Implement Plan & Monitor Progress ▪ finalize implementation strategy ▪ establish monitoring program with ongoing opportunities for public input ▪ conduct public meeting ▪ finalize revisions to HMP ▪ participating jurisdictions adopt HMP plan	The project staff reviewed options for HMP maintenance with Planning Team members. Planning Team members reached consensus regarding a preferred HMP maintenance schedule. Project staff completed the draft HMP document and arranged a public meeting to receive public comment. Upon receiving HMP approval from FEMA, Planning Team members proceeded to seek adoption of the HMP from the jurisdictions directly represented on the Planning Team, and the Project Manager proceeded to seek adoption of the HMP from jurisdictions represented by the Champaign County Regional Planning Commission.

Multi-Jurisdictional Planning Participation

Early in the Organization Stage, HMP project staff contacted representatives of the 24 municipal jurisdictions located wholly or partially within the County to inform each of the opportunity to participate in development of a multi-jurisdictional HMP and to invite their participation. The major higher education institutions in the County (University of Illinois at Urbana-Champaign and Parkland College) were invited to participate in developing the HMP.

All invited jurisdictions agreed to participate in HMP plan development. Table 2-2 lists the jurisdictions and their estimated populations. Nineteen participating jurisdictions not directly represented on the HMP Planning Team provided resolutions authorizing the HMP project staff to represent them and to prepare the plan on their behalf. (Copies of the authorizing resolutions are provided in Appendix 2). Figure 2-1 is a map of all participating jurisdictions.

Table 2-2: Participating Jurisdictions

Key

Jurisdiction that is directly represented on Planning Team.

Jurisdiction that submitted a resolution authorizing the Champaign County Regional Planning Commission to represent their jurisdiction during HMP development.

	Participating Jurisdiction	2007 Population *
1	University of Illinois at Urbana-Champaign (UIUC)	39,266 students [1]
2	Parkland College	11,000 students [1]
3	Unincorporated area of Champaign County	18,275
4	City of Champaign	75,254 [2]
5	City of Urbana	40,550 [2]
6	Village of Rantoul	12,402
7	Village of Savoy	6,981 [2]
8	Village of Mahomet	6,264
9	Village of St. Joseph	3,982
10	Village of Tolono	2,850
11	Village of Fisher	1,753
12	Village of Philo	1,609
13	Village of Thomasboro	1,222
14	Village of Homer	1,143
15	Village of Sidney	1,129
16	Village of Gifford	1,000
17	Village of Ogden	732
18	Village of Pesotum	508
19	Village of Bondville	446
20	Village of Sadorus	402
21	Village of Ludlow	368
22	Village of Broadlands	311
23	Village of Ivesdale [3]	288
24	Village of Allerton [3]	277
25	Village of Royal	274
26	Village of Longview	147
27	Village of Foosland	87

** Source: U.S. Bureau of the Census 2007 Population Estimates*

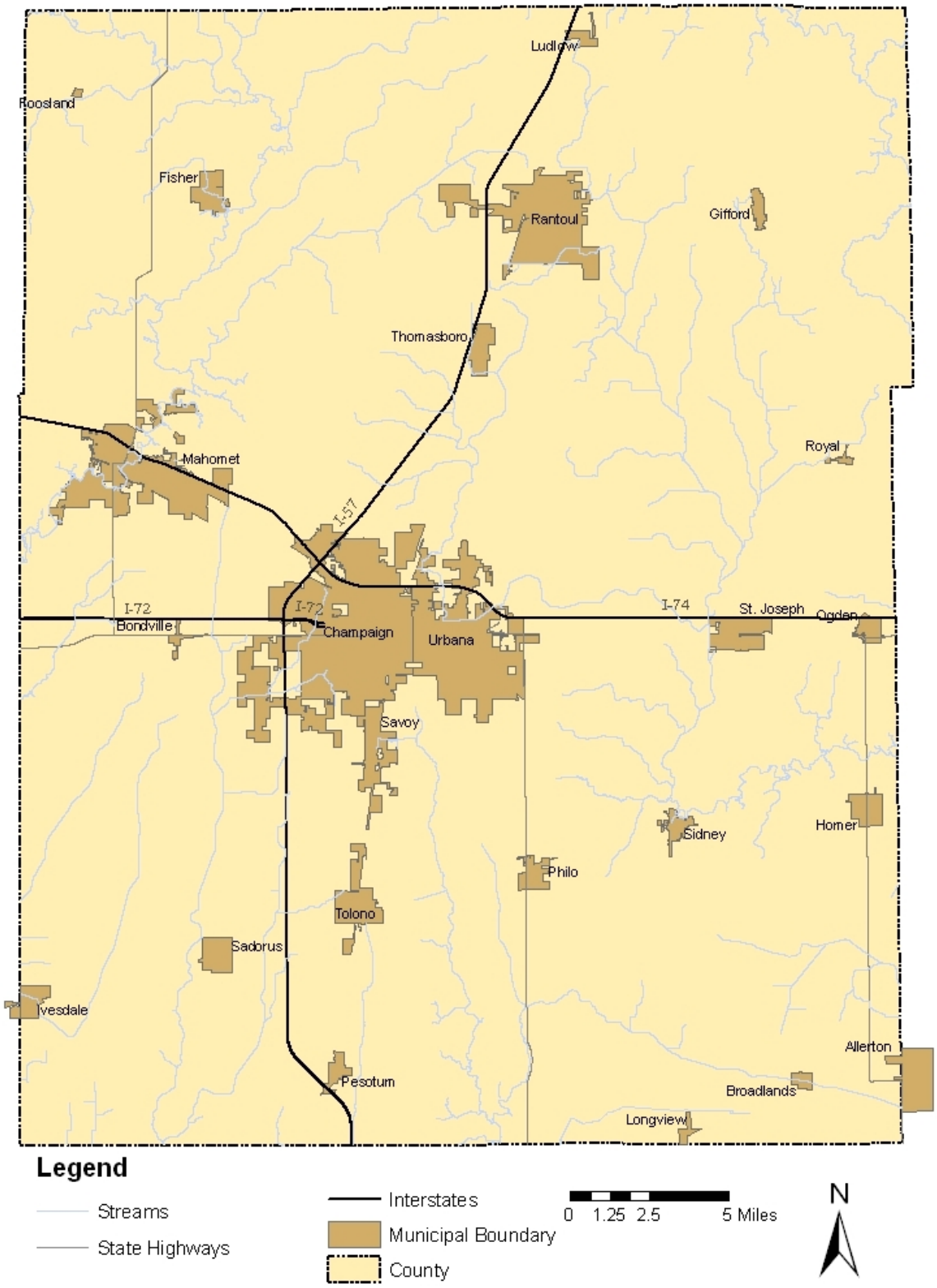
Table 2-1 Notes:

1. Estimates of student enrollment as of Spring, 2007 are provided. The UIUC estimate is from UIUC Management Information PN2006/066, dated February 1, 2007. The Parkland College estimate was provided by the Parkland College Office of Admissions and Enrollment Management. The actual student population is counted as part of the 2007 population estimates indicated for the underlying participating jurisdictions.

2. The 2007 Special Census population final figure is shown for the City of Champaign. The 2008 Special Census final figure is shown for the City of Urbana and the Village of Savoy.

3. Although the Villages of Ivesdale and Allerton are located partially within Champaign County, the entire geographic area of each Village is included as a participating jurisdiction.

Figure 2-1: Map of Participating Jurisdictions



Planning Team

With a total of 27 jurisdictions committed to participating in HMP development, HMP project staff selected a 'combination' approach to represent participating jurisdictions on the HMP Planning Team. This approach allowed for the direct representation of the seven largest populated jurisdictions and two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team. The combination approach allowed for the direct representation on the Planning Team of approximately 90 percent of the population of all participating jurisdictions.

Early in the Organization Stage, HMP project staff recruited Champaign County EMA Director Bill Keller to serve as Planning Team Chairperson.

Table 2-3: Combination Approach Used to Represent All Participating Jurisdictions

Jurisdictions with Direct Representatives on Planning Team

Participating Jurisdiction	Direct Representative
University of Illinois at Urbana-Champaign	**Todd Short**, Director, Office of Campus Emergency Planning
Parkland College	**Bonita Burgess**, Public Safety Lieutenant; **Von Young**, Public Safety Director
Champaign County	**Bill Keller** (Chair of Planning Team), Director; Champaign County Emergency Management Agency **John Dwyer**, Emergency Response Planner, Champaign Public Health District
City of Champaign	**Steve Clarkson**, Emergency Management Coordinator, **John Barker**, Acting Deputy Chief, City of Champaign Fire Department **Rob Kowalski**, Assistant Planning Director, City of Champaign
City of Urbana	**Tony Foster**, Division Chief, Prevention and Education **Robert Myers**, Planning Manager
Village of Rantoul	**Dan Culkin**, Chief Inspector
Village of Mahomet	**Bob Mahrt**, Village Planner,
Village of Savoy	**Jeremy Leevey**, Public Education & Prevention Coordinator
Village of St. Joseph	**James Haake**, Village of St. Joseph Trustee; **Terry Hitt ,** Village of St. Joseph Trustee

Jurisdictions providing Authorization to be represented on Planning Team

Participating Jurisdiction	
Village of Tolono Village of Fisher Village of Philo Village of Thomasboro Village of Homer Village of Sidney Village of Gifford Village of Ogden Village of Pesotum Village of Bondville Village of Sadorus Village of Ludlow Village of Broadlands Village of Ivesdale Village of Allerton Village of Royal Village of Longview Village of Foosland	**Authorization Provided by Village Board of Trustees** to Champaign County Regional Planning Commission HMP Project Staff **to Represent Jurisdiction on Planning Team**

Planning Team Meetings The Planning Team met a total of seven times between April, 2008 and May, 2009 to guide and review each stage of HMP development.

Meeting One: The initial meeting of Planning Team members included an introduction to the HMP development process, and the setting of guidelines for participation as an HMP Planning Team member. Planning Team members agreed that jurisdiction representatives should strive to attend each Planning Team meeting, and if that was not possible, to send a substitute representative to each Planning Team meeting. An overview of required HMP elements was provided, including means of encouraging public participation throughout HMP development, within project budget. The idea to form an HMP Advisory Group received support of the Planning Team, and the HMP timeline was reviewed.

Meeting Two: Existing programs, plans, ordinances and documents of participating jurisdictions were reviewed as they related to HMP development. The use of HAZUS-MH software was described for the Risk Assessment stage. The methods used to identify buildings, infrastructure, and critical facilities were reviewed. Hazard identification and hazard profiling were reviewed.

Meeting Three: Review of Risk Assessment findings occurred. An overview of the Mitigation Plan Development Stage was provided. The Planning Team formulated HMP goal statements.

Meeting Four: Plans for a public preference survey regarding mitigation actions were discussed. Planning Team members began the process of identifying existing and proposed mitigation actions for their jurisdiction.

Meeting Five: Planning Team members continued review of existing and proposed mitigation actions. Results of the HMP public preference survey were reviewed. Planning Team members decided on a method for prioritizing mitigation actions.

Meeting Six: Planning Team members prioritized the ongoing and proposed mitigation actions selected for each of their jurisdictions. Members discussed the HMP maintenance process and reached consensus regarding a method to monitor, evaluate, and update the HMP.

Meeting Seven: Planning Team members offered review comments of the HMP Review Draft and planned the public HMP review meeting.

Authorized Representation of Smaller Jurisdictions on Planning Team

Nineteen of the participating jurisdictions authorized project staff to represent their interests on the Planning Team during HMP development. Project staff achieved this as follows:

February-April, 2008

Project staff followed up via phone or email with the Village President of each of the smaller municipal jurisdictions, to answer questions or provide additional information about the proposed HMP development as described in an initial letter from the County Board Chair sent in January, 2008, and encouraged the Village's participation in the development of the HMP.

Upon request, project staff made presentations to the Village Board of Trustees about the proposed HMP project.

May, 2008

Project staff contacted representatives of each of the smaller municipal jurisdictions in order to collect data and ask questions about the enforced building codes, regulations, ordinances, and adopted plans of each Village.

October, 2008

Project staff contacted the Village President to review the types of ongoing mitigation actions of the Village, and to obtain feedback regarding what types of mitigation actions would make the most sense and would be most feasible for the Village to consider.

November, 2008

Project staff contacted the Village President to request assistance in collecting information about preferred mitigation actions for the Village. The Village President was asked to:

- inform Village Trustees and Village residents about the HMP Mitigation Action Preference Survey available for the public to take online. Paper copies of the Mitigation Action Preference Survey were provided to each participating jurisdiction; and
- arrange for the Village to post a link to the HMP Mitigation Action Preference Survey on the Village website, if the Village had a Village website. Project staff provided an instruction sheet for posting a link to the HMP Mitigation Action Preference Survey on the Village's website.

Project staff provided information posters to display at libraries throughout the HMP planning area. Posters included information about: types of natural hazards reviewed; types of risks assessed; ongoing mitigation planning efforts; information about an opportunity to provide feedback in a preference survey about hazard mitigation measures; who to contact for additional information; and the date, time and location of the public meeting scheduled to occur toward the end of the HMP development process.

December, 2008

Project staff followed up via email or phone with the Village Presidents regarding the letter sent in November, 2008, and provided additional information or copies of the Survey, upon request.

June, 2008

Project staff emailed the Village Presidents to provide a reminder regarding the upcoming public meeting to receive public comment on the HMP.

Project staff sent a letter to Village Presidents to share with the Village Board of Trustees. The letter contained a project update, and invited feedback regarding the Final Draft of the HMP, and requested that the Board of Trustees begin the process of review of the Final Draft of the HMP for adoption by the Village.

July-August, 2008

Project staff plans to be available to make presentations to Village Board of Trustees as they review the HMP for adoption.

Advisory Group

A broad-based HMP Advisory Group was recruited in early 2008 during the Organization Stage to support the Planning Team in their review of the draft HMP document and to provide their additional input at key stages during the project. Advisory Group members included representatives of each school district in Champaign County, key area-wide public and private service providers, and selected government agency representatives. The HMP Advisory Group members and their affiliation are listed below:

Advisory Group Members

- **Edward Bland**, Executive Director, Housing Authority of Champaign County
- **Jeff Blue**, County Engineer, Champaign County Highway Department
- **Jamie Davis**, Emergency Services Coordinator, Central Illinois Chapter, American Red Cross
- **Sandra Duckworth**, Director of Information Technology, Champaign School District
- **Kimberly Garrison-Clanton**, Manager of Marketing and Public Relations, Provena Medical
- **Anita Guffey**, Director of Emergency Preparedness, Carle Foundation Hospital
- **Andy Larson**, Superintendent, Heritage Community Unit School District
- **Beverly Herzog**, Senior Hydro geologist and Assistant to the Director for Environmental Initiatives, Illinois State Geological Survey, University of Illinois
- **Michael Little**, Executive Director, Urbana-Champaign Sanitary District
- **Drusilla Lobmaster**, Superintendent, Ludlow Community Consolidated School District
- **Alicia Maxey**, School Resource Officer, St. Joseph-Ogden Community High School District
- **Keith Oates**, Superintendent, Mahomet-Seymour Community Unit School District
- **Don Owen**, Assistant Superintendent, Urbana School District
- **Todd Pence**, Superintendent, St. Joseph Community Consolidated School District
- **Sally Prunty**, Planning Director, Champaign County Forest Preserve District
- **Michelle Ramage**, Superintendent, Thomasboro Community Consolidated School District
- **David Requa**, Superintendent, Rantoul Township High School District
- **Art Shaw**, Superintendent, Gifford Community Consolidated School District
- **Michael Shonk**, Superintendent, Tolono Community Unit School District
- **Dan Smith**, Illinois Emergency Management Agency
- **Stuart Smith**, Parts Administrator, Champaign-Urbana Mass Transit District
- **Bruce Stikkers**, Resource Conservationist, Champaign County Soil and Water Conservation District
- **Barbara Thompson**, Superintendent, Fisher Community Unit School District
- **Victor White**, Superintendent, Prairieview Community Consolidated School District

During the Spring of 2009, project staff contacted selected County administrators and planners of each County adjacent to Champaign County to notify them regarding the development of the Champaign County HMP and to solicit their input regarding any aspect of the Champaign County multijurisdictional HMP project. These contacts were made to representatives of Ford, McLean, Piatt, Douglas, and Vermilion Counties.

Public Participation

Ongoing opportunities for citizen input were an essential component of the HMP development process. Efforts to inform the public and to allow for their effective participation in HMP decision-making are described below.

- **Initial Outreach**. During the Organization Stage, key representatives of all municipalities in or partially in the County were invited to participate in developing a multi-jurisdictional HMP.

Each municipal jurisdiction placed the request to participate in developing an HMP on its Council or Trustee public meeting agenda. By request, HMP project staff reviewed benefits of mitigation planning with Village Trustees at public meetings in the Villages of Tolono, Pesotum, and Sadorus.

- **Interactive HMP Website**. During the Organization Stage, the HMP website (http://www.ccrpc.org/HMP) was created as a means to both share information with the public about development of the Champaign County HMP and to provide an interactive means to allow public feedback regarding the HMP during its development. The website included agendas and minutes of each HMP Planning Team meeting, plus related documents and links. Participating jurisdictions were encouraged to include a link to the HMP website from their own websites.

- **Public Notice of Planning Team Meetings**. A public notice of each HMP Planning Team Meeting was published beforehand in The News-Gazette, the newspaper in the County with the largest overall circulation.

- **Press Releases**. Press releases were issued during the risk assessment, mitigation planning, and implementation stages of HMP development. The press releases included information about opportunities for public participation in development of the HMP.

- **Information Displays**. Posters informing the public about ways to participate in HMP development were displayed at public libraries within the HMP area. Posters included information about: types of natural hazards reviewed; types of risks assessed; ongoing mitigation planning efforts; information about an opportunity to provide feedback in a preference survey about hazard mitigation measures; who to contact for additional information; and the date, time and location of the public hearing scheduled to occur toward the end of the HMP development process.

- **Public Preference Survey**. In December, 2008 and through mid-January, 2009, a preference survey regarding selected mitigation measures under consideration for each jurisdiction was made available to members of all participating jurisdictions online. Paper copies of the preference survey were provided to the primary contact for each participating jurisdiction and were made available upon request.

- **Public Hearing**. A public hearing was held before the Champaign County Environment and Land Use Committee on June 8, 2009. Comments and questions from the public were considered regarding aspects of the HMP draft itself, or regarding the process of HMP development.

References

Getting Started: Building Support for Mitigation Planning, Federal Emergency Management Agency, FEMA-386-1, 2002, p. xi.

Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning How-To Guide Number Eight, Federal Emergency Management Agency, FEMA-386-8, 2006, p. 12.

Chapter 3 Hazard Profiles

Identifying Natural Hazards

The State of Illinois prepared a statewide Natural Hazard Mitigation Plan (INHMP) in 2004, which was updated in 2007. The INHMP contains an analysis of the risk and impact of various natural hazards to each Illinois County, and provides hazard ratings across counties for each profiled natural hazard. The INHMP was based on data compiled between 1950 and 2002. Five rating levels were assigned, ranging from 'Low' to 'Severe'. The INHMP rating system is based on a combination of four factors: Historical/Probability, Vulnerability, Severity of Impact, and Population.

The INHMP indicates that Champaign County is at risk from these natural hazards: severe storms, tornados; severe winter storms; floods; extreme heat; drought, and earthquakes. Table 3-1 contains the INHMP ratings assigned to these natural hazards in Champaign County.

Table 3-1: INHMP Ratings Assigned to Natural Hazards in Champaign County

Natural Hazard	INHMP Rating for Natural Hazards Occurring in Champaign County	Description of INHMP Rating
Severe Winter Storms	Severe	Score range: 49-60 … Highest amount of points possible based on INHMP weighted rating system.
Severe Storms	Severe	Score range: 49-60 … Highest amount of points based on INHMP weighted rating system.
Tornados	High	Score range: 37–48 … Second highest amount of points possible based on INHMP weighted rating system.
Floods	High	Score range: 37–48 … Second highest amount of points possible based on INHMP weighted rating system.
Extreme Heat	Elevated	Score range: 25-36 … median amount of points possible based on INHMP weighted rating system.
Earthquakes	Elevated	Score range: 25-36 … median amount of points possible based on INHMP weighted rating system.
Drought	Guarded	Score range: 13-24 … Second lowest amount of points possible based on INHMP weighted rating system.

Source: Illinois Natural Hazard Mitigation Plan, October, 2004

Based on the above INHMP natural hazard ratings, the Planning Team agreed to profile the following natural hazards for the HMP planning area:

- Severe Storms (including: tornados, damaging lightening, and hail)
- Severe Winter Storms
- Floods
- Extreme Heat
- Drought
- Earthquakes

Federal Disaster Declarations in Champaign County

Champaign County has been included in four Federal Emergency Disaster Declarations since 1967, the first year that there was a federal disaster declaration in Illinois under the Office of Emergency Preparedness, a predecessor of FEMA. These Federal Disaster Declarations are described below and illustrate the significant damages that can occur in the HMP planning area as a result of natural hazards to be profiled in the Champaign County HMP.

1990 Ice Storm *(Declaration #: FEMA 860-DR)*

The first recorded Federal Disaster Declaration that included Champaign County occurred in 1990. On February 14th, Champaign County, along with nine other counties in Illinois, was hit by an ice storm. A total of 1.8 inches of rain fell over a 10- to 12-hour period, resulting in between 0.5 and 0.75 inches of ice accumulating on exposed surfaces. According to a report prepared by Richard J. Hauer, et al., more than 18,000 homes in Champaign-Urbana lost power, some for as long as eight days. Ice-laden tree branches that fell on power lines were the main causes of the power outages. The City of Urbana Hazard Mitigation Plan notes that over half of the trees in Champaign-Urbana were damaged in the storm. Falling tree branches were also responsible for causing damage to houses and automobiles. The City of Urbana incurred $768,000 in costs for emergency response and clean-up. The NOAA estimates that the storm caused in excess of $12 million in damages in Champaign County.

1994 Floods *(Declaration #: FEMA 1025-DR)*

In 1994, the large scale flooding that occurred in 16 Illinois counties, including Champaign County, led to the second recorded Federal Disaster Declaration for Champaign County. Heavy rains fell over a two-day period in April of that year and resulted in excess of $50 million in damages to homes, businesses, and property in the County.

1996 Tornados *(Declaration #: FEMA 1110-DR)*

In April of 1996, a series of tornados swept through Central Illinois, triggering a Federal Disaster Declaration that included Champaign County and four other counties. The tornados caused significant damage in the County, particularly in the Village of Savoy, City of Urbana and the Village of Ogden. The damage done in Savoy and Urbana was estimated at $9 million. The Village of Ogden sustained even heavier damage, with more than 200 homes receiving major damage, 80 homes completely destroyed and 13 people suffering minor injuries.*

* From the Village of Ogden website at http://ww2010.atmos.uiuc.edu/(Gh)/arch/cases/960419/dmg/home.rxml

1999 Winter Snow Storm *(Declaration #:FEMA 3134-EM)*

A Snow Emergency Declaration was issued on January 8, 1999 for 34 counties in Central and Northern Illinois, including Champaign County. A National Weather Service report described the storm as follows:

> "A major winter storm paralyzed much of the region, during the first few days of 1999. Snow began falling across portions of Central Illinois before noon on New Year's Day, and continued at moderate to heavy rates for most of the following 24 hour period. Areas from Charleston southward also saw the snow mixed with rain or freezing rain at times. Once the snow ended, high winds developed, causing severe blowing and drifting snow, and dangerous wind chills. The heaviest snow band

extended from near Quincy, to Virginia, then through the Peoria and Bloomington areas to Champaign, where 14 or more inches of snow were common. The weight of the heavy snow caused many roofs and porches to collapse, causing one death and one injury."

2002 Severe Storms, Tornados and Floods *(Declaration #: FEMA 1416-DR)*

The most recent Federal Disaster Declaration that included Champaign County resulted after a series of severe storms occurred between April 21-May 3, 2002, producing tornados and flooding that caused widespread damage to Champaign County and 67 other Central Illinois counties.

Hazard Profile: Severe Storms

In Illinois, severe storms occur as warm, moist air from the Gulf of Mexico comes in contact with cool air moving east from the Rockies.

The natural hazard category of 'Severe Storms' includes: thunderstorms, tornados, hail, and damaging lightning.

The *Climate Atlas of Illinois* defines a 'thunderstorm' as "a local storm produced by cumulonimbus clouds and always accompanied by lightning and thunder, and often by strong gusts, heavy rain, and hail." Thunderstorms can form as single cells, in clusters, or in lines and that the typical thunderstorm is 15 miles in diameter. Thunderstorms in Illinois are most likely to occur in the spring and summer months and usually in the late afternoon or evening. The National Weather Service (NWS) estimates that 10 percent of thunderstorms that occur are 'severe storms'. The NWS distinguishes a 'Severe Storm' from a regular thunderstorm if it produces hail at least 0.75 inches in diameter, or consecutive wind gusts 58 miles per hour or greater. Severe storms are hazardous because of the lightning, hail and tornados they are capable of producing. The INHMP ranks the risk of Severe Storms in Champaign County as "severe," which is the highest risk ranking.

Consequences of Severe Storms The different elements of severe storms each have the potential to do serious damage. The consequences and threats associated with rain include: flooding; reduced visibility; increased chance of automobile accidents; stormwater system backup; and crop damage. High winds and tornados can cause: building damage; downed power lines; auto accidents; tree damage; crop damage; injury; or death. Lightening can cause: fires; power outages; damage to electronics and appliances; injury; or death. Hail can cause building, vehicle and crop damage, and injury, in rare cases.

Locations Affected by Severe Storms The entire HMP planning area is at risk from severe storms, including lightning, tornados, and hail.

History and Extent of Previous Occurrences The National Climatic Data Center (NCDC) recorded 160 thunderstorm and high wind events in Champaign County between 1955, the earliest year for which there is data in the NCDC storm event database for this type of event, and 2007. Of the 160 storms, 16 caused an injury, a death, or property damage. Table 3-2 contains a summary description of these 16 storms.

Probability of Future Severe Storm Events Severe storms are very likely to occur over the entire HMP planning area. According to the NCDC, during the 53-year period between 1955 and 2007, a total of 160 thunderstorms with severe winds occurred in 43 different years. There is an 81% probability that a thunderstorm with severe winds will occur in the HMP planning area in any given year. In 33 years during the same time frame, more than one of these events occurred in the same year, indicating a 62% chance that more than one of these storms will occur in the HMP planning area in any year.

Table 3-2: Thunderstorm and High Wind Events Causing Damage 1955-2007

Location or County[1]	Date	Time	Recorded Windspeed [2]	Deaths	Injuries	Property Damage
CHAMPAIGN	06/29/1987	3:04 PM	N/A	0	5	0
CHAMPAIGN	03/25/1996	4:00 AM	N/A	1	0	0
Sadorus	08/23/1996	2:55 PM	N/A	0	0	5 K
CHAMPAIGN	04/30/1997	2:00 PM	61 kts.	0	1	38 K
Mahomet	08/24/1997	1:38 PM	N/A	0	0	700 K
Philo	03/28/1998	5:15 AM	N/A	0	0	90 K
Homer	06/12/1998	3:38 PM	N/A	0	1	0
Countywide	06/29/1998	4:42 PM	72 kts.	0	2	500K
Champaign	07/23/2001	1:38 PM	52 kts.	0	0	15 K
CHAMPAIGN	03/09/2002	2:00 AM	76 kts.	0	2	0
CHAMPAIGN	03/05/2004	7:05 AM	50 kts.	1	6	0
Ludlow	07/13/2004	2:07 PM	78 kts.	0	0	2.2 M
Urbana	07/18/2007	2:51 PM	N/A	0	0	2K
Champaign	10/18/2007	5:19 PM	N/A	0	0	2K
Ogden	10/18/2007	5:55 PM	N/A	0	0	31K

Source: National Climatic Data Center

Table 3-2 Notes

1. "CHAMPAIGN" in all capital letters refers to an unspecified location within Champaign County.
2. N/A means that recorded windspeed data is not available.

Lightning

All thunderstorms produce lightning strikes. Lightning, as described by FEMA, is caused when electrical energy builds up and is discharged between positively and negatively charged areas. Only 25 percent of lightning strikes are cloud-to-ground; however, lightning still poses a significant threat during severe storms. According to the NWS, lightning can strike up to ten miles away from where it is raining.

The INHMP states that lightning kills more people each year than tornados. Each year in the United States, approximately 1,000 people are injured and 80 are killed by lightning. Further, lightning fatalities generally occur at outdoor recreational events and near trees. The economic

impact of lightning in the United States is estimated at $5 billion every year. In Illinois, a total of 96 people have died as the result of lightning over the past 40 years, ranking Illinois high amongst the states for the number lightning fatalities.

History and Extent of Previous Occurrences of Damaging Lightning Since the beginning of 1993, the earliest year that the NCDC storm events database tracked damage caused by lightning, through the end of 2007, there was one reported occurrence of lightning causing damage in Champaign County. That incident was a lightning strike that caused an injury on July 14, 1997 in the Village of Mahomet. The NCDC storm event database states:

> "Lightning struck a television antenna on a home in Mahomet. It travelled through the roof and knocked a man out of his wheelchair. He only suffered minor injuries and was treated and released from a local hospital. The lightning strike caused approximately $3,500 in damage to the roof."

Probability of Future Lightning Strike Damage The one reported case of lightning damage reported since 1993 suggests that there is approximately a 7% chance that there will be a lightning strike which causes damage in any given year in the HMP planning area. Local reviewers of the HMP indicated that damaging lightning strikes often burn buildings or destroy electrical devices in buildings throughout the HMP planning area, and that damaging lightning is typically under-reported.

Hail

Severe storms are capable of producing hail. Hail, round balls of ice and snow, can potentially damage both crops and property. Additionally hail can cause icy surfaces that cause people to slip and fall, or vehicular accidents. Table 3-3 describes the different categories of hail based on size.

Table 3-3: Hail Size Classification

Size (Inches)	Description
1/2	Marble Size
3/4	Penny Size
7/8	Nickel Size
1	Quarter Size
1 1/4	Half Dollar Size
1 1/2	Ping Pong Ball Size
1 3/4	Golf Ball Size
2	Egg Size
2 1/2	Tennis Ball Size
2 3/4	Baseball Size
3	Teacup Size
4	Grapefruit Size
4 1/2	Softball Size

According to the INHMP, as of October 2004, hail storms had occurred 3,951 times in Illinois since 1950, or an average of 74 times every year. No one in Illinois has died as the result of hail since 1950; however, 23 people have been injured, as well as numerous domestic or farm

animals. It is estimated that between 1950 and 2003 hail caused $73 million dollars in property damage and $5 million in crop damage statewide.

History and Extent of Previous Hail Storms According to the NCDC, there were 71 different storms which produced hail in Champaign County between 1955, the first year that the NCDC storm event database tracks hail events, and 2007. The storm descriptions reveal that, generally, the larger the size of the hail, the more damage it causes. One of the most notable hail storms in Champaign and Vermilion counties occurred on May 18, 2000. The NCDC describes the storm:

> "A series of thunderstorms (six) formed and moved over a two county area over a 2-1/2 hour period. Over $4 million dollars worth of damage was reported. The most intense damage was reported in the Jamaica and Georgetown (Vermilion County) areas. Georgetown was hit twice within an hour's time by baseball sized hail. A greenhouse sustained major damage. Thousands of cars sustained major hail damage, including broken windshields. Also, hundreds of homes and businesses had windows broken out and siding damaged. In Jamaica, the high school sustained around $300,000 in damage to its facilities. In Pesotum (Champaign County), eleven Illinois State Patrol squad cars sustained minor to major hail damage. A couple of the cars had windshields broken, as well as the light bars on top. Damage to the squad cars was estimated around $24,000. No injuries were reported."

Table 3-4: Number of Hail Events by Jurisdiction 1955-2007

Jurisdiction	Number of Hail Events
Unspecified - Champaign County	36
Broadlands	1
Champaign	11
Rantoul	4
Mahomet	14
Ivesdale	7
Philo	3
Tolono	2
St. Joseph	2
Sadorus	1
Urbana	3
Sidney	1
Ogden	3
Pesotum	2
Fisher	2

Probability of Future Storms Which Produce Hail In the 53-year period between the beginning of 1955 and the end of 2007 in Champaign County, there were 71 different storms which produced hail occurring in 33 different years. This indicates a 62% probability that there will be a storm which produces hail in the HMP planning area in any given year. Over this same time period, there were 20 years in which more than one storm produced hail. This indicates a 38% chance that in any given year there will be more than one storm which produces hail in the HMP planning area.

Tornados

Severe storms not only have the potential to cause damage from lighting and hail, but they can produce tornados. Tornados are most common in the Midwest and southeastern parts of the country. Tornados most frequently occur between March and August, but can occur any time of the year. The American Society of Civil Engineers (ASCE) produces design wind speed standards for construction. The HMP planning area is in Zone IV, meaning that a community shelter must be built to withstand a 3 second 250 mph wind gust. The INHMP categorizes the risk of tornados to Champaign County as "High," which is the second highest ranking. Champaign County experienced 44 tornados between 1950, the earliest year that the NCDC storm event database collected tornado data, and 2002. According to the INHMP, this ranks Champaign County as the 14th highest county in Illinois for the number of tornados per square mile over this time period.

The intensity of tornados, including their wind speed and the type of damage they cause, are categorized by the Enhanced Fujita Scale, which was created and implemented by the NWS in February of 2007.

Table 3-5: Enhanced Fujita Scale

Category EF0	(65-85 mph)	Light damage. Peels surface of off some roofs; some damage to gutters or siding; branches broken off trees; shallow rooted trees pushed over.
Category EF1	(86-110 mph)	Moderate damage. Roofs severely stripped; Mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
Category EF2	(111-135 mph)	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
Category EF3	(136-165 mph)	Severe damage. Entire stories of well constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
Category EF4	(166-200 mph)	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
Category EF5	> 200 mph	Incredible damage. Strong frame houses leveled off foundations and swept away, automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Source: National Weather Service

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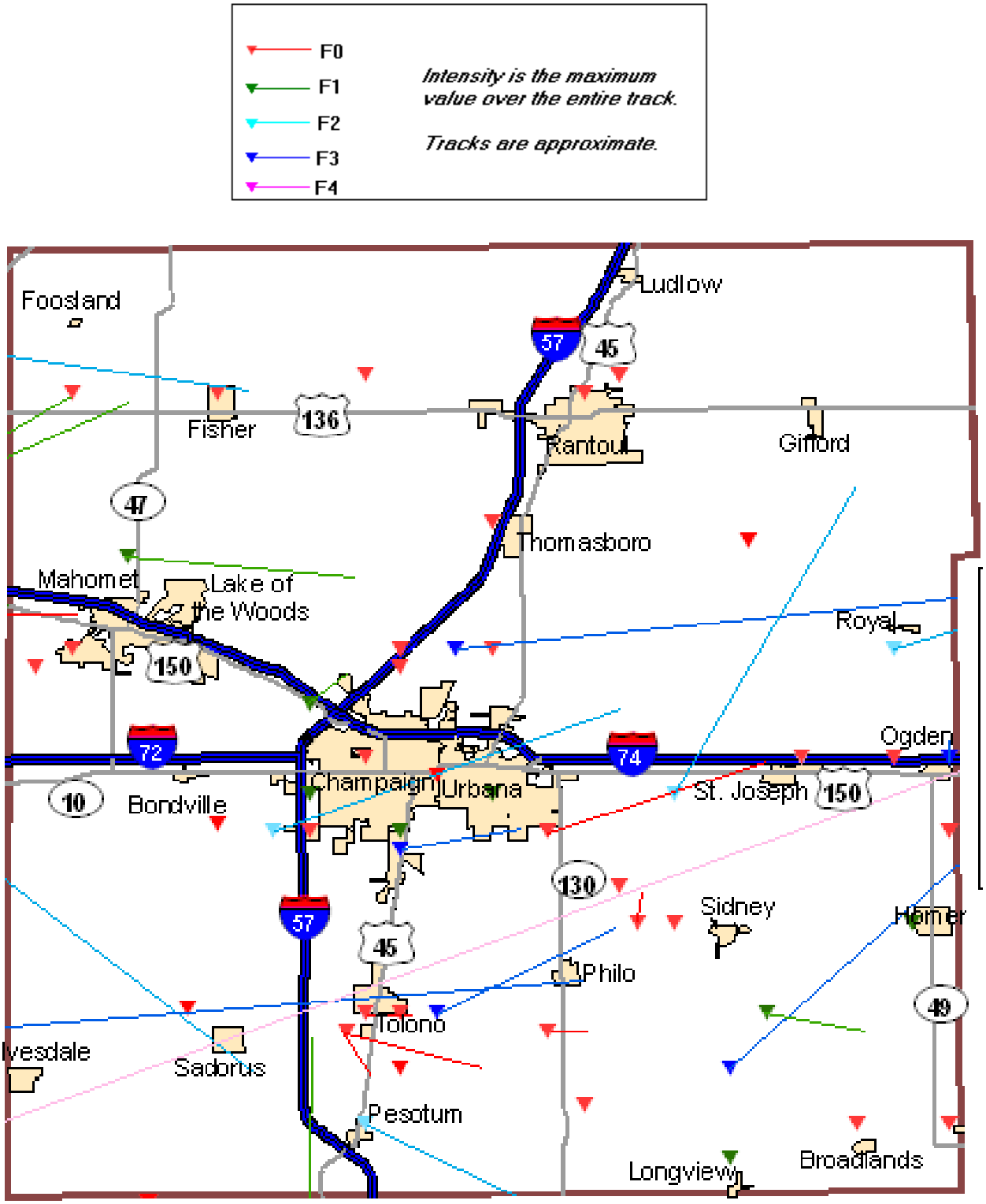
Figure 3-1: Champaign County Tornados 1950 to 2007



Source: National Weather Service, http://www.crh.noaa.gov/ilx/?n=champaign-tor

History and Extent of Previous Tornados

The most recent large tornado to hit Champaign County was on April 19, 1996. The tornado first touched down near Savoy, and then in Ogden. The NCDC describes the tornado in the following two accounts:

> "A tornado briefly touched down one mile north of Savoy (near Rt. 45 and Curtis Road) and destroyed three homes under construction. Then the tornado lifted, travelled to the northeast, and touched down again one mile south of Urbana. The tornado destroyed 30 homes, caused moderate damage to 29 homes and one business, and minor damage to 54 homes and four businesses. Twelve people were injured and damage was estimated between $7 and $11 million."

> "A tornado touched down half a mile to the southwest of Ogden and travelled to the northeast right through the middle of the town. The tornado destroyed 68 homes, 12 businesses, three churches, the library, and a grade school. Once east of town, the tornado crossed I-74, where it killed a woman who was riding in a semi with her husband. The semi and trailer were picked up and rolled into a field. The woman, who had been in the sleeper portion, was thrown about 30 yards from the truck. She was killed instantly. After rolling the semi, the tornado damaged two more homes before lifting and dissipating one mile north northeast of Ogden. Back in Ogden, the damage was variable. One house would have significant damage, when a nearby structure would only have minor damage. In addition to the destroyed homes and businesses, 128 homes and 8 businesses sustained major damage and 51 homes and 12 businesses had minor damage. With its larger width, it appears that this tornado had multiple circulations within the parent tornado. Overall, one woman was killed and 13 people were injured."

Table 3-6 lists information regarding all tornados causing either injuries or property damage in the HMP planning area between 1950 and 2007.

Probability of Future Storms Which Produce Tornados In the 58-year period from 1950, the first year that the NCDC Storm Events Database tracks tornados, through 2007 there were 45 different storms which produced tornados in Champaign County occurring in 27 different years. This indicates that there is a 47% probability that there will be a storm which produces a tornado in the HMP planning area in any given year. In this same time period, there were 16 different years in which there was more than one storm that produced a tornado in the County. This suggests that there is a 28% chance that there will be more than one storm that produces a tornado in the HMP planning area in any year.

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Table 3-6: Tornados Causing Injuries or Property Damage 1950 – 2007

Location*	Date	Time	Magnitude	Deaths	Injuries	Property Damage
Leverett	04/09/1953	5:15 PM	F3	0	5	25 M
Ivesdale	06/05/1960	12:49 AM	F2	0	1	250 K
Tolono	06/23/1960	4:03 AM	F2	0	0	25 K
Urbana	03/04/1961	6:15 PM	F0	0	0	25 K
Broadlands	03/06/1961	4:37 AM	F2	0	0	250 K
Royal	07/02/1962	3:30 PM	F2	0	0	25 K
Sadorus	04/22/1963	6:32 PM	F3	0	5	250 K
Champaign	01/24/1967	8:40 PM	F2	0	5	25 K
Champaign	04/21/1967	8:50 PM	F1	0	0	3 K
Urbana	12/10/1971	5:00 AM	F1	0	0	250 K
Tolono	04/03/1974	2:48 PM	F3	1		250 K
Homer	04/03/1974	2:55 PM	F3	0	0	250 K
St. Joseph	04/12/1974	8:05 PM	F2	0	0	250 K
CHAMPAIGN	03/20/1976	1:35 PM	F4	0	11	2.5 M
CHAMPAIGN	06/08/1981	8:37 PM	F1	0	0	25 K
Mahomet	06/08/1981	8:40 PM	F1	0	0	25 K
Homer	08/28/1984	6:09 PM	F1	0	0	250 K
Fisher	11/19/1985	4:04 PM	F1	0	0	250 K
St. Joseph	06/02/1987	1:12 PM	F2	0	0	25 K
Urbana	05/09/1990	7:40 PM	F1	0	0	25 K
Pesotum	06/20/1990	12:55 AM	F2	0	0	2.5 M
Savoy	04/19/1996	7:34 PM	F3	0	12	9 M
Ogden	04/19/1996	7:55 PM	F3	1	13	N/A
Mahomet	06/20/2000	8:14 PM	F0	0	0	20 K
Champaign	10/24/2001	12:55 PM	F1	0	2	500 K
Pesotum	04/20/200	1:06 PM	F0	0	0	15K
Sidney	06/10/2004	1:38 PM	F1	0	0	5K
Totals:				2	55	41.993 M

Source: National Climatic Data Center

Table 3-6 Note*: “CHAMPAIGN” in all capital letters refers to an unspecified location within Champaign County.

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Hazard Profile:
Severe Winter Storms

Severe winter storms fall into three categories: blizzards; heavy snow storms; and ice storms. These are defined in the INHMP, as follows:

> *Blizzard*
> A blizzard is the most dangerous of all winter storms. A blizzard combines low temperatures, heavy snowfall and winds of at least 35 miles per hour, reducing visibility to only a few yards.
>
> *Ice Storm*
> An ice storm occurs when moisture falls and freezes immediately upon impact.
>
> *Heavy Snow Storm*
> A snow storm is one that produces six inches or more of snow in 48 hours or less.

The National Weather Service (NWS) categorizes severe winter storms for the purposes of providing early warning, which is important for minimizing their potential impacts. The NWS issues these types of warnings regarding severe winter storms:

- A *Winter Weather Advisory* is issued when a significant winter storm or hazardous winter weather is occurring, imminent, and is an inconvenience.
- A *Winter Storm Warning* is issued when a significant winter storm or hazardous winter weather is occurring, imminent, or likely and is a threat to life and property.
- A *Heavy Snow Warning* is issued if significant snowfall is expected; criteria vary depending on location.
- A *Blizzard Warning* is issued when winds are 35 mph or greater, with blowing snow reducing visibility to a quarter-mile or less for at least three hours, and when dangerous wind chill temperatures are expected in the warning area.

Consequences of Severe Winter Storms
Deaths from dangerously low temperatures, power outages, and injuries and fatalities from hazardous driving conditions are the main threats posed by severe winter storms.

Locations Affected by Winter Storms
All of the jurisdictions and locales within the county are at risk from severe winter storms. These storms usually cover a geographic area that is much larger than a single county. Due to their vast open spaces, peripheral agricultural areas are at greater risk for the “white outs” and drifting associated with heavy snow and blizzards. Ice storms often do more damage to higher density areas because of the presence of large shade trees and overhead electrical lines.

History and Extent of Previous Severe Winter Storms
Severe winter storms can cause casualties, and have caused numerous traffic fatalities and injuries in Champaign County. According to the NCDC there have been seven deaths and 37 injuries in Champaign County and surrounding counties due to snow and ice storms since 1993. Winter storms are also capable of causing serious property damage, including costly damage to

electrical utilities. Destruction of electrical utility infrastructure not only affects the utility companies, but can cause loss of revenue for businesses if they experience power service interruption.

Probability of Future Severe Winter Storms
Severe winter storms are common in the HMP planning area. In the 15-year period between the beginning of 1993 and the end of 2007, there were 24 winter storm events in 13 different years. This indicates that there is an 87% chance that there will be a winter storm event in the HMP planning area in a given year. In eight of those years, there was more than one winter storm event. This suggests that there is a 53% chance that there will be more than one winter storm event in a year in the HMP planning area.

Hazard Profile: Floods

The INHMP states that flooding is the second most common hazard in the United States, following fire. A simple definition of flooding is "an overflow of water onto land that is normally dry." IEMA identifies the following types of floods among others: riverine floods, flash floods, overland floods, and coastal floods.

Riverine Floods Riverine floods occur when water from rainfall or snow melt flows at a quantity and speed that a river, stream, or creek cannot absorb. The result is that the areas immediately surrounding these bodies of water can become inundated with water. These types of floods usually develop slowly over the course of several days or weeks, as precipitation accumulates.

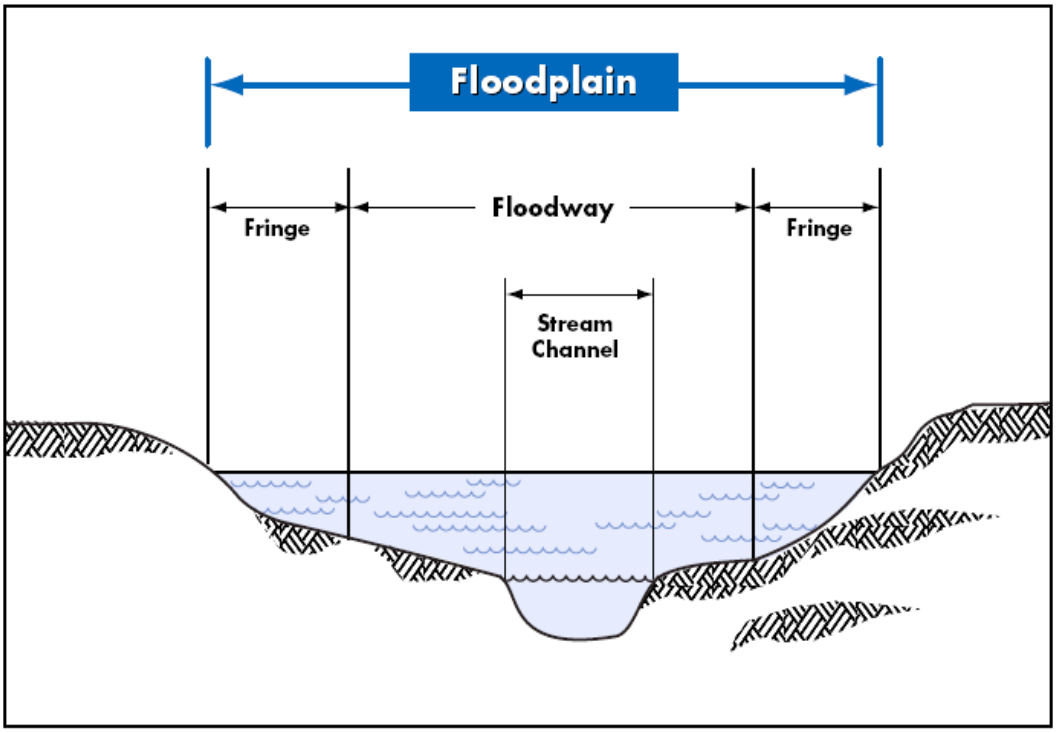
The estimated probability of a riverine flood event occurring in any given year is typically described using the terms: '10-year', '50-year', '100-year' or '500-year' flood. These terms are referenced in the process of determining flood insurance rates in flood-prone areas as follows:

- a 10-year flood event has a ten percent probability of occurring in any given year;
- a 50-year flood event has a two percent probability of occurring in any given year;
- a 100-year flood event has a one percent probability of occurring in any given year; and
- a 500-year flood event has a 0.2 percent probability of occurring in any given year.

Though unlikely, it is possible to have two 100-year flood events, or even two 500-year flood events occur within years, or even months, of each other.

The 100-year flood is the standard used by the NFIP in determining whether flood insurance is required. FEMA's Flood Insurance Rate Maps (FIRM) shows the 100-year floodplain based on existing conditions at the time of map preparation. The 100-year flood is also referred to as the "base flood." The 100-year floodplain is designated as 'Zone A' on the FIRMs for the HMP planning area jurisdictions that have 100-year floodplain areas. Figure 3-2 shows the relationship between a river and its floodplain, specifying a 100-year floodplain as 'Floodplain'.

Figure 3-2: 100-Year Floodplain



Source: Illinois Department of Natural Resources
http://dnr.state.il.us/owr/resman/Downloads/IL%20FPM%20Quick%20Guide.pdf

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Flash Floods Flash floods are quickly developing floods that occur as the result of the rapid accumulation of large quantities of precipitation, usually from intense thunderstorms. Flash floods are particularly dangerous because of their quick onset and possibility of occurring with little warning. While intense precipitation is the most common cause of flash flooding, dam failure can cause the most catastrophic flash floods. Flash flood waters move at extremely rapid speeds. They can damage crops, move boulders, uproot trees, and destroy bridges and infrastructure, and cause severe erosion. Figure 3-3 shows an extreme (non-local) example of the quick onset and rapid speed of flash flooding and how a road can be rendered impassable.

Figure 3-3: An Example of Flash Flooding

Source: NASA Water Management Project Office.
http://wmp.gsfc.nasa.gov/Wiring Diagrams/FlashFlood2.jpg

Overland Floods and Ponding Overland floods and ponding occur outside of rivers or streams as the result of water accumulating in poorly draining soils or in low lying areas. Overland flooding may be the result of heavy precipitation, snow melt, or broken water lines, amongst other causes. Overland flooding can lead to the accumulation and pooling of water, a phenomenon known as ponding. Ponding can disrupt transportation by making roads impassable, damage crops, and contribute to erosion. Figure 3-4 depicts an example (non-local) of ponding in a wooded area.

Figure 3-4: An Example of Ponding

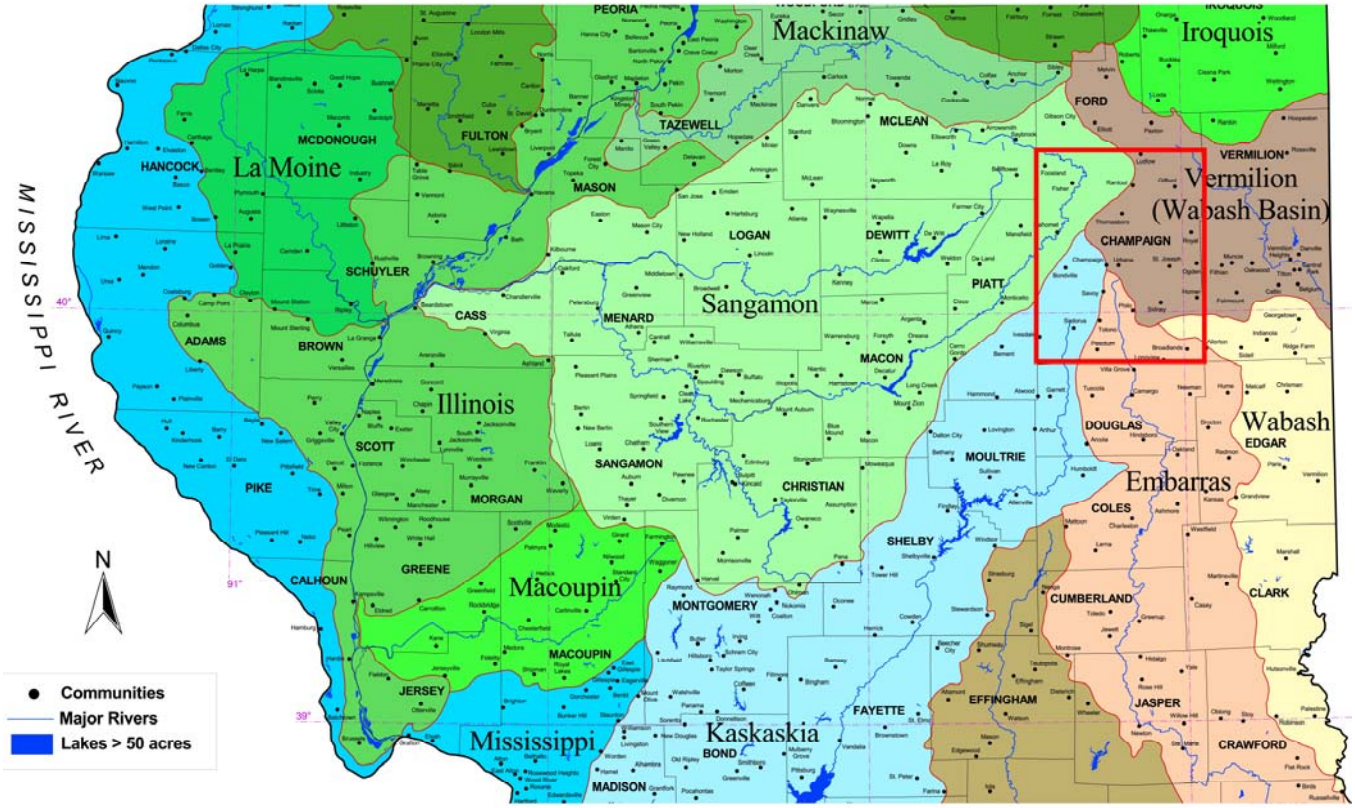
Source: Medina County Soil and Water Conservation District
http://medinaswcd.org/images/backyard%20ponding.jpg

One of the major factors which determines were flooding will occur is the location and capacity of watersheds. Champaign County is unique, as it is the only county in Illinois that contains five different watersheds:

- Kaskaskia River
- Vermillion River (Wabash Basin)
- Wabash River
- Embarras River
- Sangamon River

Figure 3-5 below shows the major watersheds in Central Illinois; Champaign County (depicting the HMP planning area) is highlighted.

Figure 3-5: Major Watersheds of Central Illinois



Source: Illinois State Water Survey
http://www.sws.uiuc.edu/iswsdocs/maps/ISWSMS2000-01.pdf

Consequences of Floods Flooding can disrupt transportation, cause property damage, crop damage, injuries and deaths.

Locations Affected by Floods Based on FEMA Flood Insurance Rate Maps (FIRM), each HMP participating jurisdiction listed below contains areas that are inside the 100-year flood plain. Therefore, these are the HMP participating jurisdictions that are at risk for 'riverine' or 'overbank' floods:

- Village of Bondville
- City of Champaign
- Village of Fisher
- Village of Mahomet
- Village of Rantoul
- Village of Royal
- Village of Sadorus
- Village of Sidney
- Village of St. Joseph
- City of Urbana
- Unincorporated Champaign County

Portions of all jurisdictions participating in the HMP are at some risk from some amount of flash flooding and overland flooding, depending on local ground elevations.

The low relief of Champaign County, its position at the intersection of drainage divides, and its glacially derived soils cause it to be poorly drained. Flood depths in the majority of areas in the County are less than five feet.

The Table 3-7 summarizes high water discharges and elevations for major streams at United States Geological Survey (USGS) stream gauges.

Table 3-7: 100-Year and Record Discharges on Gauged Streams in Champaign County

Stream & Gauge Location	100 Year Estimate			Record Flood			
	Discharge (Cubic Feet per Second)	**Flood Stage** (Feet)	**Flood Elevation**	**Year**	**Discharge** (Cubic Feet per Second)	**Flood Stage** (Feet)	**Flood Elevation**
Embarass River at Villa Grove	10,370		650.9	1950			648.2
Kaskaskia River Near Pesotum	4,540				3,310	15.92	
Salt Fork River at CR 1850 N	8,000	16.9	665.3				
Salt Fork River Near Ill. Rt. 49	10,900	14.0			10,100	15.69	
Sangamon River Near Fisher	10,619			1994	>15,000	21.59	
Sangamon River Near U.S. Rt. 150	16,400	20.0	685.8	1994	NA	22.3	

Source: Champaign County Hazard Mitigation Plan, 1997

History and Extent of Previous Occurrences

Champaign County has been a part of two federally declared flood disasters:

- In 1994, large scale flooding in 16 Illinois counties, including Champaign County, led to a federal emergency declaration. Heavy rains fell over a two-day period in April of that year and resulted in excess of $50 million in damages to homes, businesses, and property in the County. This is the most damaging flood in recent years affecting Champaign County and other Central Illinois areas.

- Most recently, occurring between April 21 and May 3, 2002, a series of severe storms produced tornados and flooding that caused widespread damage to 68 counties in Central and Southern Illinois, including Champaign County.

In total, between 1993 and 2007, there were 21 separate flood events in Champaign County. The following descriptions come from NCDC storm event database records:

- ***August 12, 1993 – Champaign, Urbana and Savoy – Flash Flood***
  According to the NCDC storm events database, a record 6.49 inches of rain fell in the Champaign-Urbana area, most of it falling in a 2.5 hour period. This large rainfall caused flash flooding. Highway 45 south of Savoy was closed due to flooding of the Phinney Branch. Many homes and roads were flooded.

- ***April 11, 1994 - Champaign, De Witt, Douglas, Macoupin, Montgomery, Piatt, Sangamon, Vermilion Counties - Flash Floods***
  NCDC records indicate that very heavy rain fell over most of central Illinois on April 11th and 12th. The rainfall amounts ranged from 1.40 inches to 5.28 inches in less than six hours at

April 11, 1994 - Champaign, De Witt, Douglas, Macoupin, Montgomery, Piatt, Sangamon, Vermilion Counties - Flash Floods continued
most locations. Numerous homes were damaged by flash flooding and many roads were closed due to flooding. While there were no reported injuries in Champaign County, two people died after trying to drive their cars across flooded roadways in other counties. One occurred near White Oak in Montgomery County sometime after 0530 CST on the 11th. A man was travelling north when his car went off the road into Horse Creek. The second fatality occurred west of Thayer in Sangamon County at 0430 CST. The car was crossing a bridge over a branch of Sugar Creek when it was swept 50 yards into the flooded stream. In total there was an estimated $50 million in property damage over the eight-county region.

- ***May 10, 1996 – Broadlands Area – Flash Flood***
  The NCDC states that an intense chain of thunderstorms dumped in excess of four inches of water in a three hour period over southern portions of Champaign County. Five houses in Broadlands sustained major damage, and 29 homes sustained minor damage. The local high school was also inundated with water and sustained damage. Several roads were flooded and access to Broadlands was cut off for several hours. Portions of Highways 49 and 130 were also closed for several hours. There were no injuries sustained in this event, but the property damage was estimated at $200,000.

- ***May 19, 1998 – Broadlands Area – Flash Flood***
  A series of thunderstorms moved across southeast Champaign, southern Vermilion, and northern Edgar Counties over a three-hour period. The storms dropped between 2.5 and 5 inches of rain during this time, which resulted in numerous roads in the area being flooded. In Broadlands, the school had a couple of inches of standing water, and one of the school's storage buildings had a foot of water in it. A grocery store and two houses in the town were also damaged. Further, water damaged the local grain elevator, as a couple of motors on the drying equipment for the elevator were destroyed. The total damage in Champaign County was estimated at $80,000; no injuries were reported.

- ***August 3, 1998 – Thomasboro – Flash Flood***
  According to the NCDC, a series of thunderstorms moved across northern Champaign and Vermilion Counties. During this storm, between four and six inches of rain fell over a three-hour period. Numerous roads were flooded in the area, and several motorists had to be rescued after driving into flooded roadways. No injuries were reported.

- ***August 5, 1998 – Royal – Flash Flood***
  The NCDC records indicate that a series of thunderstorms dumped three inches of rain in a short period of time. Several roads in the Royal area were flooded. Further, three homes in the village had water in their basements. No injuries or monetary damage estimates were reported.

- ***February 24, 2001 – Countywide – Flash Flood***
  The NCDC states that local officials reported having to barricade numerous roads, particularly in the northern portion of the County. No injuries or monetary damage estimates were reported.

- ***April 19, 2002 – Southeast Portion of the County – Flash Flood***
  NCDC storm events database records indicate that over six inches of rain fell in a short period of time in the southeastern portion of the County between Pesotum and Broadlands. Numerous roads in the area were flooded, and several were washed out. No structural damage or injuries were reported.

- ***May 7, 2002 – Broadlands – Flash Flood***
  There is not a lot of information available about this event. Several roads in the Broadlands area were flooded for a brief time due to heavy rains. No structural damage was reported.

- ***May 12 -13, 2002 – Champaign, Christian, Clark, Clay, Coles, Crawford, Cumberland, Douglas, Effingham, Jasper, Lawrence, Macon, Morgan, Moultrie, Piatt, Richland, Sangamon, Shelby, Vermilion Counties – Flood***
  The NCDC says that this flood event was the culmination of several days of rain. The flooding affected a large portion of the state. The southern portion of Champaign County was most impacted by this event. The Broadlands School had to put sandbags around it to keep water out of the building. East of Sidney, an elderly couple drove into a flooded section of road and had to be rescued by a nearby farmer. There is no record of injury or property damage.

- ***May 28, 2002 –City of Champaign – Flash Flood***
  The Storm Events Database records indicate that isolated thunderstorms dropped several inches of rain in a short amount of time in Sangamon, De Witt, and Champaign Counties. In the City of Champaign, several roads were flooded as a result of this storm. No property damage or injuries appear in the records.

- ***August 19, 2002 – North Portion of the County – Flash Flood***
  Up to eight inches of rain fell on the northern half of Champaign and Vermilion Counties according to the NCDC. Numerous roads were flooded. The flooding was particularly bad in the Hoopeston area in Vermilion County; three homes had water in their living areas as a result of this event. The records do not show any damage or injuries for Champaign County.

- ***August 22, 2002 – North Portion of the County – Flash Flood***
  The Storm Events Database states that between two and five inches of rain fell in a short amount of time. Numerous roads were flooded. No structures were affected, nor injuries reported.

- ***May 10, 2003 – Countywide – Flash Flood***
  NCDC records say that very heavy rains fell countywide on ground that was already saturated. Numerous roads were flooded. There is no indication of property damage or injuries.

- ***July 9, 2003 – Countywide – Flash Flood***
  Records from the storm events database indicate that very heavy rains fell for several hours across Champaign County. Many streets and roads were flooded. The Urbana Fire Department had to rescue a man from the roof of his car after he drove into a flooded underpass. No property damage or injuries were reported.

- ***June 11, 2004 – Tolono – Flash Flood***
  The storm event database indicates that heavy rains caused roads in the Tolono area to flood. The records do not report any injuries or damage to property.

- ***July 13, 2004 – Champaign and Urbana – Flash Flood***
  Streets in Champaign and Urbana flooded because of substantial rains according to the NCDC. There was no reported property damage or injuries.

- ***September 14, 2004 – City of Champaign – Flash Flood***
  According to the storm events database two to three inches of rain fell on the City of Champaign area over a short period of time. The heavy rains caused an underpass in the City of Champaign to become impassable, with three to four feet of water on the roadway. There was no indication of injuries or property damage.

- ***January 15, 2005 – Mahomet – Flash Flood***
  There is very little information available about this event. The Storm Events database states only that U.S. 150 had water flowing over the road. There is no indication about the cause of the water on the roadway, nor if there were any injuries or property damage as a result of this event.

- ***July 26, 2006 – Rantoul – Flash Flood***
  The Storm Events Database says that the U.S. Highway 136 underpass was flooded and impassable. There was also three to four inches of standing water on side streets. There was no reported property damage or injuries.

- ***July 27, 2006 – City of Champaign – Flash Flood***
  NCDC records indicate that several roads in town flooded and had to be closed, including Kirby, Neil, and Vine streets. There were no reported injuries or property damage.

Probability of Future Flood Events

Over the 15-year period from 1993, the earliest year that the NCDC storm event database provides data on flooding, through 2007, there were 21 different flood events occurring in ten different years in Champaign County. This would indicate an estimated 67% probability that there will be a flood event in the County in any given year. In this same time period, there were six different years in which there was more than one flood event in the County. This suggests that there is an estimated 40% chance that there will be more than one flood event in any year.

Hazard Profile: Extreme Heat

Extreme heat is a natural hazard with deadly potential, since it can kill by pushing the human body beyond its limits. The INHMP describes this natural hazard as follows: “Extreme heat for a region is temperatures that hover 10 degrees or more above the average high temperature for several weeks.”

Extreme heat is most dangerous to children, the elderly, and those who are sick or overweight. Heat becomes dangerous when it exceeds the body’s ability to cool itself by sweating. A condition of high humidity level plus extreme heat can cause greater strain on the human body. The combination of extreme heat and high humidity adversely affects the body’s ability to cool itself through perspiration. Table 3-8 published by FEMA contains some common heat-related terms.

Table 3-8: Extreme Heat Terms

Heat Wave	Prolonged period of excessive heat, often combined with excessive humidity.
Heat Index	A number in degrees Fahrenheit (F) that tells how hot it feels when relative humidity is added to the air temperature. Exposure to full sunshine can increase the heat index by 15 degrees.
Heat Cramps	Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe of heat related medical problems, they are often the first signal that the body is having trouble with the heat.
Heat Exhaustion	Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim's condition will worsen. Body temperature will keep rising and the victim may suffer heat stroke.
Heat Stroke	Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
Sun Stroke	Another term for heat stroke.

The National Weather Service uses the following 'extreme heat' categories for the purposes of issuing early warnings, which is important for minimizing the impacts of extreme heat:

- *Excessive Heat Outlook*: when the potential exists for an excessive heat event in the next three to seven days. An outlook is used to indicate that a heat event may develop. It is intended to provide information to those who need considerable lead time to prepare for the event, such as public utilities, emergency management and public health officials.

- *Excessive Heat Watch*: when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so, such as those in charge of implementing individual city excessive heat event mitigation plans.

- *Excessive Heat Warning/Advisory*: when an excessive heat event is expected in the next 36 hours. Both are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurrence. The warning is used for conditions posing a threat to life or property. An advisory is for less serious conditions that cause significant discomfort or inconvenience and, if caution is not taken, could lead to a threat to life and/or property.

Heat index is the perceived temperature that is felt when factoring in the air temperature and the relative humidity. Table 3-9 shows the heat index levels associated with heat-related illnesses.

Table 3-9: Heat Index and Heat Sickness

Heat Index	Possible Heat Disorders for People in Higher Risk Groups
130º or higher	Heat stroke/sun stroke, highly likely with continued exposure.
106º - 130º	Sun stroke/heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
90 º -108º	Sun stroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
80 º - 90º	Fatigue possible with prolonged exposure and/or physical activity.

Source: National Weather Service

Consequences of Extreme Heat Extreme heat poses a health risk, particularly to children and the elderly. With regard to crop damage, the combination of extreme heat and dry weather can cause significant yield losses of crops if the extreme heat conditions exist during corn pollination, or during the flowering and pod fill stages of soybean crops.

Locations Affected by Extreme Heat All of the jurisdictions and locales in the HMP planning area are at risk from extreme heat.

History and Extent of Previous Extreme Heat Occurrences The impacts of extreme weather vary from year to year. The NCDC database shows that there have been 12 heat related deaths in Central Illinois from 1996 to the present. From July 12-17, 1995, a heat wave was responsible for many fatalities. According to the INHMP, heat was listed as an underlying or contributing factor in the death of 702 individuals statewide. The INHMP ranks the risk of extreme heat to Champaign County as 'elevated', which is the median of five ranks.

Probability of Future Extreme Heat Events It is extremely difficult to predict the probability of a future extreme heat event.

Hazard Profile: Drought

Drought is defined by the *Climate Atlas of Illinois* as: "a period of abnormally dry weather sufficiently long to cause serious impacts on agriculture, water supplies, and other activities in the affected area."

Drought is a temporary climatic phenomenon which can affect small areas or entire regions. According to the INHMP, weather conditions, soil moisture, runoff, water table conditions, water quality and streamflow are all natural factors that are important in determining drought. High temperature, high wind and low relative humidity can significantly aggravate its severity. Drought is caused by a lower than average amount of precipitation over an extended period of time. There is no single universally accepted definition of drought, but the INHMP offers four operational definitions:

- *Meteorological Drought*: A period of well-below-average precipitation that spans from a few months to a few years.
- *Agricultural Drought:* A period when soil moisture is inadequate to meet the demands for crops to initiate and sustain plant growth.
- *Hydrological Drought:* A period of below-average streamflow and/or depleted reservoir storage (i.e., streamflow, reservoir and lake levels, ground water).
- *Economic Drought:* This definition deals with the supply and demand of water. Some years there is an ample supply of water and in other years there is not enough to meet human and environmental needs.

Consequences of Drought The main impacts of drought are the potential damage it can cause to crops and the reduction of water supply. Drought is threatening to Champaign County since it contains a large amount of agricultural land. A significant number of outlying rural residents in the HMP planning area rely on private water wells to shallow aquifers that are vulnerable to drought conditions. Rural residents with no alternate plan for obtaining water during a drought may need to haul water in the event their well runs dry.

Locations Affected by Drought. All of the jurisdictions and locales in HMP planning area are at risk from drought. Drought often affects geographical areas that are larger than the HMP planning area.

History and Extent of Previous Droughts In 1983, all 102 counties in the State were affected by drought, leading to a federal emergency declaration. In 1988, another drought impacted nearly half of the state, including Champaign County, causing significant crop losses in Champaign County. Champaign County was also hit by the 2005 drought, which was particularly hard on farmers, and was within the top three most severe droughts in the 112 years for which records exist. Most recently, Champaign County was included in a group of 61 counties that were declared a natural disaster area due to a drought which occurred as the result of well below average rain between April 1 and December 31 of 2007.

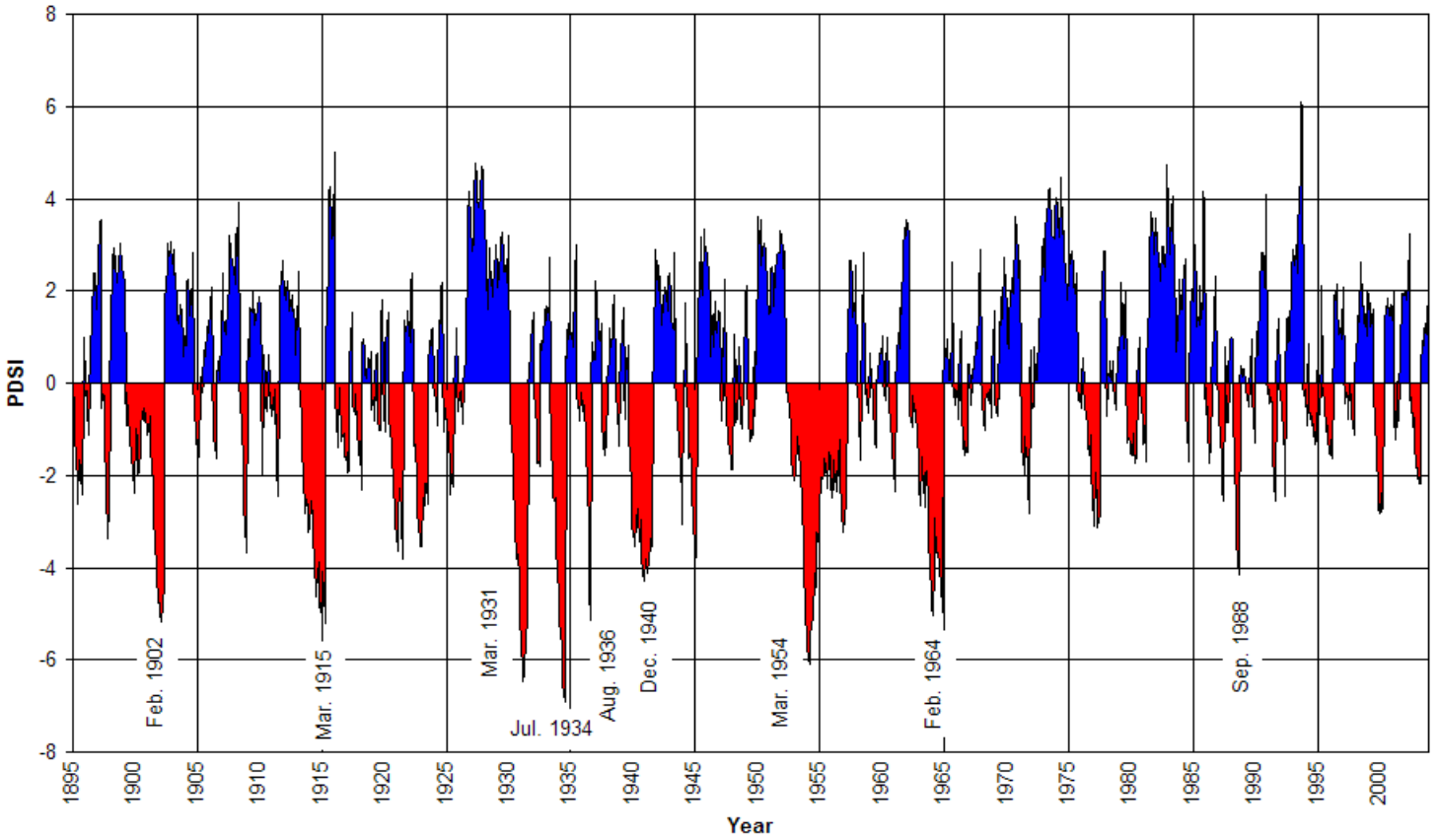
Measuring Drought Trends

The Illinois State Climatologist Office maintains a website regarding drought trends in Illinois: http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html#datadesc. The website describes the Palmer Drought Severity Index (PDSI) as a meteorological drought index used to assess the severity of dry or wet spells of weather:

> " The PDSI .. …is based on the principles of a balance between moisture supply and demand. Man-made changes were not considered in this calculation. The index generally ranges from -6 to +6, with negative values denoting dry spells and positive values indicating wet spells. There are a few values in the magnitude of +7 or -7. PDSI values 0 to -.5 = normal; -0.5 to -1.0 = incipient drought; -1.0 to -2.0 = mild drought; -2.0 to -3.0 = moderate drought; -3.0 to -4.0 = severe drought; and greater than - 4.0 = extreme drought. Similar adjectives are attached to positive values of wet spells. "

Drought trends in Illinois, including the recorded 'extreme drought' occurrences (with a PDSI value of greater than -4.0) are indicated on the Palmer Drought Severity Index for Illinois shown in Figure 3-6.

Figure 3-6: Palmer Drought Severity Index - Illinois



Source: http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html#datadesc

Probability of Future Drought Events The Illinois State Climatologist Office indicates that droughts are too difficult to forecast with present technology and available knowledge:

> "The persistence of drought from one season to the next in Illinois is not as high as in other parts of the U.S., especially the West where multi-year droughts are common. Therefore, the ability to predict the onset or continuation of a drought is more problematic. Recent advances in our understanding of large-scale atmospheric and oceanic circulation features, such as El Niño and the Pacific Decadal Oscillation, may lead to some small degree of skill in predicting drought one or two seasons ahead. On the longer scale of multi-decades, no skill has been shown in forecasting drought, even with the application of so-called drought/solar cycles. As global and regional climate models improve we may begin to realize the ability to predict changes in frequency, intensity, or location of drought."

Hazard Profile: Earthquake

Earthquakes occur when there is an abrupt shift in massive rock plates along fractures in the earth called faults. When these massive sections of rock move along a fault the energy released causes the earth to shake, potentially causing damage to structures. The point at which an earthquake occurs beneath the surface of the earth is called the hypocenter. Directly above the hypocenter on the surface of the earth is the epicenter of the earthquake.

Consequences of Earthquakes Earthquakes can cause damage to structures, injuries, and deaths. The size of an earthquake event is described in two ways: by its magnitude and intensity.

An earthquake's magnitude is a measure of the seismic energy it generates. Magnitude is often calculated using a seismograph and is reported using the Richter Scale. Richter Scale magnitude is a number between 1 and 10, followed by a decimal. The Richter Scale is a base 10 logarithmic scale, meaning a magnitude 4.0 earthquake is ten times more intense than a magnitude 3.0, and a 5.0 is ten times more intense than 4.0.

An earthquake's intensity is the measure of an earthquake's impact on people, manmade structures, and natural structures. The most commonly used intensity scale is the Modified Mercalli Intensity Scale. Table 3-10 describes the 12 levels of the Modified Mercalli Intensity scale.

Table 3-10: Modified Mercalli Intensity Scale

Mercalli Intensity	Equivalent Richter Magnitude	Witness Observations
1	1.0 to 2.0	Felt by very few people; barely noticeable.
2	2.0 to 3.0	Felt by a few people, especially on upper floors.
3	3.0 to 4.0	Noticeable indoors, especially on upper floors, but may not be recognized as an earthquake.
4	4.0	Felt by many indoors, few outdoors. May feel like a heavy truck passing by.
5	4.0 to 5.0	Felt by almost everyone, some people awakened. Small objects moved. Trees and poles may shake.
6	5.0 to 6.0	Felt by everyone. Difficult to stand. Some heavy furniture moved, some plaster falls. Chimneys may be slightly damaged.
7	6.0	Slight to moderate damage in well built, ordinary structures. Considerable damage to poorly built structures. Some walls may fall.
8	6.0 to 7.0	Little damage to specially built structures. Considerable damage to ordinary buildings, severe damage to poorly built structures. Some walls collapse.
9	7.0	Considerable damage to specially built structures, buildings shifted off of foundations. Ground cracked noticeably. Landslides.
10	7.0 to 8.0	Most masonry and frame structures and their foundations destroyed. Wholesale destruction. Large landslides.
11	8.0	Few, if any, structures standing. Bridges destroyed. Wide cracks in ground. Rails bent.
12	8.0 or greater	Total Damage. Lines of sight distorted. Objects thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move position.

Locations Affected by Earthquakes There is no history of damage caused by earthquakes in the HMP planning area. However, all of the HMP planning area is at risk from earthquake damage, should a large earthquake occur in the New Madrid or Wabash Valley Seismic Zones.

History and Extent of Previous Earthquakes According to the INHMP, there have been 31 recorded earthquakes which have caused damage in Illinois. Most of this damage occurred in Southern Illinois. While there is no history of damage, the New Madrid Seismic Zone (NMSZ) and the Wabash Valley Seismic Zone (WVSZ), depicted in Figure 3-7, are both capable of producing earthquakes which could damage property and cause injuries or fatalities in the HMP planning area. According to the Illinois State Geological Survey (ISGS), there were 41 earthquakes within a160 km radius of Champaign County. Most recently, an earthquake felt in Champaign County occurred at 4:40 AM on April 18, 2008. The earthquake measured 5.2 on the Richter Scale and originated in the WVSZ. The earthquake was felt in 16 states. A shake map of this earthquake is shown in Figure 3-8.

Probability of Future Earthquake Events
Estimates of the probability of future earthquake events within the HMP planning area in Illinois traditionally have been based on studies of earthquake activity that has occurred in the New Madrid Seismic Zone (situated southwest of Illinois) and the Wabash Valley Seismic Zones (situated along the southeastern edge of Illinois).

A regional estimate cited in the Illinois State Geological Survey 'Earthquake Facts' 1995 publication indicates the probability of future earthquake of magnitude 6.3 or greater at a non-specified Central U.S. location within the next 15 years as 40% - 63%, and 86%-97% within the next 50 years. The probability of a magnitude of 7.5 or greater at a non-specified Central U.S. location is 5% - 9% within the next 15 years, and 19% - 29% within the next 50 years.

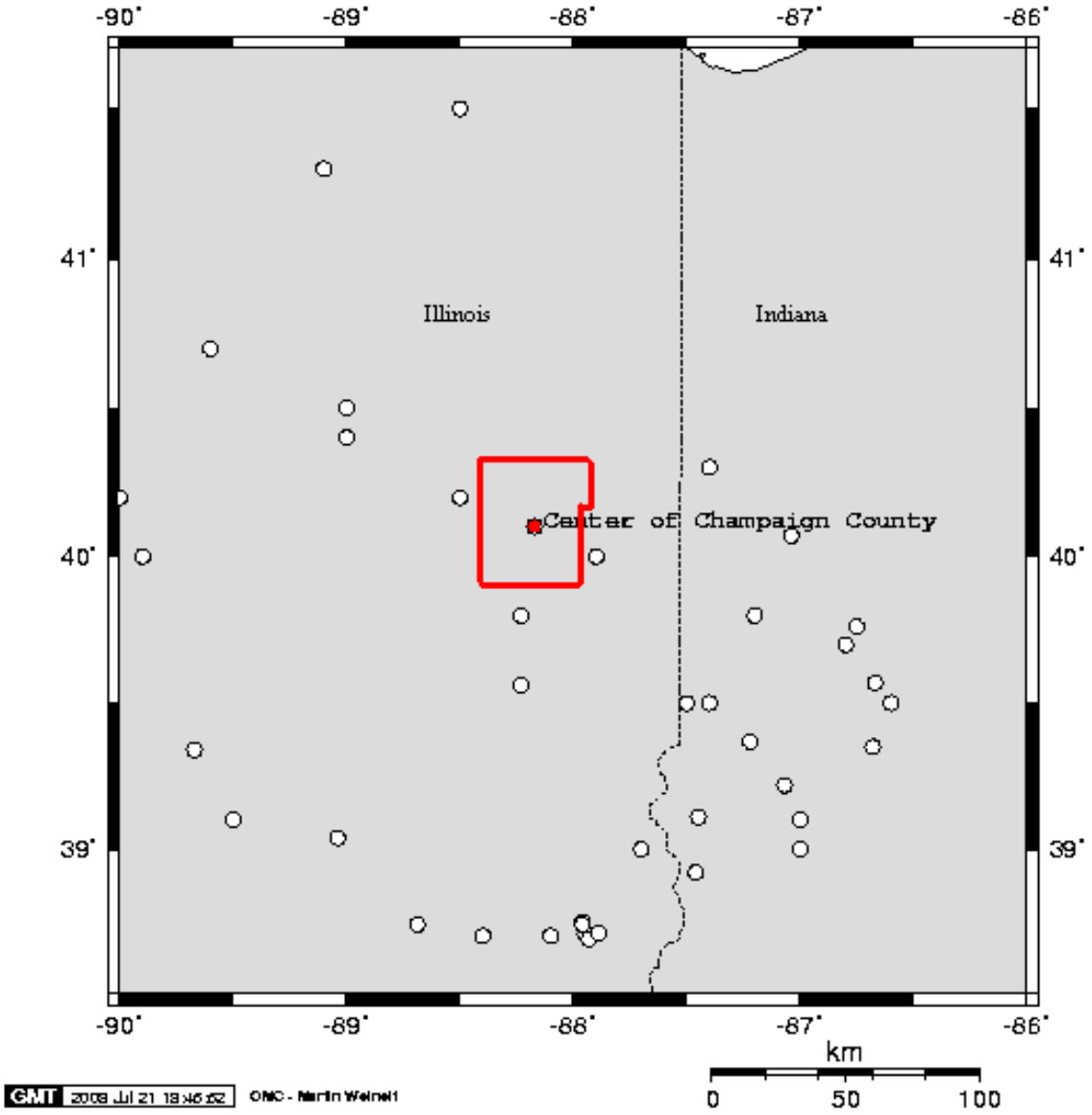
The United States Geological Survey has created a website, http://eqint.cr.usgs.gov/eqprob/2002/index.php, where one may request a customized earthquake probability map for a specific latitude and longitude or zip code. This website will provide a probability estimate based on the most currently available earthquake rate and probability models derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project.

continued on next page

Table 3-11: Earthquakes Occurring Within 160 Kilometers of Champaign County

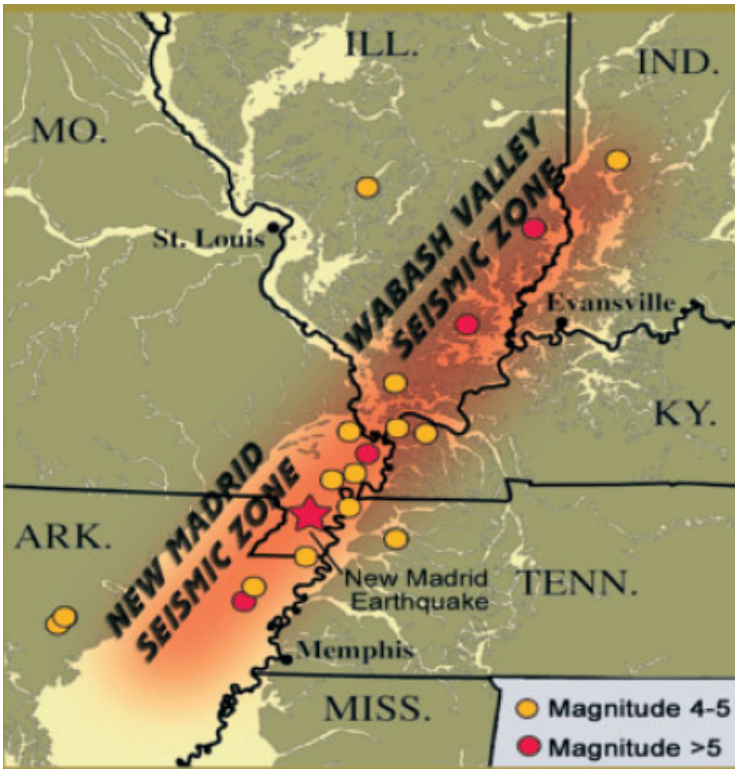
Year	Month	Day	Latitude	Longitude	Magnitude	Depth	Distance	Distance
1881	5	27	41.30	-89.10	4.6		154	96
1883	2	4	40.50	-89.00			83	52
1885	12	27	40.40	-89.00	2.9		78	48
1903	3	17	39.10	-89.50	3.0		159	99
1903	10	21	38.70	-88.10			155	96
1903	12	11	39.10	-88.50	2.5		114	71
1903	12	31	40.00	-87.90			25	16
1906	5	21	38.70	-88.40	3.4		156	97
1906	8	13	39.70	-86.80			125	78
1907	1	29	39.50	-86.60	3.4		149	93
1909	7	19	40.20	-90.00	4.5		156	97
1909	9	27	39.80	-87.20	5.4		89	55
1909	10	23	39.00	-87.70	4.2		128	80
1912	1	2	41.50	-88.50	4.7		157	98
1915	4	15	38.70	-88.10	3.8		155	96
1916	1	7	39.10	-87.00	3.8		149	93
1921	3	14	39.50	-87.50	4.5		87	54
1923	11	10	40.00	-89.90	3.3		147	91
1931	1	6	39.00	-87.00	3.5		158	98
1937	6	29	40.70	-89.60	2.5		138	86
1952	1	7	40.20	-88.50	2.9		30	19
1974	11	25	40.30	-87.40	2.4	5	69	43
1976	4	8	39.35	-86.68	3.0	20	152	94
1978	2	16	39.80	-88.23	2.7	5	33	21
1982	3	27	38.74	-88.69	2.7	15	157	98
1982	7	1	39.34	-89.67	2.6	5	153	95
1983	5	16	38.75	-87.96	2.6	20	150	93
1984	6	12	38.92	-87.46	3.4	3	144	89
1984	7	28	39.22	-87.07	4.0	10	135	84
1984	8	29	39.37	-87.22	3.2	10	114	71
1984	8	29	39.11	-87.45	3.1	10	126	78
1987	6	10	38.71	-87.95	5.1	9	155	96
1988	1	5	38.74	-87.96	3.3	5	151	94
1988	10	5	38.69	-87.93	3.6	5	157	98
1990	4	24	39.56	-88.23	3.0	10	60	37
1990	12	17	40.07	-87.04	3.2	10	96	60
1990	12	20	39.57	-86.67	3.6	10	141	88
1991	11	11	38.71	-87.89	3.8	10	155	96
1993	1	29	39.04	-89.04	3.2	5	139	86
1996	12	16	39.50	-87.40	3.1	5	93	58
2000	4	14	39.76	-86.75	3.6	5	127	79

Figure 3-7: Location of Earthquakes With Epicenters Within 160 KM of Champaign County



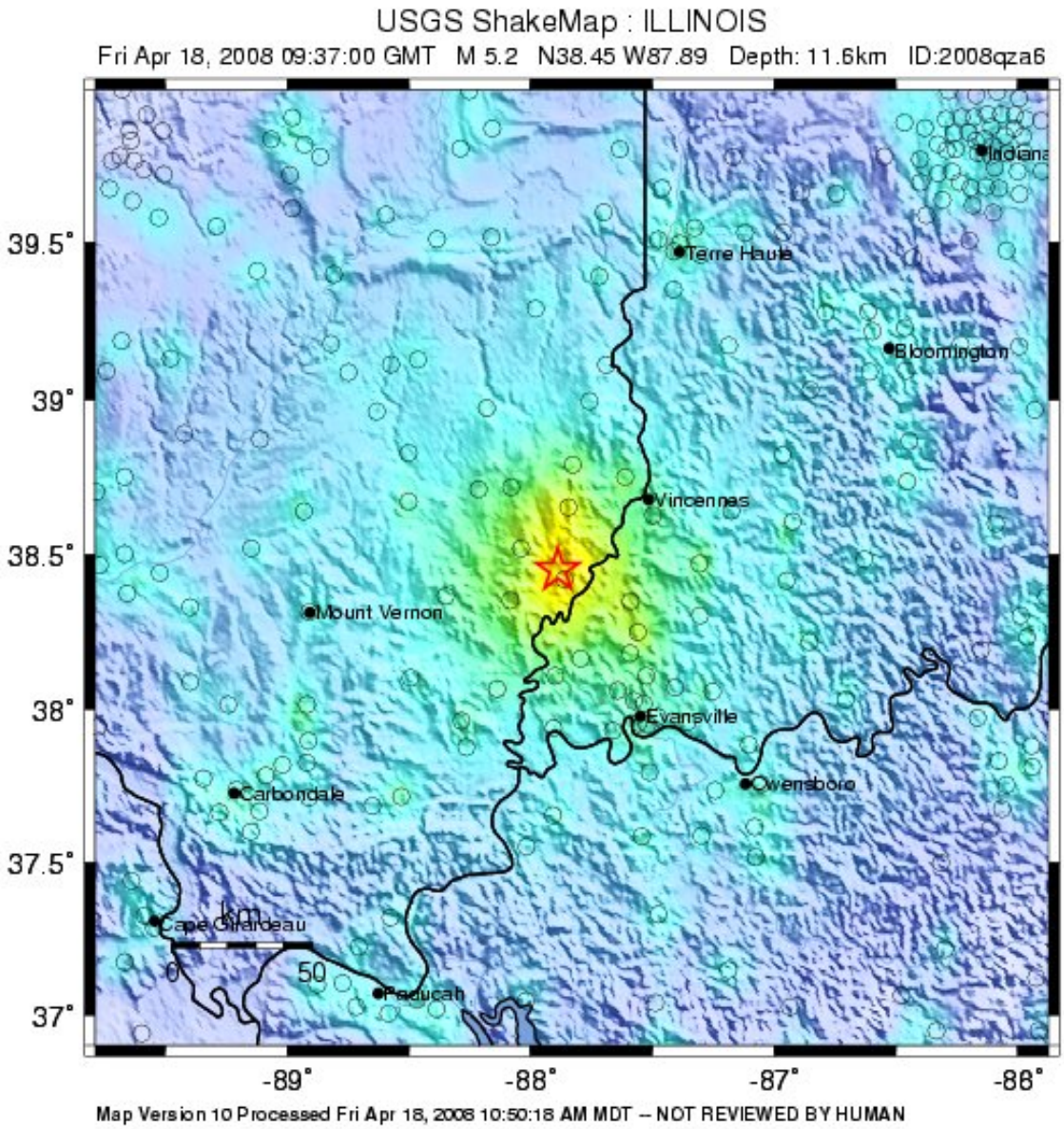
Note: Boundaries of Champaign County are approximate

Figure 3-8: New Madrid Fault Zone and Wabash Valley Fault Zone



Source: http://www.showme.net/~fkeller/quake/images2/wabashnm.jpg

Figure 3-9: Shake Map of the April 18, 2008 Earthquake



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	*8.1-16*	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Source: United States Geological Survey, http://earthquake.usgs.gov/eqcenter/shakemap/global/shake/2008qzbw/

Natural Hazard Identification By Jurisdiction

All jurisdictions in the HMP planning area are at risk for all of the natural hazards considered to be profiled in this plan, except for one type of flooding, commonly referred to as 'riverine flooding' or 'overbank flooding', which is flooding that occurs when the waters rise above the normal water line and overflow the banks of a river, stream, or channel.

The jurisdictions of Allerton, Broadlands, Foosland, Gifford, Homer, Longview, Ludlow, Ogden, Pesotum, Philo, Savoy, Thomasboro and Tolono do not contain land that is within the 100-year flood plain. There is very little chance that normally dry areas within those jurisdictions will become inundated with water from riverine flooding that results in significant damage. However, these jurisdictions may experience less damaging flooding phenomena such as ponding or flash floods. Table 3-12 summarizes the natural hazard risks for each jurisdiction participating in the Champaign County HMP.

Table 3-12: Hazard Identification by Jurisdiction

KEY:		Affects Jurisdiction
		Not a Hazard to Jurisdiction

Jurisdiction	Severe Storms	Earthquake	Floods		Severe Winter Storms	Drought	Extreme Heat
			Riverine Floods	Ponding or Flash Floods			
Village of Allerton							
Village of Bondville							
Village of Broadlands							
Champaign County							
City of Champaign							
Village of Fisher							
Village of Foosland							
Village of Gifford							
Village of Homer							
Village of Ivesdale							
Village of Longview							
Village of Ludlow							
Village of Mahomet							
Village of Ogden							
Village of Pesotum							
Village of Philo							
Village of Rantoul							
Village of Royal							
Village of Sadorus							
Village of Savoy							
Village of Sidney							
Village of St. Joseph							
Village of Thomasboro							
Village of Tolono							
City of Urbana							
UIUC*							
Parkland**							

Table 3-12 Notes:
* University of Illinois at Urbana-Champaign, located within City of Champaign and City of Urbana
** Parkland College, located within the City of Champaign

References

2007 Illinois Natural Hazards Mitigation Plan.
http://iema.illinois.gov/iema/planning/Documents/Plan_IllMitigationPlan.pdf

Angel, Jim. "Frequently Asked Questions About Drought." Illinois State Climatologist Office.
http://www.sws.uiuc.edu/atmos/statecli/Drought/drought_faq.htm 29 May 2008

"Are You Ready?" FEMA, H-34/September, 2002. Federal Emergency Management Agency.
http://www.fema.gov/areyouready/ 29 May 2008.

Brown, Kathleen J. and Sally A. McConkey. "Major Watersheds of Illinois." Illinois State Water Survey. Map Series 2000-01.
http://www.sws.uiuc.edu/iswsdocs/maps/ISWSMS2000-01.pdf

"Champaign County Tornados 1950 to 2007." National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
http://www.crh.noaa.gov/ilx/?n=champaign-tor 29 May 2008

Climate Atlas of Illinois, Stanley A. Changnon et al., Illinois State Water Survey, March, 2004

"Earthquake Occurrence in Illinois." Earthquake Facts, Illinois State Geological Survey 1995-3, 1995.

"Enhanced F Scale for Tornado Damage." Storm Protection Center, National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. http://www.spc.noaa.gov/faq/tornado/ef-scale.html. 04 June 2007

"Estimating Hail Size." National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
http://www.wrh.noaa.gov/boi/awareness/hailsize.php 29 May 2008

Federal Emergency Management Agency, Map Service Center

"Heat Wave." NOAA/PA 85001. National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
http://www.nws.noaa.gov/om//brochures/heat_wave.shtml 29 May 2008

Medina County Soil and Water Conservation District

"Modified Mercalli Intensity Scale." UPSeis: An Educational Site for Budding Seismologists. Michigan Technological University. http://www.geo.mtu.edu/UPSeis/Mercalli.html.

"Natural Hazard - Landslide." United States Geological Survey.
http://www.usgs.gov/hazards/landslides/

National Weather Service Glossary. National Weather Service, National Oceanic and

Atmospheric Administration, U.S. Department of Commerce. http://www.nws.noaa.gov/glossary/ 29 May 2008

"Observed Fire Danger Map." National Fire Danger Rating System. http://www.fs.fed.us/land/wfas/fd_class.gif

"Storm Events." National Climatic Data Center, National Environmental Satellite, Data, and Information Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms Water Management

United States Geological Survey. Earthquake Hazards Program. USGS Shakemap:Illinois http://earthquake.usgs.gov/eqcenter/shakemap/global/shake/2008qzbw/

United States Geological Survey. USGS National Seismic Hazard Mapping Project. 2002 Earthquake Probability Mapping http://eqint.cr.usgs.gov/eqprob/2002/index.php

"Understanding the Riverine Floodplain." Illinois Department of Natural Resources. http://dnr.state.il.us/owr/resman/Downloads/IL%20FPM%20Quick%20Guide.pdf

Water Management Project Office. National Aeronautics and Space Administration. http://wmp.gsfc.nasa.gov/WiringDiagrams/FlashFlood2.jpg

Chapter 4 Vulnerability Assessment

Chapter 4 includes:

- an overview summary of the HMP planning area jurisdictions' vulnerability to the natural hazards identified in this HMP, and the potential impacts of these natural hazards to the HMP planning area jurisdictions. *FEMA requirement §201.6(c)(2)(ii)*
- a description of National Flood Insurance Program insured structures that have been repetitively damaged by floods. *FEMA requirement §201.6(c)(2)(ii)*
- a description of vulnerability in terms of the types and number of existing and future buildings, infrastructure and critical facilities located in the identified hazard areas. *FEMA requirement §201.6(c)(2)(ii) (A)*
- a description of vulnerability in terms of an estimate of the potential dollar losses to identified vulnerable structures. *FEMA requirement §201.6(c)(2)(ii) (B)*
- a general description of land uses and development trends within the HMP planning area. *FEMA requirement §201.6(c)(2)(ii) (C)*

Method Used to Assess Vulnerability

The following steps were completed in order to assess the vulnerability of HMP planning area jurisdictions to the profiled natural hazards:

1. Identify and inventory categories of property that could potentially be damaged.
2. Determine the average cost per square foot and the replacement cost for potentially damaged structures.
3. Consider the potential damage caused by each type of hazard including a general description of the economic impacts.
4. Rank the vulnerability to each threat by jurisdiction.

HAZUS software was used to provide a more detailed assessment regarding vulnerability to earthquake and flood hazards (specifically, riverine flood hazard). HAZUS is a GIS-based regional loss estimation model developed by FEMA and the National Institute of Building Sciences. HAZUS allows decision makers to specify hazard parameters to see how changing the intensity, location, or duration of a hazard event will effect the damage that is caused.

Identifying Structures, Infrastructure and Critical Facilities

Inventory of Structures All structures within the HMP planning area jurisdictions fall into seven general FEMA HAZUS software categories, based on their occupancy types and uses. Data regarding structures is current as of January 1, 2007.

1. ***Residential*** This group includes single family dwellings, multi family dwellings, mobile homes, temporary lodging, institutional dormitories, and nursing homes.

2. ***Commercial*** This group includes structures used for retail trade, wholesale trade, personal and repair services, professional/technical/business services, banks, hospitals, medical offices/clinics, entertainment & recreation, theaters, and parking.

3. ***Industrial*** This group includes structures used for light industry, heavy industry, food/drug/chemical production, high technology, and construction.

4. ***Agricultural*** This group includes structures whose main purpose is to support agricultural production.

5. ***Religion*** This group includes churches and some non-profit organizations.

6. ***Government*** This group includes government buildings that provide general services as well as government emergency response agencies.

7. ***Education*** This group includes schools/libraries and colleges/universities.

Table 4-1: Number of Structures in HMP Planning Area by General Occupancy Type

	TOTAL Structures	Residential	Commercial	Industrial	Agricultural	Religion	Government	Education
REGIONAL TOTAL[1]	73,234	67,408	3,625	790	719	337	139	216
Unincorporated[2]	15,614	14,445	489	155	447	40	22	16
Village of Allerton	40	37	2	0	0	0	1	0
Village of Bondville	281	260	10	5	3	1	1	1
Village of Broadlands	231	213	10	0	4	1	2	1
City of Champaign	24,328	22,097	1,574	290	92	130	48	97
Village of Fisher	894	845	27	7	9	4	1	1
Village of Foosland	132	127	4	0	0	0	1	0
Village of Gifford	447	416	18	5	4	0	3	1
Village of Homer	671	609	36	8	7	6	3	2
Village of Ivesdale	197	182	7	3	3	0	2	0
Village of Longview	91	83	2	2	2	0	2	0
Village of Ludlow	298	288	6	0	1	1	1	1
Village of Mahomet	3,519	3,253	172	44	27	15	2	6
Village of Ogden	415	389	14	4	3	2	1	2
Village of Pesotum	293	271	7	6	6	1	1	1
Village of Philo	662	606	29	10	9	3	2	3
Village of Rantoul	5,718	5,347	251	53	22	28	4	13
Village of Royal[3]	195	187	2 (8)	1	3	0 (1)	1 (2)	1 (0)

continued

Table 4-1: Number of Structures in HMP Planning Area by General Occupancy Type continued

	TOTAL Structures	Residential	Commercial	Industrial	Agricultural	Religion	Government	Education
Village of Sadorus	231	212	10	4	1	1	2	1
Village of Savoy	1,781	1,656	89	17	7	7	2	3
Village of Sidney	571	535	18	7	5	3	2	1
Village of St. Joseph	1,692	1,600	56	13	8	8	3	4
Village of Thomasboro	623	591	14	5	7	2	3	1
Village of Tolono	1,481	1,411	38	14	8	5	2	3
City of Urbana	12,829	11,748	740	137	41	79	27	57
University of Illinois[4]								
Parkland College[4]								

Table 4-1 Notes:

1. 'Regional Total' is used instead of 'HMP Planning Area Total' because certain census tract areas used in developing the structures inventory fall outside the HMP Planning Area boundaries. Specifically, the census tract area portions situated beyond the scope of the HMP Planning Area are situated beyond the municipal boundaries of the Villages of Ivesdale in Piatt County and the Village of Allerton in Vermillion County.

2. 'Unincorporated' includes structures in unincorporated areas of Champaign County. The FEMA HAZUS software used included the census tracts in Piatt and Vermillion Counties that extend beyond the limits of the Villages of Allerton and Ivesdale. Structures within these particular census tracts but outside of Village limits are also included in the 'Unincorporated' count.

3. The HAZUS database was found to be in error with regard to the count of structures by occupancy type other than residential for the structures located within the corporate limits of the Village of Royal. (The number shown in red in parenthesis indicates a count of structures occupied by other than a residential use in the Village as of August, 2009, based on the best available information.)

4. Structures belonging to the University of Illinois and Parkland College are already counted in the municipal jurisdictions in which they are located.

Estimating Replacement Cost for Structures

The following Tables 4-2, 4-3, and 4-4 display the average replacement cost for each structure type in the HMP planning area. The average replacement cost represents an estimate of cost to replace a structure that is destroyed by a hazard event. These estimates are derived from FEMA HAZUS software and are based on *2006 RS Means Building Construction Cost Data*, a widely referenced source of construction cost data used in budgeting and estimating.

Table 4-2: Average Structure Replacement Cost by Specific Occupancy Type

	Average Cost Per Square Foot (dollars)	Average Size (square feet)	Average Replacement Cost (dollars)
Residential			
Single Family Dwelling (Refer to Table 4-3)			
Mobile Home	35.75	1,063	38,002
Multi Family Dwelling (Refer to Table 4-4)			
Temporary Lodging	132.52	135,000	18,295,200
Institutional Dormitory	150.96	25,000	3,774,000
Nursing Home	126.95	25,000	3,173,750
Commercial			
Retail Trade	82.63	110,000	9,089,300
Wholesale Trade	75.95	30,000	2,278,500
Personal and Repair Services	102.34	10,000	1,023,400
Professional/Technical/Business Services	133.43	80,000	10,674,400
Banks	191.53	4,100	785,273
Hospital	224.29	55,000	12,335,950
Medical Office/Clinic	164.18	7,000	1,149,260
Entertainment & Recreation	170.51	5,000	852,550
Theaters	122.05	12,000	1,464,600
Parking	43.72	145,000	6,339,400
Industrial			
Heavy	88.28	30,000	2,648,400
Light	75.95	30,000	2,278,500
Food/Drugs/Chemicals	145.07	45,000	6,528,150
Metals/Minerals Processing	145.07	45,000	6,528,150
High Technology	145.07	45,000	6,528,150
Construction	75.95	30,000	2,278,500
Agriculture			
Agriculture	75.95	30,000	2,278,500
Religion/Non/Profit			
Church/Membership Organization	138.57	17,000	2,355,690
Government			
General Services	107.28	11,000	1,180,080
Emergency Response	166.59	11,000	1,832,490
Education			
Schools/Libraries	115.31	130,000	14,990,300
Colleges/University Building	144.73	50,000	7,236,500

Source: FEMA HAZUS software

Table 4-3: Average Replacement Costs for Single Family Dwellings

Home Type	No Basement	Unfinished Basement	Finished Basement
	Average Replacement Cost Per Square Foot (dollars)		
1 Story Economy	65.91	73.01	85.21
2 Story Economy	70.13	74.78	81.23
3 Story Economy	70.13	74.78	81.23
Split Level Economy	64.46	69.96	78.36
1 Story Average	92.84	101.29	116.89
2 Story Average	90.15	95.60	105.70
3 Story Average	94.49	98.74	106.84
Split Level Average	84.96	91.46	103.41
1 Story Custom	114.91	130.36	154.46
2 Story Custom	112.91	122.11	135.81
3 Story Custom	116.99	123.84	133.79
Split Level Custom	105.25	116.60	133.80
1 Story Luxury	139.76	152.96	183.51
2 Story Luxury	133.09	143.19	158.84
3 Story Luxury	137.08	144.68	156.08
Split Level Luxury	124.81	137.26	156.71

Table 4-4: Average Replacement Costs for Multi-Family Dwellings

Home Type	Average Replacement Cost Per Square Foot (dollars)	Average Size (square feet)	Average Replacement Cost (dollars)
Duplex	79.48	3,000	238,440
Triplex/Quads	86.60	3,000	259,800
Apartment 5-9 Units	154.31	8,000	1,234,480
Apartment 10-19 Units	137.67	12,000	1,652,040
Apartment 20-49 Units	135.39	40,000	5,415,600
Apartment 50+ Units	131.93	60,000	7,915,800

Critical Facilities Critical facilities are buildings or infrastructure considered as vital to protect from the adverse impacts of a natural hazard by means of mitigation. Within the HMP planning area, if a facility met one or more of the following criteria, it was identified as a critical facility:

- a facility which is essential to managing and responding to a hazard event;
- a facility which houses or contains vulnerable populations, specifically children or the elderly;
- a large place of assembly; or
- a facility that contains hazardous materials.

The facilities within the HMP planning area that are considered critical are listed in their general categories as follows:

Essential Facilities
Emergency Facilities, including: Police Stations; Fire Stations; Hospitals; Emergency Management Agencies / Emergency Service & Disaster Agencies

Utility Lifelines
Potable Water Facilities (e.g., water tower, public well station); Waste Water Facilities (e.g., public sewage treatment plant); Electrical Substations; Natural Gas Facilities; Natural Gas Pipelines; Radio & Television Stations

Transportation Lifelines
Railway Facilities & Railway Bridges; Bus Facilities; Highway Bridges & Highway Tunnels; Airports; Heliports

High Potential Loss Facilities
Military Installations; Dams & Levees; Hazardous Material Facilities

Facilities of Local Importance
Schools (excluding residential home schools); Day Care Centers; Nursing Homes; Retirement, Assisted and Supported Living Facilities; Subsidized Senior Apartments; Senior Centers; Libraries; Movie Theaters; Stadiums; Correctional Facilities; Selected Government Buildings

The following table displays a count for the number of each type of critical facility identified in each jurisdiction that participated in HMP planning.

continued on next page

Table 4-5: Number of Critical Facilities by Jurisdiction

	Essential Facilities	Utility Lifelines	Transportation Lifelines	High Potential Loss Facilities	Facilities of Local Importance	Total Count of Critical Facilities
REGIONAL TOTAL[1]	74	83	843	18	223	1241
Unincorporated [2]	0	1	700	0	0	701
Village of Allerton	1	0	0	0	1	2
Village of Bondville	1	1	0	0	0	2
Village of Broadlands	1	1	2	0	1	5
City of Champaign	27	10	62	7	80	186
Village of Fisher	2	3	11	0	5	21
Village of Foosland	0	0	0	0	0	0
Village of Gifford	2	1	0	1	4	8
Village of Homer	3	2	1	1	4	11
Village of Ivesdale	1	1	2	1	0	5
Village of Longview	0	1	0	0	1	2
Village of Ludlow	1	1	1	0	2	5
Village of Mahomet	6	6	14	0	13	39
Village of Ogden	0	1	1	0	3	5
Village of Pesotum	0	1	2	0	1	4
Village of Philo	0	2	0	0	3	5
Village of Rantoul	6	23	9	0	30	68
Village of Royal	1	1	0	1	2	5
Village of Sadorus	1	1	1	1	1	5
Village of Savoy	1	6	1	0	10	18
Village of Sidney	2	2	5	1	2	12
Village of St. Joseph	2	3	4	0	8	17
Village of Thomasboro	2	1	4	0	3	10
Village of Tolono	3	1	1	1	9	15
City of Urbana	14	12	24	6	46	102
University of Illinois[3]						811
Parkland College[4]						10

Table 4-5 Notes:

1. The Regional Total does not include the critical facilities of the University of Illinois or Parkland College. Refer to Notes 3 and 4 below.
2. "Unincorporated" includes structures in unincorporated areas of Champaign County. Additionally some census tracts in Piatt and Vermillion Counties include, but extend beyond the limits of the Villages of Allerton and Ivesdale. The structures within these census tracts but outside of village limits are included in the "Unincorporated" count.
3. The University of Illinois is an overlay jurisdiction. All of the University of Illinois' 811 structures, sites and buildings are considered critical facilities. These facilities are excluded from the counts for the municipalities in which they are located.
4. Parkland College is a jurisdiction that overlays the City of Champaign. The 10 critical facilities associated with Parkland College are excluded from the City of Champaign counts.

Data Limitations

Digital Flood Insurance Rate Maps (DFIRMs) The HMP was prepared knowing that a data limitation for assessing vulnerability to flood hazards will need to be addressed in the next HMP update. DFIRMs for jurisdictions within the HMP planning area that participate in FEMA's National Flood Insurance Program (NFIP) are presently being updated and are expected to be available during the year 2010. The forthcoming DFIRM data will include up-to-date elevations of land along the Boneyard Creek. These elevations are included on a map revision (referred to as a 'Letter of Map Revision, or 'LOMAR') recently submitted to FEMA by the Cities of Champaign and Urbana. The updated elevations to be featured on the DFIRMS will allow for more accurate vulnerability assessment to flood hazards in the City of Champaign and City of Urbana.

Accurate Count of Structures within 100-Year Floodplain The FEMA HAZUS computer model bases its estimate of the number of structures impacted by the 100-year floodplain hazard on each census block and not actual placement of the structure in the 100-year floodplain. This broader inclusion of structures represents a potentially greater number of structures reported as impacted by the 100-year floodplain flood hazards. The actual number of structures located within the 100-year floodplain areas within the HMP planning area is somewhat less than the number of structures located within the census blocks that include 100-year floodplain areas.

The estimates of potential loss related to flood damages, therefore, are general estimates that are more inclusive than exclusive of structures in the area of the 100-year floodplain.

Repetitive Loss Properties

This section addresses repetitive losses on properties in identified flood hazard areas within the HMP planning area. 'Repetitive loss structure' is a term used by the National Flood Insurance Program (NFIP) to refer to a structure for which two or more losses of at least $1,000 have been paid under the NFIP within any 10-year period since 1978.

Available data regarding repetitive loss structures in the HMP planning area is dated June 30, 2008. FEMA Guidance specifies that flood insurance claim information is subject to The Privacy Act of 1974, as amended. The Act prohibits public release of policy holder names, or names of financial assistance recipients and the amount of the claim payment or assistance. Based on this data, Table 4-6 displays the types and quantity of repetitive loss structures in the HMP planning area.

Table 4-6: Repetitive Loss Structures

Type of Structure	Number of Structures	Location (within or nearby the jurisdiction shown below)
Single Family Residence	1	Village of Broadlands
	2	City of Champaign
	1	Village of Fisher
	2	Village of Sidney
	2	Village of St. Joseph
Other Type of Residential	3	City of Champaign
Multi-Family Residential	3	Village of St. Joseph
Non Residential	3	City of Champaign

As noted in the previous section, the DFIRMs for jurisdictions within the HMP planning area that participate in FEMA's National Flood Insurance Program (NFIP) are presently being updated and are expected to be available in the year 2010. Once the DFIRM are available, it is expected that some of the above-noted repetitive loss properties may no longer be located within the 100-year floodplain (also known as the 'special flood hazard area').

Vulnerability Assessment: Severe Storms

All structures and people within the HMP planning area are vulnerable to severe storms. Severe storms can produce lightning, hail and tornados, which can cause damage in a variety of ways. These elements of severe storms are discussed below.

Vulnerability Assessment: Lightning

Potential Health and Safety Threat Lightning could strike anyone who is outside during a severe storm. Lightning has the capability to injure or kill any person who is struck. It also has the capability of traveling through electrical outlets and striking people and objects indoors. Lightning strikes can also cause fires which pose safety risks.

Potential Damage to Property All structures within the HMP planning area are vulnerable to lightning. The Chapter 2 hazard profile for damaging lightning indicates a seven percent chance that there will be a lightning strike which causes damage in the HMP planning area in any given year. Lightning strikes can cause fires which could completely destroy a structure. Therefore, the maximum potential damage to a structure from lightning should be the replacement cost of the entire structure. Average replacement costs for each of the seven structural types are provided in Tables 4-2; 4-3; and 4-4.

Potential Economic Impacts The types of potential economic impacts that can result from damaging lightning strikes in the HMP planning area are described below:

- Cost of emergency response and cleanup as a result of a lightning damage;
- Loss of revenue for an economic establishment that is destroyed by fire from a lightning strike;
- Loss of revenue for economic establishments whose power service is interrupted as a result of lightning causing tree limbs to fall on power lines; or
- Disruption of transportation routes as a result of downed tree debris.

Vulnerability Assessment: Hail

Potential Health and Safety Risk Hail can injure anyone who is outside during a severe storm in any of the HMP planning area jurisdictions. Although hail is not generally life-threatening, it can cause injury if a person is struck.

Potential Damage to Property The Chapter 2 hazard profile for hail storms indicates that, based on historical data, there is a 62 percent chance that there will be a severe storm which produces hail anywhere within the HMP planning area in any given year. Hail most frequently causes damage to automobiles. The potential damage associated with hail striking vehicles includes: dents to the vehicle's body; scratched paint; and broken windshields and windows.

Each of these types of damage could cause significant repair costs. In severe cases, hail can also cause damage to structures. Hail can dent or cause soft spots in the roofs of buildings with shingles, which could lead to water damage. Hail can also break out windows on structures.

Potential Economic Impacts The types of potential economic impacts that can result from a hail storm in the HMP planning area are described below:

- Loss of revenue for economic establishments while they repair broken windows and or/roofs;
- Loss of revenue for economic establishments which depend on vehicles that are rendered inoperable as the result of broken windows; or
- Crop damage.

Vulnerability Assessment: Tornados

Potential Health and Safety Risk Tornados are capable of causing injury or the death of people living in any of the HMP planning area jurisdictions. The high-speed winds associated with tornados can: throw a person a long distance; strike a person with ordinary objects that are turned into projectiles; or cause a structure occupied by a person to collapse.

Potential Property Damage All structures situated within the HMP planning area are vulnerable to tornados. The Chapter 2 hazard profile for tornados indicates that, based on historical data, there is a 47 percent chance that there will be a severe storm which produces a tornado in the County in any given year.

A tornado can completely destroy vehicles as well as structures. Manufactured housing, homes on crawlspaces, and structures with large spans, such as factories or malls, are at heightened risk for damage from tornados because of their structural characteristics. However, an F-4 or F-5 magnitude tornado is capable of destroying any structure. Therefore, the maximum potential damage to a structure from a tornado should be the structure's replacement cost. Average replacement costs for each of the seven structural types are provided in Tables 4-2; 4-3; and 4-4.

The Illinois Natural Hazard Mitigation Plan (INHMP) estimates that Champaign County will lose an average of nearly $800,000 in property damage to tornados in any given year. To arrive at this estimate, the historical number of tornados (44) was divided by the number of years between 1950 and 2002 (53) yielding a probability of 0.83 that a tornado will occur in Champaign County in a given year. Then, the total dollar value of the damage reported from all 44 tornados (41.973 million) was divided by 44 to create an average monetary damage per tornado. By multiplying this average damage per tornado figure by the probability of .83, the INHMP arrived at their estimate of approximately $800,000 in tornado damage for Champaign County in any given year. This estimate based on historical damage data places Champaign County as fifth in the state for highest estimated yearly property damage from tornados behind Will, Williamson, Cook, and Madison Counties, respectively.

Potential Economic Impacts The types of potential economic impacts that can result from a tornado in the HMP planning area are described below:

- Financial hardships endured by survivors as a result of loss of lives as result of a tornado
- Financial hardships due to personal or animal injuries resulting from a tornado
- Cost of emergency response and cleanup as a result of tornado damage
- Loss of revenue for economic establishments that are damaged or destroyed by a tornado

- Loss of revenue for economic establishments whose utility services are interrupted as a result of a tornado
- Disruption of transportation routes as a result of debris

Vulnerability Assessment: Severe Winter Storms

Potential Health and Safety Risks Winter storms, particularly the heavy snow fall and the cold temperatures associated with them, can cause injury or death. All residents of the County and its jurisdictions are potentially vulnerable to the effects of winter storms. These storms can include extremely low temperatures which can cause injury or death if a person has prolonged exposure to the cold.

Winter storms can also have accumulations of snow and/or ice which can cause roads to be slick and extremely dangerous for travel. Vehicular accidents are commonplace after winter storms which produce significant amounts of ice and snow. These storms can also involve blizzards which reduce visibility and make travel dangerous.

Potential Damage to Property All of the structures in the County and its jurisdictions are exposed to winter storms. Chapter 2 states that there is a 87% chance that there will be a winter storm in the County in any given year. When temperatures are below zero, water pipes can freeze and burst causing costly water damage to buildings. Ice storms can cause build ups of ice which destroy trees and cause damage to overhead electrical power lines.

Potential Economic Impacts

- Costs of clearing roads of snow and ice
- Cleanup costs of trees downed in ice storms
- Repair costs of electrical utility lines downed in ice storms
- Loss of revenue for economic establishments whose power service is interrupted as a result of ice or snow storms
- Disruption of transportation routes

Vulnerability Assessment: Floods

The vulnerability assessment of the HMP planning area jurisdictions to flood hazards was also generated by using FEMA's HAZUS software. The vulnerability assessment was conducted under the scenario that a 100-year flood event takes place in the HMP planning area.

HMP Planning Area Flood Vulnerability Assessment

The following assessment considers all the structures and property within the boundaries of the HMP planning area. Additionally, some census tracts in Piatt and Vermilion Counties include, but extend beyond the limits of the Villages of Allerton and Ivesdale. The structures within these census tracts, but outside of village limits, are included in the regional analysis, but are not included in the municipal specific numbers.

Building Damage HAZUS estimates that about 830 buildings will be at least moderately damaged in a 100 year flood event. This is over 1% of the total number of buildings in the region. Table 4-7 below summarizes the expected damage by occupancy for the buildings in the region. Table 4-8 summarizes expected damage by building type.

Table 4-7: Expected Regional Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	Total
Agriculture	0	0	0	0	0	0	0
Commercial	0	3	0	0	2	0	5
Education	0	0	0	0	0	3	3
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	1	1
Religion	0	0	0	0	0	0	0
Residential	0	2	13	45	124	636	820
Total	0	5	13	45	126	640	829

* - Substantially damaged means greater than 50% of the building has been damaged

Table 4-8: Expected Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	Total
Concrete	0	0	0	0	0	1	1
Manufactured Housing	0	0	0	0	0	59	59
Masonry	0	1	0	3	16	86	106
Steel	0	1	0	0	0	1	2
Wood	0	2	13	42	108	493	658
Total	0	4	13	45	124	640	826

* - Substantially damaged means greater than 50% of the building has been damaged

Building Related Economic Losses Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

Within the HMP planning area, the total building-related losses are an estimated $533.73 million. Less than 1% of the estimated losses were related to the business interruption. Residential occupancies made up 59.32% of the total loss. Table 4-9 provides a summary of the losses associated with the building damage in the HMP planning area.

continued on next page

Table 4-9: Building Related Economic Loss Estimates
(Millions of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	206.36	34.07	5.08	27.76	273.28
	Content	109.77	62.07	8.83	73.26	253.92
	Inventory	0.00	1.33	1.46	0.89	3.68
	Subtotal	316.14	97.47	15.36	101.91	530.88
Business Interruption						
	Income	0.03	0.40	0.00	0.10	0.52
	Relocation	0.23	0.09	0.00	0.00	0.32
	Rental Income	0.14	0.06	0.00	0.00	0.19
	Wage	0.06	0.43	0.00	1.33	1.82
	Subtotal	0.45	0.97	0.00	1.43	2.85
ALL	**Total**	**316.59**	**98.43**	**15.36**	**103.34**	**533.73**

Critical Facility Damage In total, 20 critical facilities out of the 1,241 in the HMP planning area are projected to sustain damage in the 100 year flood event. Table 4-10 provides a count for the number of critical facilities damaged in each category.

Table 4-10: Count of Damaged Critical Facilities

Critical Facility Type	Number Damaged
Essential Facilities	1
Transportation Lifelines	12
Utility Lifelines	4
High Potential Loss Facilities	0
Facilities of Local Importance	4
TOTAL within HMP Planning Area	**20**

Essential Facilities HAZUS estimates that there will be some damage to one essential facility in the HMP planning area. An emergency operations center located in Sidney is projected to sustain heavy damage totaling approximately 1.5 million dollars. This facility will be non-functional and will not be fully restored for an estimated 630 days. There is no projected damage to police, fire department, or hospital facilities in any of the jurisdictions.

Transportation and Utility Lifelines A 100 year flood event also has the potential to damage transportation and utility lifelines. The estimated damage to transportation infrastructure is minimal. The only projected damage to transportation infrastructure is a small amount of damage to highway bridges. HAZUS estimates this damage to be around $8,000. The projected damage to utility infrastructure within the County will affect wastewater facilities. The HAZUS model projects that four wastewater facilities will be rendered temporarily inoperable and will sustain an estimated total of $103,419,000 in damages. These four facilities include the sewage treatment plants in Fisher, both sewage treatment plants in Mahomet, and the Northeast plant in Urbana.

High Potential Loss Facilities None of the high potential loss facilities located in the County and the participating jurisdictions are projected to sustain damage as a result of this flood event.

Facilities of Local Importance HAZUS predicts that four facilities of local importance in the County will be damaged in this flood event. Three of the facilities, including a pre-school, a high school, and another educational facility are located in Urbana. The fourth facility is a nursing home located in Champaign.

Debris Generation HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of equipment required to handle the debris. The model estimates that a total of 116,870 tons of debris will be generated. Of the total amount, finishes comprises 24% of the total, structure comprises 45% of the total, and foundations comprise the remaining 31%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4,675 truckloads carrying 25 tons each to remove the debris generated by the flood.

Shelter Requirements HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2,668 households including 8,005 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 5,707 people (out of a total 2000 population of 186,470) will seek temporary shelter in public shelters.

The number of 2,668 households appears to be a high estimate when compared with the 820 residences that will be damaged in the flood. However, an important component in the HAZUS methodology for calculating shelter needs is not only damage to residences, but damage to utility infrastructure. In this scenario, four wastewater treatment plants have become inoperable, which means that some of the households that these plants serve will need to seek shelter elsewhere.

Jurisdiction-Specific Vulnerability Assessments Flood hazards from a 100-year flood event do not threaten all of the jurisdictions in the HMP planning area. The HAZUS model predicts that the following jurisdictions will sustain damage in a 100-year flood event:

Village of Bondville	Village of Royal
City of Champaign	Village of Sadorus
Village of Fisher	Village of Sidney
Village of Foosland	Village of St. Joseph
Village of Ivesdale	City of Urbana
Village of Mahomet	Parkland College
Village of Rantoul	University of Illinois at Urbana-Champaign
	Champaign County

Appendix 3 contains a description of vulnerability to 100-year flood hazards for each of the above noted jurisdictions. Appendix 3 includes a description of the estimated damage to each jurisdiction and a map which shows municipal boundaries and the census blocks which contain areas within the 100 year flood plain. HAZUS analyzes and calculates damage to these blocks when it produces its estimates. These blocks do not in all cases line up exactly with the municipal boundaries of the jurisdiction.

Vulnerability Assessment: Extreme Heat

Potential Health and Safety Risks All of the residents in the HMP planning area are vulnerable to extreme heat. As Chapter 2 states, extreme heat can cause ill effects ranging from fatigue, to heat cramps, to sun stroke, to death. Elderly populations and small children are at a heightened vulnerability to the effects of extreme heat.

Potential Damage to Property
Extreme heat does not usually damage structures. However, prolonged periods of extreme heat can damage crops.

Potential Economic Impacts
The potential economic impacts include heightened energy demands and utility costs to cool structures during periods of extreme heat.

Vulnerability Assessment: Drought

Potential Health and Safety Risks Droughts do not traditionally pose health and safety risks.

Potential Damage to Property Droughts do not pose a threat to structures in the HMP planning area, but droughts have the capability of causing damage to crops. It is impossible to reliably predict the probability that drought will affect the region, however as Chapter 2 states, there have been droughts in the region in the past. All of the agricultural lands in the HMP planning area are vulnerable to drought.

Potential Economic Impacts
The potential economic impacts include the loss of revenue for farmers whose crops are destroyed by drought.

Vulnerability Assessment: Earthquakes

FEMA HAZUS software allowed for a detailed analysis of the vulnerability of the HMP planning area jurisdictions to earthquakes. HAZUS was utilized in preparing the following earthquake vulnerability analyses.

For comparative purposes, two scenarios were analyzed to assess the HMP planning area's vulnerability to earthquake damage. For the first scenario all of the historic sites of earthquakes near Champaign County were identified. HAZUS then estimated the effects of a Magnitude 5.4 earthquake occurring at the historic location of the nearest previously occurring earthquake to Champaign County. This earthquake occurred in 1909 in southwestern Vermillion County; the epicenter of this earthquake was located at a latitude of 39.80 N and a longitude of -87.20 W, approximately 39 miles east of Champaign County.

The second scenario estimated the effects of a Magnitude 5.4 earthquake occurring along the fault at the Wabash Valley Fault Zone, with the epicenter of this earthquake located at a latitude of 38.00 N and a longitude of -88.20 W. The closest point of this fault zone would be located approximately 106 miles south of Champaign County.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County

Casualties The HAZUS model indicates four possible categories of 'Injury Severity' due to an earthquake. Each of these injury categories is described in Table 4-11.

Table 4-11: HAZUS Injury Severity Definitions

Injury Severity	Injury Description
Severity 1	Injuries requiring basic medical aid without requiring hospitalization
Severity 2	Injuries requiring a greater degree of medical care and hospitalization, but not expected to progress to a life threatening status
Severity 3	Injuries that pose an immediate life threatening condition if not treated adequately and expeditiously. The majority of these injuries are a result of structural collapse and subsequent collapse or impairment of the occupants.
Severity 4	Instantaneously killed or mortally injured

Source: HAZUS User Manual

The HAZUS model provides casualty estimates for the Scenario 1 earthquake occurrence at three different times of day: at 2:00 AM, 2:00 PM, and 5:00 PM. The estimate regarding casualties does not vary greatly across the different time scenarios. Regarding the 2:00 PM time scenario, the model predicts that a total of 3 people within the HMP planning area will sustain category 'Injury Severity 1' injuries as a result of the earthquake.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued….

Building Damage The FEMA HAZUS model provides an estimate for the number of buildings of each construction type that will be damaged in the earthquake. Further, the model puts these damaged buildings into four damage categories: Slight; Moderate; Extensive; and Complete. The definition of each of these damage categories varies depending on the type of construction.

Table 4-12 provides a sample of definitions for damage to wood, light frame buildings. Table 4-13 provides a count both by construction type and by damage level of the number of buildings that will be damaged in the earthquake in the HMP planning area.

Table 4-12: Example Damage Category Definition for Wood, Light-Frame Buildings

Damage Level	Damage Description
Slight	Small plaster or gypsum board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations; small foundations cracks.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS User Manual

Table 4-13: Building Damage Count by Severity and Type

	Number of Buildings for Each Damage Level				
Building Type	Slight	Moderate	Extensive	Complete	TOTAL
Wood	101	8	0	0	109
Steel	5	1	0	0	6
Concrete	7	1	0	0	8
Precast	2	1	0	0	3
Reinforced Masonry	1	0	0	0	1
Unreinforced Masonry	264	87	11	1	363
Manufactured Home	92	22	0	0	114
Region Total	**472**	**120**	**11**	**1**	**604**

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued….

Building-Related Economic Losses Table 4-14 displays the estimated economic losses associated with buildings and their activities that will occur as a result of the earthquake.

Table 4-14: Building-Related Economic Losses
(Values in Millions)

	Structural Damage Cost	Non-Structural Damage Cost	Content Damage Cost	Inventory Loss	Relocation Loss	Capital Related Loss	Wage Losses	Rental Income Loss	TOTAL
Region Total	$ 1.70	$ 2.88	$ 0.69	$ 0.02	$ 0.04	$ 0.37	$ 0.55	$ 0.59	$ 6.83

Critical Facility Damage

Essential Facilities Table 4-15 shows the number of essential facilities and the predicted functionality of these facilities the day after the earthquake.

Table 4-15: Functionality of Essential Facilities at Day One

Type of Facility	Number of Facilities	Functionality % at Day One
Police Station	18	100.0
Hospital	See Table 4-16 below	
Emergency Operation Centers	7	100.0
Fire Station	56	100.0

Table 4-16 displays the total estimated number of beds for the hospitals in the region, as well as the number of beds estimated to be available at certain milestone dates after the earthquake.

Table 4-16: Functionality of Hospitals

		At Day 1		At Day 3		At Day 7		At Day 30		At Day 90	
	Total # of beds	# of beds	%	# of beds	%	# of beds	%	# of beds	%	# of beds	%
Large Hospitals	657	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0
Small Hospitals	46	46	100.0	46	100.0	46	100.0	46	100.0	46	100.0
Region Total	703	703	100.0	703	100.0	703	100.0	703	100.0	703	100.0

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued….

Utility Lifelines Table 4-17 displays the estimated damage states for the potable and wastewater facilities.

Table 4-17: Wastewater and Potable Water Facility Damage

	Percentage of Facilities in Each Damage State				
Type of Facility	# of Facilities	None	Slight	Moderate to Extensive	Complete
Wastewater	16	84%	11%	0%	0%
Potable water	47	43%	25%	0%	0%

There are 5,736 kilometers of potable water pipeline in the region. HAZUS estimates that there will be two leaks as a result of the earthquake. There are 3,422 kilometers of waste water pipelines. The model estimates one leak in waste water pipes. HAZUS does not predict that any households will be without water after this event.

Table 4-18 evaluates the earthquake's effect on electrical power system performance in terms of households without power.

Table 4-18: Households Without Power

Total Households	At day 1	At day 3	At day 7	At day 30	At day 90
73,282	0	0	0	0	0

The following chart summarizes the expected economic cost of the damage to the various utility systems in the HMP planning area.

Table 4-19: Estimated Direct Economic Losses for Utilities
(Values in Millions)

	Potable Water	Waste Water	Oil System	Natural Gas	Electric Power	Communication	Total
Region Total	$1.38	$ 0.58	$ 0.00	$ 0.01	$ 0.49	$ 0.00	$ 2.47

Transportation Lifelines The HAZUS model predicts moderate damage to transportation lifelines in the HMP planning area. Table 4-20 summarizes the estimated damage to the transportation facilities.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued….

Table 4-20: Estimated Direct Economic Losses for Transportation Lifelines
(Values in Millions)

	Highway	Railway	Bus Facility	Airport	Total
Segments	$ 0	$ 0.00	-	-	
Bridges	$ 0	$ 0.00	-	-	
Facilities	$ 0	$ 0.02	$ 0.05	$ 1.49	
Region Total	$ 0	$ 0.02	$ 0.10	$ 1.50	$ 1.60

High Potential Loss Facilities and *Facilities of Local Importance* The HAZUS methodology does not allow for the estimation for high potential loss facilities and Facilities of Local Importance, as these are unique across different locales, and HAZUS does not attempt to predict average characteristics for these facilities as it does with residences or other types of structures.

Debris Generation
The HAZUS model predicts that the earthquake will not generate a significant amount of debris.

Fires Following the Earthquake
HAZUS estimates that there will be no small or large fires after the earthquake.

Shelter Requirement
HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates six households to be displaced due to the earthquake. Of these, 1 person (out of a total (2000) population of 186,470) will seek temporary shelter in public shelters.

Scenario 2: Magnitude 5.4 in the Wabash Valley Fault Zone

Casualties The HAZUS model provides casualty estimates for three different scenarios in which the earthquake occurs at: 2:00 AM, 2:00 PM, and 5:00 PM. The casualties do not vary greatly across the different time scenarios. The HAZUS model predicts that no one in the region will be injured as a result of the earthquake.

Building Damage and Building-Related Economic Losses The model provides an estimate for the number of buildings of each construction type that will be damaged in the earthquake. The HAZUS model predicts no significant amount of building damage as a result of the earthquake. The HAZUS model predicts no significant amount of estimated economic losses associated with buildings in the HMP planning area and their activities that will occur as a result of the earthquake.

Critical Facility Damage

Essential Facilities The HAZUS model predicts that all essential facilities in the HMP planning area will be functioning at 100% one day after the earthquake.

The HAZUS model estimate of the total number of beds for the hospitals in the HMP planning area, and the number of beds to be available at certain milestone dates after the earthquake. The Scenario 2 Earthquake is expected to have no impact on the number of available beds in the region.

Utility Lifelines There are 5,736 kilometers of potable water pipeline in the HMP planning area. The HAZUS model predicts no significant damage to the potable facilities. There are 3,422 kilometers of waste water pipelines. The model estimates no significant damage to the waste water facilities. The model predicts that there will not be any households without electric power as a result of the earthquake.

The HAZUS model assigns no significant economic cost as a result of damage to the various utility systems in the HMP planning area as a result of the Scenario 2 Earthquake.

Transportation Lifelines The HAZUS model predicts no significant damage to transportation lifelines in the region, and assigns no significant economic cost as a result of damage to transportation lifelines in the region.

High Potential Loss Facilities and *Facilities of Local Importance* The HAZUS methodology does not allow for the estimation for high potential loss facilities. High potential loss facilities are unique across different locales, and HAZUS does not attempt to predict average characteristics for these facilities as it does with residences or other types of structures.

Debris Generation
The model predicts that the earthquake will not generate a significant amount of debris.

Fires Following the Earthquake
HAZUS estimates that there will not be any fires as a result of this earthquake.

Shelter Requirement HAZUS estimates no displaced households due to the earthquake. No people are expected to seek temporary shelter.

Land Use and Development Trends

The land use and development trends information is excerpted from the *2007 Draft Existing Conditions and Trends Report of the* Champaign County Land Resource Management Plan.

Population & Growth The 2000 U.S. Census Bureau population estimate for Champaign County is 179,669. Since 1972, the area of the County located within the corporate limits of a municipality has increased by 136 percent. Figure 4-1 illustrates the growth of municipal areas in the County occurring between 1972 and 2007. Since 1980, decennial population growth rates in Champaign County have stabilized around 3%. The highest percentages of population growth from 1960 to 2000 occurred in the Village of Savoy and the Village of Mahomet. The highest percentages of population decline occurred in the Villages of Longview, Rantoul, and Foosland.

Countywide population projections indicate, on average, that the County population will total approximately 209,561 people by the year 2030. This represents a countywide population increase of 16.6 percent (29,892 people) for the period of 2000 to 2030.

Existing Land Use Map Figure 4-2 is a countywide existing land use map, based on the Champaign County Assessor database for the year 2007. The County Assessor database contains a land use code for each land parcel which is based on the predominant use of the parcel. For example, lands designated as 'Agriculture' may include farm residences; however, based on the County assessor database, the residential use of these land parcels is incidental (or accessory) to the primary agricultural use of the entire land parcel.

Adopted municipal comprehensive plans within the HMP planning area designate future land use areas extending beyond the urban fringe of a municipality to within the one and one-half mile Extraterritorial Jurisdiction to accommodate expected housing, commercial, industrial land requirements of an increasing population base. Public infrastructure (e.g., public sewer and public water) will be needed to serve these designated future urban growth areas.

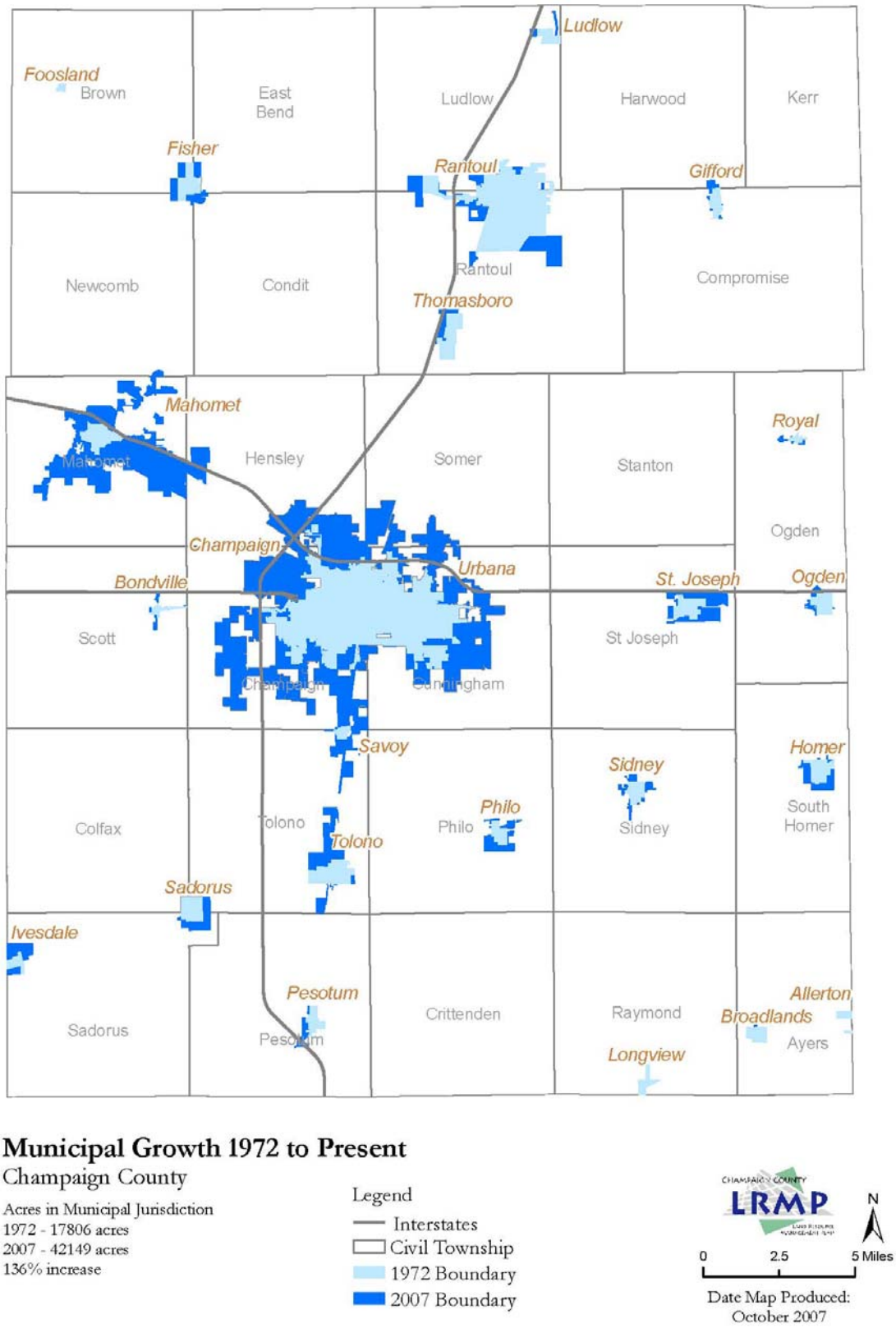
Increased Farmland Conversion Farmlands (cropland) constitute the largest share of land use by acreage in the HMP planning area. The largest percentage of farms continues to be farms that are 100 to 499 acres. The number of farms declined as the average farm size has increased. During 1988-2005 a total of 9,575 acres of farmland were converted, an average of 563 acres per year. The new uses included 4,310 acres of residential land, 283 acres for industrial purposes and 1,150 acres for commercial use. If current trends continue, land conversion is projected to increase in the next 25 years.

Limits on Residential Development in Rural Areas Residential development in unincorporated rural zoning districts is permitted on a limited basis. Since 1999, development of rural residential subdivisions has been regulated by the County's zoning requirement that a Rural Residential Overlay Zoning District be approved. This zoning map amendment process requires a public hearing and includes a detailed review of the residential development proposal as it relates to site suitability and agricultural compatibility.

Commercial and Industrial Development. The vast majority of commercial and industrial development within and near Champaign County occurs within urban areas. That general trend is not expected to change, given the County's policies to limit development within agricultural areas and to preserve agricultural areas. In the rural zoning districts, County zoning regulations allow only for establishment of certain types of low intensity commercial and industrial development that do not require public sanitary

sewer, do not create traffic conflicts, and that are compatible with agricultural operations and other neighboring land uses.

Figure 4-1: Municipal Growth 1972 – 2007



Municipal Growth 1972 to Present

Champaign County

Acres in Municipal Jurisdiction
1972 - 17806 acres
2007 - 42149 acres
136% increase

Legend
Interstates
Civil Township
1972 Boundary
2007 Boundary

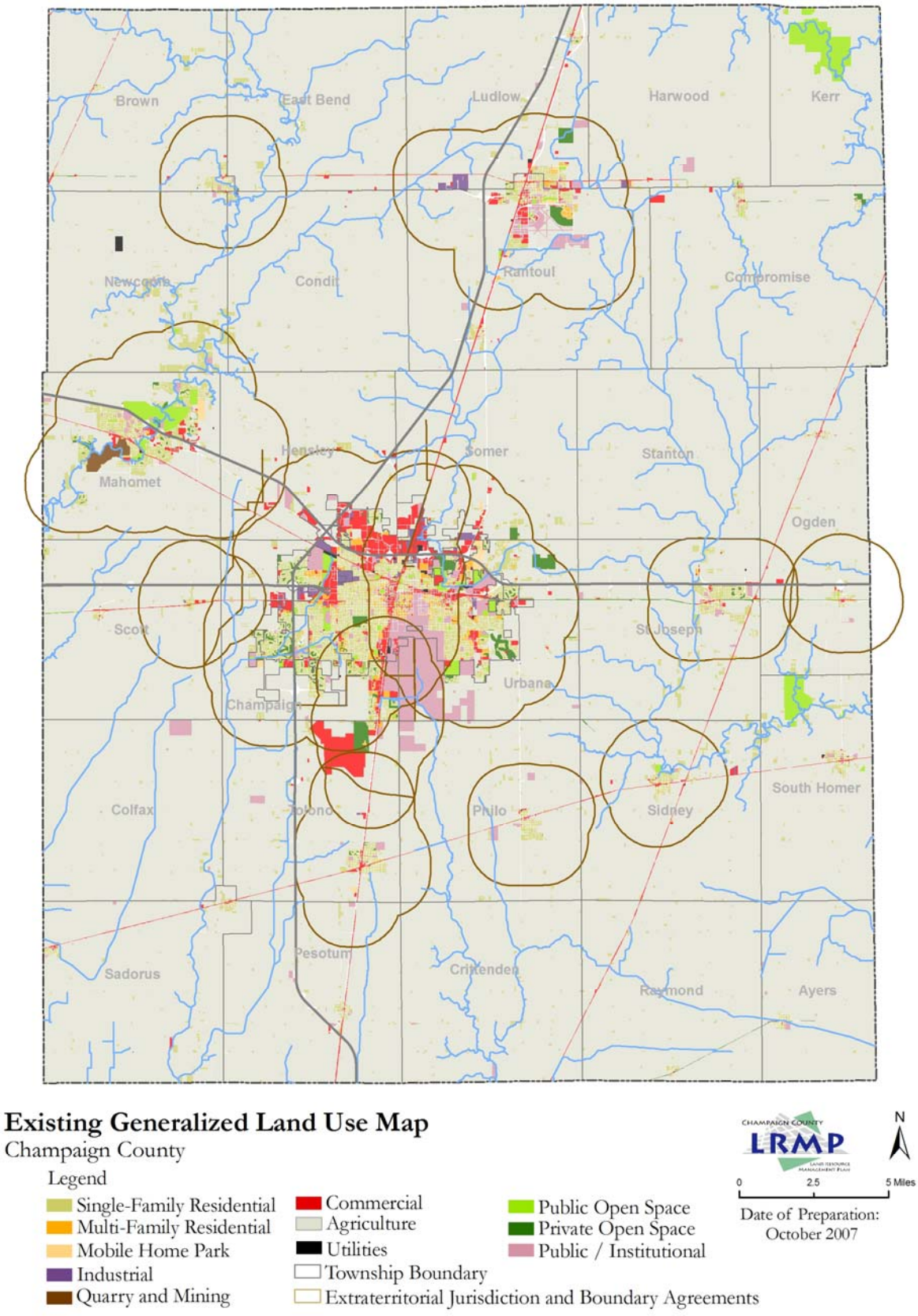
LRMP

N

0 2.5 5 Miles

Date Map Produced:
October 2007

Figure 4-2: Existing Land Use Map



Overview

This section contains:

- Table 4-21 with a ranking of the profiled natural hazards based on a qualitative assessment of jurisdictions' vulnerability;
- and Table 4-22 that provides a summary of vulnerability to natural hazards by jurisdiction.

Table 4-21: Ranking of Hazards Based on Vulnerability Assessment

Natural Hazard	Hazard Rank	Annual Probability	Property & Crop Damage	Safety Hazard	Critical Facility Vulnerability	Potential Economic Disruption	Jurisdictions Affected
Severe Storm	**1**	81% *47% Tornado* *62% Hail* *7% Damaging Lightning*	Moderate	High	High	Medium	All
Flood	**2**	67%	Major	Medium	Medium	Medium	***By Riverine Floods:*** ▪ Unincorporated Champaign County ▪ Bondville ▪ Champaign ▪ Fisher ▪ Ivesdale ▪ Mahomet ▪ Rantoul ▪ Royal, ▪ Sadorus ▪ Sidney ▪ St. Joseph ▪ Urbana ▪ Parkland College ▪ UIUC ***By Ponding and Flash Floods:*** All
Severe Winter Storm	**3**	87%	Minor	High	Medium	Medium	All
Extreme Heat	**4**	-	Minor	High	Low	Low	All
Drought	**5**	-	Moderate	Low	Low	Medium	All
Earthquake	**6**	-	Minor	Low	Low	Low	All

Rationale for Ranking of Natural Hazards

- **Severe storms**, which include tornados, hail, and lightning are the highest ranking natural hazard threat of this HMP. The large probability of severe storms, along with the potential threat to not only property, but the health and safety of the jurisdictions' citizens, make severe storms dangerous. The damage that occurs in a severe storm tends to be more localized than a flooding event, though tornados can damage property and cause injury across a large area.

- **Flooding** is the second ranking threat of this HMP. Although not all jurisdictions are threatened by riverine flooding, the frequency, high potential damage to property, and wide damage area of a flooding event make it a hazard which is likely to cause widespread, significant damage.

- **Severe winter storms** are the third ranking threat of this HMP. Severe winter storms can pose safety risks, particular associated with vehicular travel, because of the reduced visibility, and the slippery road conditions that they cause. Severe winter storms not only have the capability of making travel dangerous, but can disrupt transportation altogether if roads become impassable. Ice storms can cause property damage and interruption of power service.

- **Extreme heat** is the fourth ranking threat of this HMP. Extreme heat is not usually associated with property damage, but poses serious health risks, especially to vulnerable populations. An extreme heat event is likely affect the whole County, putting many people at a health risk.

- **Drought** is the fifth ranked hazard of this HMP. Droughts do threaten crops in the county. However, drought is ranked on the lower end of the hazards because it does not pose a significant threat to structures or critical facilities, nor does it pose a health and safety hazard.

- **Earthquakes** are ranked last in this HMP. The lack of historical damage caused by earthquakes in Champaign County, and the modest damage that is predicted by the HAZUS model suggests that earthquakes are least likely to impact the HMP planning area.

Summary of Vulnerability to Natural Hazards by Jurisdiction Table 4-22 on the following page provides a summary of vulnerability to natural hazards by jurisdiction.

The following key contains a description of categories used to rate overall vulnerability to natural hazards for each jurisdiction:

Key	na	Not a hazard to the jurisdiction
	L	Low Risk - little damage potential (e.g., minor damage to less than 5% of the jurisdiction)
	M	Medium Risk - moderate damage potential (e.g., causing partial damage to 5-10% of the jurisdiction; infrequent occurrence.
	H	Significant Risk - major damage potential (e.g., destructive, damage to more than 10% of the jurisdiction; regular occurrence.)

Table 4-22: Summary of Vulnerability to Natural Hazards by Jurisdiction

Profiled Natural Hazards: ► / Jurisdictions: ▼	Severe Storms includes Tornados, Hail, Damaging Lightning	Severe Winter Storms	Riverine Floods	Flash Floods or Ponding	Extreme Heat	Drought	Earthquake
Village of Allerton	H	H	na	L	M	L	L
Village of Bondville	H	H	M	L	M	L	L
Village of Broadlands	H	H	na	L	M	L	L
Unincorporated Champaign County	H	H	M	L	M	L	L
City of Champaign	H	H	M	L	M	L	L
Village of Fisher	H	H	M	L	M	L	L
Village of Foosland	H	H	na	L	M	L	L
Village of Gifford	H	H	na	L	M	L	L
Village of Homer	H	H	na	L	M	L	L
Village of Ivesdale	H	H	M	L	M	L	L
Village of Longview	H	H	na	L	M	L	L
Village of Ludlow	H	H	na	L	M	L	L
Village of Mahomet	H	H	M	L	M	L	L
Village of Ogden	H	H	na	L	M	L	L
Village of Pesotum	H	H	na	L	M	L	L
Village of Philo	H	H	na	L	M	L	L
Village of Rantoul	H	H	M	L	M	L	L
Village of Royal	H	H	M	L	M	L	L
Village of Sadorus	H	H	M	L	M	L	L
Village of Savoy	H	H	na	L	M	L	L
Village of Sidney	H	H	M	L	M	L	L
Village of St. Joseph	H	H	M	L	M	L	L
Village of Thomasboro	H	H	na	L	M	L	L
Village of Tolono	H	H	M	L	M	L	L
City of Urbana	H	H	M	L	M	L	L
University of Illinois at Urbana-Champaign	H	H	M	L	M	L	L
Parkland College	H	H	na	L	M	L	L

References

Climate Atlas of Illinois, Stanley A Changnon, et al., Illinois State Water Survey, March, 2004.

2007 Illinois Natural Hazards Mitigation Plan.
http://iema.illinois.gov/iema/planning/Documents/Plan_IllMitigationPlan.pdf

HAZUS-MH MR3 Earthquake and Flood Models Federal Emergency Management Agency. September 2008.

HAZUS-MH MR3 Earthquake Technical Manual. Federal Emergency Management Agency. 2003. http://www.fema.gov/library/viewRecord.do?id=3000.

HAZUS-MH MR3 Earthquake User Manual. Federal Emergency Management Agency. http://www.fema.gov/plan/prevent/hazus/hz_manuals.shtm.

HAZUS-MH MR3 Flood Technical Manual. Federal Emergency Management Agency. http://www.fema.gov/library/viewRecord.do?id=3033.

2007 Draft Existing Conditions and Trends Report of the Champaign County Land Resource Management Plan, Champaign County Regional Planning Commission.

our future.here. report entitled 'champaign county today and tomorrow: selected trends and conditions', Champaign County Regional Planning Commission, March, 2007.

Chapter 5 Capability Assessment

Chapter 5 contains the following HMP components:

- State and Local Capability Assessment

This Chapter contains a 'State Capability Assessment' and 'Local Capability Assessment'. Both are intended to provide an overview of existing mitigation authority, programs, plans, regulations, and efforts that relate to mitigation of natural hazards within the HMP planning area.

State Capability Assessment

The Illinois Natural Hazard Mitigation Plan (INHMP) dated October 2007, assesses the State's capability for mitigation of potential harm and damages from natural disasters. An overview of State of Illinois' capability to mitigate impacts of natural hazards is provided in the following INHMP excerpt:

> "The State of Illinois has the legal authority to engage in pre- and post-disaster mitigation activities. …[The Illinois Mitigation Advisory Group] ..develop[s] policy and promote[s] the mitigation policies, best methods and procedures to their respective and related organizations in the State. …
>
> The State has several funding programs in place which are available to local jurisdictions. These funds are primarily from various Federal grant programs. Currently, the State uses the FEMA programs of HMGP, FMA, PDM and the HUD program of Community Development Block Grants (CDBG) funds to promote mitigation activities. The State supplements these sources with funding from the Flood Hazard Mitigation Program from IDNR/OWR. This program is funded with Capital Bond Funds and the amount varies from year-to-year depending on the appropriation of the legislature. The Program occasionally receives special appropriations from the legislature (e.g., *Build Illinois, Illinois First.)* These funds must be used for the purchase of real property (not mobile homes) in the floodplain.
>
> In Illinois much of the legal enforcement powers are decentralized and lie within the local jurisdictions. Illinois is a 'homerule' State. This results in the lack of uniformity from one jurisdiction to the next. .. Examples are:
>
> 1) Each jurisdiction must enforce its own zoning rules and regulations which includes floodplain management. The State cannot enforce these regulations, it is up to the local jurisdiction.
>
> 2) Each jurisdiction chooses whether or not to adopt building codes and is responsible for enforcing building codes. The State of Illinois has not adopted a statewide building code.
>
> … The Illinois DNR/OWR has developed a model ordinance for floodplain management, that provides the minimum requirements an NFIP participating jurisdiction must enforce. This model encourages community development outside of the floodplain and assists in managing the current floodplain. It requires a State permit for any construction in the floodway. Some jurisdictions have chosen to exceed the requirements of the model ordinance and have adopted more restrictive ordinances."

Source: INHMP, 2007

Local Capability Assessment
The local capability assessment contains an overview of existing authorities, policies, ongoing programs and available resources related to the ability of the HMP jurisdictions to mitigate potential losses from natural hazards.

Mitigation Measures in Place
Known existing mitigation measures to avoid the hazardous impacts of severe storms and severe winter storms across the HMP planning area jurisdictions are described in this section.

Weather Warning Systems
A system of outdoor tornado warning sirens serves the highly populated urbanized areas of the HMP planning jurisdiction, including: City of Champaign, City of Urbana, Villages of Rantoul, Mahomet, St. Joseph, and Savoy, the University of Illinois at Urbana-Champaign and Parkland College campuses. Outlying villages with an outdoor tornado warning siren are: Tolono, Philo, Ogden, Ludlow, Sidney, Broadview, Longview, Allerton, Homer, Pesotum, Ivesdale, Fisher, and Foosland. Unincorporated areas of the County, and the outlying communities of Bondville, Seymour, Gifford, Penfield and Royal are not served by an outdoor tornado warning siren.

Emergency Warning Radios
In the HMP planning area, most large employers, retailers, schools and places of public assembly, and facilities that house vulnerable populations (e.g., hospitals, nursing homes, jails) area have acquired one or more NOAA emergency warning radios to provide warning of severe storms, tornados, dangerous winter storm conditions and other hazards.

Severe Weather Spotters
The Champaign County Emergency Management Agency supports the volunteer efforts of the National Weather Service (NWS) Severe Weather Spotters (aka 'Storm Spotters') throughout the County. NWS utilizes the information provided by Spotters to support its severe weather warning operations, e.g., to verify radar-indicated or public reports of severe weather.

Stormready Designation
Champaign County is a designated Stormready Community and meets the Stormready requirements established by the NWS. Specifically, the County:

- has established a 24-hour emergency operations center;
- has more than one way to receive severe weather warnings and forecasts and to alert the public;
- has created a system that monitors weather conditions locally;
- meets criteria established by NWS regarding promoting the importance of public readiness;
- has developed a formal hazardous weather plan, including training of severe weather spotters and emergency exercises.

Building Code Standards
Certain larger HMP jurisdictions have adopted versions of the *International Residential Code* (for one- and two-family dwellings) and the *International Building Code* (for all other buildings). The *2006 International Code Series* building codes feature fire- and life-safety provisions that address wind and roof construction standards (for snow load). Safe rooms (e.g., tornado shelters) are not addressed in the 2006 International Code series. The *2009 International Building Code* addresses storm shelters and references the new International Code Council's *ICC 500 Standard for Storm Shelters*.

Jurisdictions within the HMP planning area with no adopted building code are subject to requirements of the *Illinois Residential Building Code Act* (815 ILCS 670/1 *et seq*.). This Act requires the identification of a building code as new homes are constructed. Notably, the Act does not obligate the County to enforce the requirements contained within the Act.

Table 5-1 contains information regarding building code adoption by HMP planning area jurisdictions.

Table 5- 1: Building Code Adoption by HMP Planning Area Jurisdictions

Jurisdiction	Building Code Adopted?	Building Code Adopted
Village of Allerton	No	
Village of Bondville	No	
Village of Broadlands	No	
Unincorporated Champaign County	No	
City of Champaign	Yes	2006 International Residential Code and 2006 International Building Code
Village of Fisher	No	
Village of Foosland	No	
Village of Gifford	No	
Village of Homer	No	
Village of Ivesdale	No	
Village of Longview	No	
Village of Ludlow	No	
Village of Mahomet	No	
Village of Ogden	No	
Village of Pesotum	Yes	National Building Code of the Building Officials and Code Administrator (BOCA)
Village of Philo	Yes	
Village of Rantoul	Yes	2006 International Residential Code and 2006 International Building Code
Village of Royal	No	
Village of Sadorus	No	
Village of Savoy	Yes	2003 International Residential Code and 2003 International Building Code
Village of Sidney	Yes	2006 International Residential Code and 2006 International Building Code
Village of St. Joseph	No	
Village of Thomasboro	No	
Village of Tolono	No	
City of Urbana	Yes	2003 International Residential Code and 2003 International Building Code
University of Illinois at U-C*	No	Subject to 2006 International Residential Code and 2006 International Building Code
Parkland College*	No	Subject to 2006 International Residential Code and 2006 International Building Code

Source: Staff Survey of Jurisdictions

Table 5-1 Note* The Illinois Capital Development Board (CDB) is the construction management agency for state construction projects including university and college buildings. CDB has adopted the International Building Codes for use. Building construction at UIUC and Parkland is generally exempt from County or municipal construction permitting requirements.

Manufactured Home Safety

Federal and state programs are in place to regulate construction of and installation (tie-down) of manufactured homes in the State of Illinois.

A manufactured home is subject to separate construction standards established by the U.S. Department of Housing and Urban Development (HUD). Manufactured homes constructed after June 15, 1976 are required to comply with the *National Manufactured Home Construction and Safety Standards,* as established by HUD. Local governmental jurisdictions may regulate the location of manufactured homes or require added on-site inspection procedures; however, the HUD construction standards may not be altered.

At the state level, the Illinois Department of Public Health enforces *The Illinois Mobile Home Act and Manufactured Home Tiedown Code.* These regulations include equipment and installation standards that must be met, including the requirement that installation be completed in accordance with manufacturer specifications. Certification that installation complies with the state Tie-Down Code is required to be filed with the state following installation. At present, the State only conducts post-installation manufactured home inspections following receipt of a complaint. Additional certification requirements apply to manufactured school classroom units.

Important to note is that the federal or state requirements applicable to manufactured homes do not include a requirement for a safe room or a shelter to be provided.

Public Utilities Protection

Ameren IP, a primary supplier of electricity to customers in the HMP planning area, operates a tree-trimming and tree-removal program in urban areas in an effort to ensure that above-ground electric wires are clear of tree limbs and falling tree dangers.

The larger HMP planning area jurisdictions have adopted subdivision code regulations requiring new developments to bury electrical service and other utilities underground in order to lessen vulnerability of utilities(e.g., during a tornado or during an ice storm).

Local Media Outreach

Local television and radio stations provide emergency warning and public service announcements in advance of severe storms and severe winter storm events.

Road Treatment in Advance of Expected Ice Condition

IDOT and the larger jurisdictions maintain fleets of trucks and drivers to spread bulk rock salt (or other anti-icing agents) on major roads in advance of (and during) severe storms expected to produce icing on roads. Generally, arterial roads are completed first, followed by collector roads, sub-collector roads and school zone areas that may not be situated along these more heavily traveled roadways. Additional areas receiving rock salt applications prior to and during winter storm events include roadway curves, hills and local street intersections.

Overview of Local Plans and Selected Regulations

Preventive measures in place by HMP jurisdictions include:

- adoption of a comprehensive land use plan;
- enforcement of floodplain regulations that limit or exclude development in the100-year floodplain; and
- zoning and subdivision code requirements regarding development in or near the 100-year floodplain.

Table 5-2 indicates which HMP planning area jurisdictions have adopted a comprehensive land use plan, floodplain regulations, subdivision regulations, or zoning regulations.

Table 5-2: Selected Plans and Regulations

Jurisdiction	Comprehensive Land Use Plan	Floodplain Regulations	Stormwater Management Regulations	Zoning Code
Village of Allerton	No	No	No	No
Village of Bondville	Yes	No	Yes, Subdivision Regulations	Yes
Village of Broadlands	No	Yes	No	Yes
Unincorporated Champaign County	Yes[1]	Yes, Special Flood Hazard Areas Ordinance	Yes, Stormwater Management Policy	Yes
City of Champaign	Yes	Yes, Municipal Code Ch. 9	Yes, Subdivision Regulations	Yes
Village of Fisher	Yes	Yes	Yes, Municipal Code	Yes
Village of Foosland	No	No	No	No
Village of Gifford	No	No	Yes, Subdivision Regulations	Yes
Village of Homer	No	No	Yes, Subdivision Regulations	Yes
Village of Ivesdale	No	No	No	Yes
Village of Longview	No	No	No	No
Village of Ludlow	No	No	No	Yes
Village of Mahomet	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Ogden	Yes	No	No	No
Village of Pesotum	No	No	Yes, Subdivision Regulations	Yes
Village of Philo	Yes	No	Yes, Subdivision Regulations	Yes
Village of Rantoul	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Royal	No	No	Yes, Subdivision Regulations	Yes
Village of Sadorus	No	No	Yes, Municipal Code	Yes
Village of Savoy	Yes	No	Yes, Stormwater Control Ordinance	Yes
Village of Sidney	Yes	Yes	Yes, Municipal Code	Yes
Village of St. Joseph	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Thomasboro	No	No	Yes, Subdivision Regulations	Yes
Village of Tolono	Yes	No	Yes, Subdivision Regulations	Yes
City of Urbana	Yes	City of Urbana HMP, 2005	Yes, Chapter 21, Municipal Code	Yes
University of Illinois at U-C*	No[2]	No[3]	No[3]	No[3]
Parkland College*	No[2]	No[3]	No[3]	No[3]

Source: Staff Survey of Jurisdictions

Table 5-2 Notes:

1. Champaign County adopted Land Use Goals and Policies in 1977, as its official plan. The Champaign County Land Resource Management Plan (LRMP) is presently under development and review by the County. The LRMP is intended to consolidate and update the County's 1977 Land Use Goals and Policies and the County's 2001 and 2005 Land Use Regulatory Policies.

2. UIUC and Parkland College do not have the legislative authority to produce a comprehensive land use plan. Both, instead, have adopted a campus master plan.

3. The Illinois Capital Development Board (CDB) is the construction management agency for state construction projects including university and college buildings. CDB has adopted the International Building Codes for use. Building construction at UIUC and Parkland is generally exempt from County or municipal construction permitting requirements.

Comprehensive Land Use Plans

Twelve municipalities, as noted in Table 5-3 above, have adopted a comprehensive land use plan. The more recently updated comprehensive land use plans tend to designate stream corridors for open space or recreational use.

Zoning and Subdivision Regulations

The adopted zoning regulations of municipal and county jurisdictions within the HMP planning area typically include minimum setback requirements along streams or rivers.

The adopted subdivision regulations of the municipal and county jurisdictions within the HMP planning area typically address minimum building site and drainageway standards (e.g., that each lot have a building site of sufficient size above the 100-year floodplain; or that roads leading to a development site meet minimum access standards).

Flood Insurance Studies

The Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 led to a number of Flood Insurance Studies completed by FEMA in the 1980's and later updated. The Flood Insurance Studies (FIS) investigated the existence and severity of flood hazards in certain of the HMP planning area jurisdictions, and were used to create the Flood Insurance Rate Maps (FIRM) used in FEMA's National Flood Insurance Program. The following FIS's were completed by FEMA:

- County of Champaign, Illinois (Unincorporated Areas), September 1, 1983
- County of Champaign, Illinois (Unincorporated Areas), revised January 2, 2003
- City of Urbana, Illinois, July 16, 1980
- City of Champaign, Illinois, January 16, 1981
- Village of Mahomet, Illinois, January 2, 2003
- Village of St. Joseph, May 16, 1983
- Village of Fisher, Illinois, February 1, 1984

FIS areas were selected based on the extent and validity of existing relevant data.

The flood sources studied in the County FIS revised in 2003 included portions of Copper Slough, McCullough Creek, Saline Branch, Salt Fork, Sangamon River, Phinney Branch, and Upper Boneyard Creek. "Principal Flood Problems" identified in the Champaign County FIS revised in 2003 are indicated as follows:

- "McCullough Creek, Copper Slough, Upper Boneyard Creek, and Phinney Branch experience overbank flooding due to the short, intense thunderstorms common in central Illinois. No flood event has been measured or high watermarks recorded for these streams."

- "The Saline Branch experienced a flood of record in 1964 of approximately a 100-year frequency….. Flooding of the Saline Branch usually occurs during spring thaws, when runoff is accelerated by intense rainfalls."

- "The Sangamon River experienced a flood in April 1994, of approximately a 100-year frequency. However, because there is no longer a recording gauge in Mahomet, there is no accurate estimate of the frequency or magnitude of this event. This storm was used to calibrate the "Sangamon River Floodplain Study."

- "There is no data or information available pertaining to past flooding on Salt Fork River."

Boneyard Creek Improvement Plans

The upstream watershed boundary of the Boneyard Creek lies in the northwest portion of the City of Champaign. The Boneyard Creek flows through densely urban portions in the City of Champaign, across the north portion of the University of Illinois campus and the City of Urbana. For years, the Boneyard Creek has functioned as an open stormwater drainage creek. An excerpt from the *City of Urbana 2005 HMP* describes flood problems associated with the Boneyard:

> "Ninety percent of the time it contains less than one foot of water. In periods of heavy rainfall, … it floods low-lying sections. The Boneyard receives the discharge from all storm sewers in the Urbana area and is inadequate for this purpose. Because high waters in the Boneyard greatly reduce the carrying capacity of the trunk and lateral sewers connected to it, flooding is not limited to over-bank floods. There is a general surcharge of much of the drainage system throughout the flatter parts of the two cities. Since the early 1900's, various efforts have been undertaken to improve the Boneyard … but these were usually localized remedial measures…"

Since mid-1990's, the Cities of Champaign and Urbana and the University of Illinois have invested in planning and constructing comprehensive structural improvements to the Boneyard with the overall goal of confining the 100-year floodplain to within the banks of the Boneyard Creek.

By 1999, the City of Champaign installed a massive 38 million gallon detention basin to receive stormwater flow at peak rainfall times. This initial improvement was a major step toward significantly reducing the risk of flooding to the general area and areas downstream in the City of Urbana. The process of flood mitigation of the Boneyard Creek is ongoing and expected to continue for several years. Some of the approved structural improvements planned are:

> The *Boneyard Creek Improvement Plan* is a seven-phase plan to provide 100-year flood protection along the Boneyard Creek. This project will mostly benefit and impact residential and business property situated in the Campustown area of the UIUC, and nearby areas in the City of Champaign and City of Urbana. Completed and in progress portions of this Plan include:

- *Boneyard Creek Improvement Plan, Phase 1 (City of Champaign)*
  The completed Phase 1 included construction of the Healey Street detention basin and improvements along Boneyard Creek between Lincoln Avenue and First Street, and has provided relief from serious flood problems throughout the Campustown area.

- *Boneyard Creek Improvement Plan, Phase 2 (City of Champaign)*
  Phase 2 is presently underway and includes construction of the Second Street detention improvements. Phase 2 will increase the level of flood protection through campus to 100-year protection. Phase 2 improvements will occur between University Avenue and Washington Street in the City of Champaign, and is expected to improve viaduct capacity at Springfield Avenue, Logan Street, Chester Street, and University Avenue.

City of Urbana Boneyard Creek Master Plan, 2008
The Master Plan focuses on the portion of the Boneyard Creek that runs through Downtown Urbana, specifically between Main Street and University Avenue. The plan includes enhancing the physical appearance of the creek through improvements such as naturalization, landscaping, bank stabilization, and other amenities, while maintaining the creek's primary drainage function.

City of Urbana Boneyard Creek Master Plan, 1978
Portions of the 1978 Master Plan remain in effect for the western area of the Boneyard Creek that extends beyond Main Street and University Avenue within the City of Urbana limits.

Watershed Plans

The *John Street Watershed Plan* is being developed to address surface flooding in an urban area within the City of Champaign. The John Street urban watershed extends from Neil Street on the east, Garfield Avenue on the west, Springfield Avenue on the north and Hessel Boulevard on the south. This is a dense residential area that has endured severe surface flooding. The area where surface flooding is most severe includes the 500 and 600 blocks of John Street and the intersection of Daniel Street at Willis Avenue.

Two other watershed management plans have been prepared for rivers situated within the HMP planning area: the *Embarras River Watershed Management Plan* and the *Salt Fork Watershed Plan*.

Boneyard Floodplain Remapping Project
Urbana, Champaign, and the University of Illinois retained the U.S. Geological Survey (USGS) to remap the 100-year floodplain for the Boneyard Creek. The USGS study will be submitted to FEMA to update their flood maps.

The HAZUS 100-year flood data utilized in the HMP Vulnerability Assessment for this HMP is known to be out-of-date in the Boneyard Creek floodplain area, where recent structural improvements have occurred.

Floodplain Map Modernization Project

> "Accurate delineation of flood hazard areas is fundamental to floodplain management and mitigation, yet many of Illinois' regulatory Flood Insurance Rate Maps (FIRMs) are 10 or more years out of date."
>
> *Excerpt from Floodplain Map Modernization Project Abstract, 2004 Sally McConkey, Principal Investigator*

Since 2004, the IDNR Office of Water Resources (OWR) has been supported by a partnership with FEMA to modernize floodplain mapping for the State of Illinois. This project will produce the best available base maps in a geographic information system (GIS) geodatabase and will result in digital map products that allow for improved updating and maintenance. Updated FIRMs for the HMP planning area are expected to become available by 2010.

Local Media Outreach

Local television and radio stations provide emergency warning and public service announcements to warn motorists of flash flood potential and warn of flooded roadways.

References

2007 Illinois Natural Hazards Mitigation Plan
http://iema.illinois.gov/iema/planning/Documents/Plan_IllMitigationPlan.pdf

Hazards Mitigation Plan, City of Urbana, approved by FEMA May, 2005
http://www.ci.urbana.il.us/Urbana/community_development/planing/comprehensive_plan/hazard_m

Chapter 6 Mitigation Strategy

Chapter 6 contains the following HMP components:

- Local Hazard Mitigation Goals *§201.6(c)(3)(i)*
- Identification and Analysis of Mitigation Actions *§201.6(c)(3)(ii)*
- Identification and Analysis of Mitigation Actions: NFIP Compliance *§201.6(c)(3)(ii)*
- Implementation of Mitigation Actions: *§201.6(c)(3)(iii)* and Multi-Jurisdictional Mitigation Actions: *§201.6(c)(3)(iv)*

Local Hazard Mitigation Goals

> ***Goals*** are general guidelines that explain what you want to achieve. They are broad policy statements and are usually long-term and represent global visions.
>
> ***Objectives*** define strategies or implementation steps to attain the identified goals.

Source: Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning Guide Number Eight, FEMA-386-8

Prior to identifying HMP goals and objectives, Planning Team members reviewed the preceding risk assessment and hazard vulnerability findings for each of the profiled natural hazards. Members reviewed existing local natural hazard mitigation plan goal and objective statements from selected local hazard mitigation plans, including:

- State of Illinois Natural Hazard Mitigation Plan, revised October, 2007
- City of Urbana Hazard Mitigation Plan adopted June 20, 2005
- Champaign County Hazard Mitigation Plan dated July 1997

Planning Team members identified the following broad goal statement as a guideline regarding the HMP long-term intent: “Protect life and properties within the HMP planning area from these natural hazards: severe storms; severe winter storms; floods; extreme heat; drought; and earthquake.” Ultimately, members reached consensus on four goals that broadly describe the long-term ideals and intentions of the HMP. These four goals are:

1. Minimize avoidable deaths and injuries due to natural hazards.
2. Protect existing and new infrastructure from impacts of natural hazards.
3. Include natural hazard mitigation in local government plans and regulations.
4. Coordinate natural hazard mitigation efforts of participating jurisdictions.

Members identified objectives, as possible, to provide specific implementation steps for achieving each goal. These objectives are consistent with those of the current *State of Illinois Natural Hazard Mitigation Plan* and the adopted *City of Urbana Hazard Mitigation Plan.*

The HMP goals and accompanying objectives appear on the following page.

HMP Goals and Objectives

Goal 1. Minimize avoidable injuries and deaths due to natural hazards.

Objectives
- 1-a Educate the population regarding methods of protecting self and property from natural hazard impacts.
- 1-b Establish adequate warning systems.
- 1-c Protect critical facilities and services from impacts of natural hazards.
- 1-d Arrange for provision of storm shelters and cooling centers for the population.

Goal 2. Protect existing and new infrastructure from impacts of natural hazards.

Objectives
- 2-a Monitor infrastructure conditions for needed maintenance.
- 2-b Ensure that water is available in the event of a drought.

Goal 3. Include natural hazard mitigation in local government plans and regulations.

Objectives
- 3-a Improve the information base regarding vulnerability to impacts of natural hazards.
- 3-b Review local programs and ordinances to determine how they can better address the impacts of natural hazards.

Goal 4. Coordinate natural hazard mitigation efforts of participating jurisdictions.

Objective
- 4-a Update the multiple jurisdiction HMP every five years.

Identification and Analysis of Mitigation Actions

Comprehensive Range of Specific Mitigation Actions For Each Hazard Planning Team members and HMP project staff reviewed a comprehensive range of specific mitigation actions for each hazard and jurisdiction by reviewing groups of mitigation actions as identified by FEMA:

- preventive
- property protection
- natural resource protection
- structural projects
- public education and awareness

continued on next page

Preventive Measures 'Preventive' mitigation actions are defined by FEMA as government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions include public activities to reduce hazard losses.

Multi-Hazard

1. Adopt the latest International Building Codes.
2. Conduct tree trimming program for street trees so that they do not become safety hazards.

Severe Storms

1. Adopt higher wind resistant building codes.
2. Provide subsidies for wind resistant construction.
3. Provide subsidies for construction of "safe rooms" in existing buildings.
4. Require that all newly constructed buildings have at least one "safe room."
5. Modify building code to require stronger tie-down and anchoring methods for mobile homes.
6. Require underground utilities for new construction.

Floods

1. Adopt development regulations which limit building in the 100-year flood plain and in areas prone to ponding.
2. Acquire undeveloped land within the flood plain.
3. Acquire development rights within the flood plain.
4. Obtain updated floodplain map.
5. Develop drainage system maintenance standards.
6. Participate in Community Rating System (CRS) for reduced flood insurance premiums through NFIP.

Severe Winter Storms

1. Require underground utilities for new construction.
2. Use tree or vegetation plantings along roadways as a natural barrier to snow drifts.
3. Apply anti-icing or de-icing substance to road surfaces prior to imminent ice storm.

Drought

1. Prepare and implement drought contingency plans to consider actions and needs during drought events, including a plan to ensure that rural residents who rely on shallow wells will have enough water during periods of drought.
2. Map areas with limited water supply and discourage development there.

Extreme Heat

1. Distribute fans.
2. Create a program to repair fans and air conditioners.
3. Encourage voluntary neighbor check programs.

Earthquakes

1. Adopt up-to-date seismic resistant building codes.
2. Incorporate structural and non-structural seismic strengthening actions into on-going capital improvement planning efforts.

Property Protection FEMA defines 'property protection' mitigation actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from the hazard area. Examples of property protection mitigation actions considered by HMP participating jurisdictions include:

Property Protection *(continued)*

Multi-Hazard
1. Structural retrofits
2. Storm shutters
3. Shatter-resistant glass

Floods
1. Acquisition
2. Elevation
3. Relocation

Natural Resource Protection 'Natural resource protection' mitigation actions, as defined by FEMA , are those that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. The following mitigation actions were considered by HMP participating jurisdictions as ongoing or potential natural resource protection mitigation actions:

Floods
1. Sediment and erosion control
2. Stream corridor restoration
3. Watershed management
4. Forest and vegetation management
5. Wetland restoration and preservation

Emergency Services 'Emergency services' mitigation actions, as defined by FEMA, are actions that protect people and property during and immediately after a disaster or hazard event. HMP participating jurisdictions considered the following ongoing or potential emergency service mitigation actions:

Multi-Hazard
1. Install outdoor warning sirens
2. Use NOAA all hazard radios
3. Voluntary text messaging alert systems

Structural Control Projects FEMA defines a mitigation action category of 'structural control projects' as actions that involve the construction of structures to reduce the impact of a hazard. HMP participating jurisdictions considered the following as ongoing or potential structural control projects:

Multi-Hazard
1. Install emergency back-up generators in critical facilities

Floods
1. Storm sewer system improvements
2. Improvements to bridges, culverts and roads in floodprone areas

Public Education and Awareness

FEMA defines a category of mitigation actions as 'public education and awareness'. 'Public education and awareness' mitigation actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

Multi-Hazard
1. Outreach programs
2. Hazard information centers
3. School-age and adult education programs

Floods
1. Disclose real estate flood hazard information

For review purposes, a spreadsheet was developed for each participating jurisdiction to list all known ongoing natural hazard mitigation actions and proposed natural hazard mitigation actions, categorized into the six FEMA categories, noted in the above section. Planning team members and project staff indicated whether each mitigation action listed addressed the effects of natural hazards on: *'**new**'* buildings and infrastructure, '***existing***' buildings and infrastructure, or '***both'***.

Mitigation Actions that Impact New Buildings and Infrastructure Specific mitigation actions were reviewed for each participating jurisdiction that address the impacts of hazards on *new buildings and infrastructure*. A review of the ongoing and proposed mitigation actions for each participating jurisdiction was undertaken to consider whether the following types of mitigation actions could be included or proposed:

- Develop and adopt a comprehensive land use plan
- Support or participate in development and implementation of watershed management plan(s)
- Enact subdivision requirement that utilities serving new developments must be underground
- Adopt International Residential Code and International Building Code with most current standards for:
    - wind- and seismic- resistance
    - maximum snow load
    - safe rooms / shelters
- Prohibit or limit development in 100-Year Floodplain
- On jurisdiction website, provide online links to and/or otherwise disseminate available information regarding: natural hazard preparedness and mitigation measures, including effective construction standards
- Encourage individual and business use of NOAA All Hazard Radios

Mitigation Actions that Impact Existing Buildings and Infrastructure Specific mitigation actions that address the impacts of hazards on existing buildings and infrastructure were reviewed for each participating jurisdiction. If applicable and considered as feasible for each participating jurisdiction, the following or other similar mitigation actions were included on each participating jurisdiction's list of ongoing and proposed mitigation actions:

- Participate in National Flood Insurance Program
- Participate in the Community Rating System Program
- Continue regular maintenance of street trees
- Become a Tree City or a Tree Campus
- Become a NWS "Stormready Community"
- Develop a partnership with nonprofit or private agencies to establish or provide shelter or safe room use
- Develop a plan for improvements to protect infrastructure situated within a 100-Year Floodplain (bridges, culverts or roads)
- On jurisdiction websites, provide online links to disseminate available information regarding: natural hazard preparedness and mitigation measures, including effective construction standards
- Encourage individual and business use of NOAA All Hazard Radios

Mitigation Action Preference Survey The Mitigation Measures Preference Survey was designed to gather and consider public input about potential hazard mitigation actions. The *Champaign County HMP Mitigation Measures Survey* was placed online at the HMP website (www.ccrpc.org/HMP) and paper copies of the survey were provided to the primary contact of

each participating jurisdiction. The primary contact for each participating jurisdiction was encouraged to place a link to the survey on their own jurisdiction website and to otherwise publicize the opportunity to complete the survey. The Survey was available online over an eight-week period, November 24, 2008 through January 16, 2009.

The survey contained 40 questions. Participants were asked to indicate whether they "strongly agree," "agree," "disagree," or "strongly disagree" with a series of natural hazard mitigation actions.

Fifty-seven responses to the survey were received. Respondents most preferred implementing public awareness and public education mitigation actions; actions to protect critical facilities; and adopting building codes to require safe rooms and other standards to strengthen structures to be wind resistant.

Identification and Analysis of Mitigation Actions Related to NFIP Compliance

NFIP provides flood insurance to homeowners, renters and businesses in communities which participate in the NFIP. Home and business owners may buy coverage for their buildings and contents, and renters can purchase insurance to cover personal property. NFIP flood insurance is intended for residents and business owners, whether or not they live in a floodplain, as long as their community participates in the program—since approximately 25% of flooding insurance claims occur in areas not readily recognized as being vulnerable to flooding because they are outside mapped flood zones. Based on NFIP data, the average annual flood insurance premium in Illinois is $450. Some private insurance companies and agents sell and service the policies which are backed by the federal government under FEMA's NFIP.

Participation in NFIP is based on an agreement between a community and FEMA. The NFIP promotes three flood-related programs:

- ***floodplain identification and mapping*** NFIP participation requires community adoption of flood maps. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed to administer floodplain management programs and to actuarially rate new construction for flood insurance.
- ***floodplain management*** To participate in the NFIP, a community is required to adopt and enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures.
- ***flood insurance*** Community participation in the NFIP enables property owners to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

Source: FEMA Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, p. 61

At present, a total of twelve HMP jurisdictions participate in the National Flood Insurance Program (NFIP). Each of the twelve communities that participate in NFIP agreed to adopt and enforce sound floodplain management practices to reduce future flood damage.

Table 6-1 describes each jurisdiction's participation in the NFIP.

Table 6-1: Participation in NFIP and Location within Floodplain

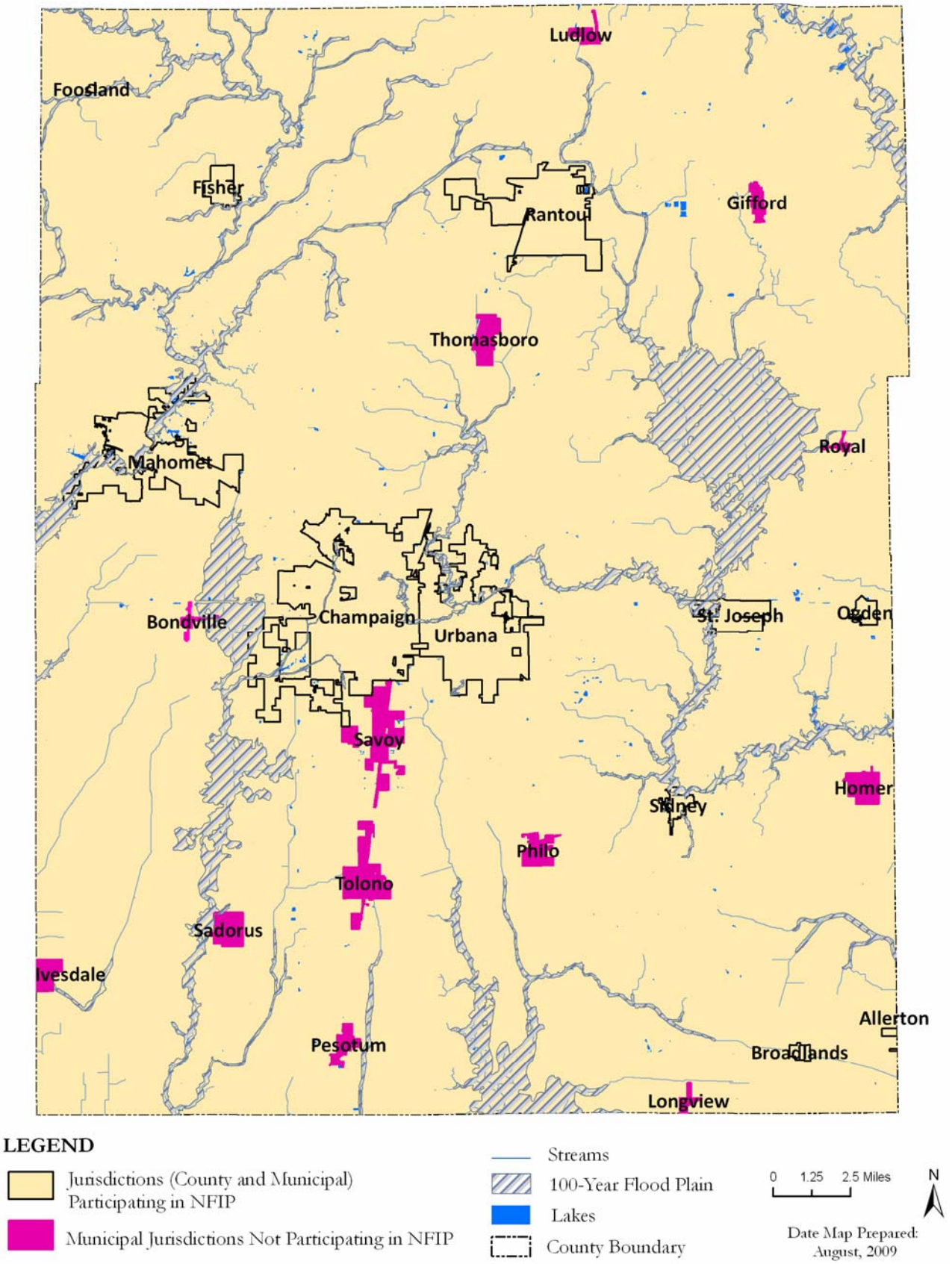
Jurisdiction	*Does the Jurisdiction participate in NFIP?*	*Is the jurisdiction located Within 100-Year floodplain?*
Unincorporated Champaign County	Yes	partially
Village of Allerton	Yes	No
Village of Broadlands	Yes	No
City of Champaign	Yes	partially
Village of Fisher	Yes	partially
Village of Foosland	Yes	No
Village of Mahomet	Yes	partially
Village of Ogden	Yes	No
Village of Rantoul	Yes	partially
Village of Sidney	Yes	partially
Village of St. Joseph	Yes	partially
City of Urbana	Yes	partially
Village of Bondville	No	partially
Village of Gifford	No	No
Village of Homer	No	No
Village of Ivesdale	No	partially
Village of Longview	No	No
Village of Ludlow	No	No
Village of Pesotum	No	No
Village of Philo	No	No
Village of Royal	No	partially
Village of Sadorus	No	partially
Village of Savoy	No	No
Village of Thomasboro	No	No
Village of Tolono	No	partially
University of Illinois at U-C	n/a	partially
Parkland College	n/a	partially

Figure 6-1 displays the 100-Year Floodplain as mapped by FEMA based on the September 1, 1983 Flood Insurance Study prepared by FEMA for Champaign County. Overlaid is keyed information regarding municipal jurisdictions that presently participate in NFIP. The municipal jurisdictions portrayed in red do not participate. Municipal participations shown in yellow do participate in NFIP.

Jurisdictions Not Participating in NFIP To date, the Villages of Bondville, Gifford, Homer, Ivesdale, Longview, Ludlow, Pesotum, Philo, Royal, Sadorus, Savoy, Thomasboro and Tolono have chosen not to participate in the NFIP. The Villages of Bondville, Ivesdale, Royal, Sadorus, and Tolono are considered as being partially situated within the 100-year floodplain, as inferred from currently available FEMA Flood Insurance Rate Maps (FIRMs). FIRMs have not been mapped to include information about the locations of the 100-year floodplain in the Villages of Gifford, Homer, Longview, Ludlow, Pesotum, Philo, Savoy, and Thomasboro. The locations of municipalities not participating in NFIP are noted in Figure 6-1.

Jurisdictions Participating in NFIP
The identification and analysis of mitigation actions related to continued compliance with the NFIP occurred for each NFIP participating jurisdiction. One or more actions related to NFIP compliance are included in the mitigation action plan for each of these jurisdictions.

Figure 6-1: NFIP Participation



Implementation of Mitigation Actions

Mitigation Action Prioritization Method Planning Team members agreed to use a prioritizing method that involves a 3-step analysis of each mitigation action. The analysis is completed by Planning Team members and project staff to prioritize all mitigation actions identified for each participating jurisdiction.

The prioritization method involved allocating points to each mitigation action. Each mitigation action was scored using the 3-step method, with each step yielding up to 14 points each. The maximum total score for any one mitigation action could be 42.

Step 1 The first analysis is one that assesses an 'action scope' for the mitigation action. Up to 14 points were allocated based on which category fits the subject mitigation action. Members determined which level each mitigation action fit into to: Level 1, Level 2, or Level 3. Next, if the mitigation action was determined to be a Level 1 or a Level 2 action, points were assigned based on Planning Team members' expertise and judgment as to the effectiveness of the mitigation action. Because Level 3 actions permanently eliminate or reduce property damages, injuries, or deaths in a specific area, Level 3 actions were assigned the highest amount of 14 points automatically.

A description of the 'action scope' levels and the points to be assigned to each 'action scope' level follows:

Level 1 Actions ***Potential Score: 1 to 14 points***

- Eliminate or reduce property damages, injuries and deaths from less significant natural hazards; or
- Educate the public on disaster preparedness and mitigation related to the less significant natural hazards (e.g., drought, or earthquake)

Level 2 Actions ***Potential Score: 8 to 14 points***

- Reduce property damages in a specific area; or
- Have the potential to reduce property damages, injuries and deaths across a wide area; or
- Educate the public disaster on preparedness and mitigation

Level 3 Actions ***Score: 14 points***

- Permanently eliminate property damages and/or eliminate or reduce injuries and deaths in a specific area; or
- Have a high probability to systematically reduce property damages, injuries and deaths across a wide area.

Step 2 **Cost Effectiveness Rating** ***Potential Score: 1 to 14 points***
Members ranked each mitigation action qualitatively and subjectively, based on perceived cost-effectiveness of the mitigation action. In rating 'cost-effectiveness', a score of 14 points was possible, with lower scores denoting less cost-effectiveness and higher scores denoting greater cost-effectiveness.

Step 3 **Feasibility Rating** ***Potential Score: 1 to 14 points***
Each action was assessed along 14 dimensions using a shortened version of FEMA's STAPLEE framework, referred to here as the 'STAPL Feasibility Chart'. If

the action was generally positive in a certain dimension, it was given a point. The total points available in the 'STAPL Feasibility Chart' ranges from 1 to 14. Figure 6-2 illustrates the STAPL Feasibility Chart that was used for the Step 3 feasibility rating.

Figure 6-2: STAPL Feasibility Chart Used in Step 3 of Prioritization Method

S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)		
Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge

Total Score A total score was assigned to each mitigation action based on the 3-step prioritization process described above.

Total Score: 0-27 = Priority 3
28-35 = Priority 2
36-42 = Priority 1

Mitigation actions receiving the highest scores were rated as Priority 1; those receiving mid-range scores were rated as Priority 2; and mitigation actions receiving the lowest range of scores were rated as Priority 3.

Hazard Mitigation Actions Prioritized by Jurisdiction This section contains Table 6-2, which is a list of hazard mitigation actions prioritized by participating jurisdictions. Included in Table 6-2 is information about the party responsible for implementing the mitigation; funding source(s); and a suggested timeframe for implementation. A Key to Table 6-2 is provided below; Table 6-2 begins on the following page.

Table 6-2: Prioritized Mitigation Actions by Jurisdiction

Table 6-2 Key:

Hazards Addressed	
All	All HMP natural hazards
SS	Severe Storms
SWS	Severe Winter Storms
F	Floods
D	Drought
EH	Extreme Heat
E	Earthquakes

Jurisdiction: Champaign County

Hazards Addressed	Mitigation Action	Priority
All	1) Educate public and disseminate information regarding all hazards to population through town hall meetings, presentations to groups, and displays Responsible Party: Department of Public Health and Champaign County Emergency Management Agency (EMA) Funding Source(s): federal, state, local or grant Suggested Timeframe: ongoing	1
All	2) Offer and promote the use of an area-wide warning text message system such as Alert Sense. Responsible Party: Champaign County EMA and Champaign Department of Public Health Funding Source(s): local Suggested Timeframe: within six months of FEMA approval of HMP	1
All	3) Encourage use of NOAA all-hazard radios in residences and businesses throughout unincorporated area. Responsible Party: Champaign County EMA Funding Source(s): local or grant Suggested Timeframe: ongoing	2
All	4) Provide information to local public radio and television stations regarding emergency warning and public service announcements. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	2
E	5) Distribute information regarding earthquake hazards and safety procedures to all Champaign County school districts on an annual basis. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	3
F	7) Identify and prioritize needed improvements to County maintained roads that flood in heavy rainstorms, blocking or impairing road use and through access by vehicular traffic Responsible Party: Champaign County Highway Department Funding Source(s): local or grant Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	3
F	8) Research potential funding sources to acquire information regarding boundaries of the floodway and 100-year floodplain throughout unincorporated Champaign County. Responsible Party: Champaign County Environment and Land Use Committee Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	3
SS	9) Establish means of activating an advance warning siren and provide advance warning sirens in outlying unincorporated communities that do not yet have one (e.g., Penfield). Responsible Party: Champaign County EMA Funding Source(s): local or grant Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, E	10) Adopt building regulations that require wind-resistant and earthquake-resistant construction measures for critical facilities that house vulnerable populations or that house volatile liquids or hazardous wastes. Responsible Party: Champaign County Planning & Zoning Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, SWS	11) Coordinate countywide voluntary Storm Spotter program. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	3
F	12) For lower flood insurance premiums, consider the cost and benefits of County participation in the Community Rating System. Responsible Party: Champaign County Environment and Land Use Committee Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	3

Jurisdiction: Village of Allerton

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Allerton residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Allerton Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Allerton floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Allerton Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Bondville

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Bondville residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Bondville Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village of Bondville participation in National Flood Insurance Program. Responsible Party: Village of Bondville Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Broadlands

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Broadlands residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Broadlands floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
F	3) Review hazard mitigation options regarding repetitive flood loss property in Broadlands. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3

Jurisdiction: City of Champaign

Hazards Addressed	Mitigation Action	Priority
F	1) Continue to implement plans for the East University Avenue area that contain goals and strategies for removing structures within the Boneyard Creek floodway and mitigating flooding hazards with adequate stormwater detention facilities. Responsible Party: City of Champaign Planning Department and Public Works Department Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	1
F	2) Acquire properties located within the Boneyard Creek floodplain as funding allows and as the properties become available. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	3) Review annually City flood hazard regulations for compliance with NFIP regulations. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	4) Conduct volunteer clean-up of Boneyard Creek (part of the MS4 Stormwater Management Program biannual Community Cleanup Day events). Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	5) Require construction projects located within and adjacent to floodplains to be built in accordance with the provisions of the City floodplain regulations. Responsible Party: City of Champaign Public Works Department, Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	6) Require erosion control plans in accordance with City Regulations to mitigate stormwater pollution. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	7) Require construction of detention basins in accordance with City stormwater regulations. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	8) Complete Boneyard Creek Second Street Reach Project. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: completed by 2012	2
F	9) Locate new buildings with regard to recognized floodplains. Responsible Party: City of Champaign Fire Department and Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	10) Adopt Comprehensive Land Use Plan that guides growth and development to suitable locations and includes goals, objectives and policies related to hazard mitigation. Responsible Party: City of Champaign Planning Department Funding Source(s): local Suggested Timeframe: ongoing	2

continued

SS	11) Maintain City's system of advance warning sirens. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	12) Require back up generators for public assembly buildings and buildings that house dependent populations. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, E, F, SWS	13) Require construction projects to conform to wind, snow load, and seismic provisions of the International Building and International Residential Codes. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	14) Install web-portal system that would allow City employees to work from home in the event of an emergency. Responsible Party: City of Champaign Information Technology Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2
All	15) Disseminate public education information through print, internet and television. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS, SWS	16) Prune and remove trees as needed in public right of way areas. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS	17) Review International Building Codes for adoption by the city as they are published every three years. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: Village of Fisher

Hazards Addressed	Mitigation Action	Priority
F	1) Encourage all Village of Fisher residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	1
F	2) Adopt or amend Village of Fisher floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 years of FEMA approval of HMP	2
F	3) Review hazard mitigation options regarding repetitive flood loss property in Fisher. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3

Jurisdiction: Village of Foosland

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Foosland residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Foosland Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Foosland floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Foosland Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Gifford

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Gifford residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Gifford Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Gifford Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Homer

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Homer residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Homer Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Homer Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Ivesdale

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ivesdale residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ivesdale Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Ivesdale Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Longview

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Longview residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Longview Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Longview Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Ludlow

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ludlow residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ludlow Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Ludlow Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Mahomet

Hazards Addressed	Mitigation Action	Priority
F	1) Adopt or amend Village of Mahomet floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Administer Floodplain Management Ordinance and Stormwater Management Ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	1
SS, EH, E	3) Identify designated shelters and cooling centers. Responsible Party: Village of Mahomet Planner and local EMA representative Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	1
SS	4) Maintain advance warning sirens. Responsible Party: Village of Mahomet Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
All	5) Require back up generators for public assembly buildings and buildings that house dependent populations. Responsible Party: Village of Mahomet Planner and Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
F	6) Administer flood elevation standards within Subdivision Ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	2

continued

Hazards Addressed	Mitigation Action	Priority
SS, SWS, E, F, EH	7) Adopt International Building and International Residential Codes Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
D	8) Adopt a water use ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
SS, SWS, E, F, EH	9) Adopt a minimum housing ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
All	10) Provide emergency patrol and rescue, including access to snowmobiles and 4x4 vehicles. Responsible Party: Village of Mahomet Police and local EMA representative Funding Source(s): local Suggested Timeframe: ongoing	2
All	11) Disseminate public education information through print, internet, and television, including community cable channel. Responsible Party: Village of Mahomet Police Funding Source(s): local Suggested Timeframe: ongoing	2
All	12) Update Comprehensive Land Use Plan to include goals, objectives and policies related to hazard mitigation. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
F	13) Acquire flood-prone properties along Sangamon River for perpetual open space. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SWS	14) Administer a snow emergency ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	3
All	15) Educate public via school presentations. Responsible Party: Village of Mahomet Police Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: Village of Ogden

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ogden residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ogden Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Ogden floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Ogden Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Pesotum

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Pesotum residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Pesotum Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Pesotum Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Philo

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Philo residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Philo Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Philo Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Rantoul

Hazards Addressed	Mitigation Action	Priority
All	1) Maintain redundancy in power grid, capability of Village to generate its own power, and backup power generating capabilities for operation of the Village stormwater, waste water, and municipal buildings. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
EH	2) Identify cooling shelters for vulnerable populations within the Village. Responsible Party: Village of Rantoul Inspection Department. Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	1
SS	3) Require the construction of storm shelters in existing and new mobile home developments. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	1
All	4) Administer a rental inspection program to inspect all rental properties for structural weaknesses, overcrowding, utilities, and roofing. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	1
F	5) Adopt or amend Village of Rantoul floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1

continued

Hazards Addressed	Mitigation Action	Priority
SS, SWS, E, EH	6) Require construction projects to conform to surge protection, energy efficiency, wind, snow load, and seismic provisions of the International Building and International Residential Codes. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS	7) Maintain advance warning sirens. Responsible Party: Village of Rantoul ESDA, Police and Public Works Departments Funding Source(s): local Suggested Timeframe: ongoing	1
All	8) Maintain fiber optic connections to Village wastewater, stormwater, electric and municipal facilities to allow their remote operation in the event they become inaccessible. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	9) Conduct tree trimming and removal program in public right of way areas to prevent damage to overhead electric lines. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	10) Require new developments to bury electrical utilities underground. Responsible Party: Village of Rantoul Power Department and Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, E, F	11) Ensure that anchoring requirements are in place for mobile homes. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS	12) Notify ESDA director, monitor Doppler radar, and send lookouts to monitor tornados when a Tornado Warning is issued. Responsible Party: Village of Rantoul Police Department and ESDA Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	13) Disseminate public education information through print, internet, and television, including community cable channel. Responsible Party: Village of Rantoul Board of Trustees Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
E	14) Conduct rapid visual screening to identify structural and non-structural hazards. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 2 to 4 years of FEMA approval of HMP	2
SS	15) Install surge protection in existing critical facilities. Responsible Party: Village of Rantoul Public Works and Inspection Department Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
All	16) Review International Building Codes for adoption by the Village as they are published every three years. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	2

continued

Hazards Addressed	Mitigation Action	Priority
All	17) Update Comprehensive Land Use Plan to include goals, objectives, and policies related to hazard mitigation. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
F	18) Require construction of detention basins pursuant to Village stormwater detention requirements. Responsible Party: Village of Rantoul Public Works and Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS, F	19) Conduct quarterly meetings of storm drainage committee to identify, prioritize and oversee drainage improvements. Responsible Party: Village Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS	20) Use PA systems in police and fire vehicles to warn citizens in the event that the advance warning sirens fail. Responsible Party: Village of Rantoul Police Department Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: Village of Royal

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Royal residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Royal Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Royal Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Sadorus

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Sadorus residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Sadorus Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Sadorus Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Savoy

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Savoy residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Board of Trustees Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
SS, SWS, EH	3) Identify and maintain storm shelters and cooling centers within the Village. Responsible Party: Village of Savoy Public Works Department and Village Emergency Services Disaster Agency Funding Source(s): local Suggested Timeframe: ongoing	2
F	4) Require construction of detention basins pursuant to stormwater detention requirements in Village subdivision standards. Responsible Party: Village of Savoy Zoning Administrator Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS, F	5) Complete improvements to Village of Savoy storm sewer system to alleviate flooding due to heavy rainfall in old Village of Savoy area. Responsible Party: Village of Savoy Department of Public Works Funding Source(s): local Suggested Timeframe: within 2 to 4 years of FEMA approval of HMP	2
All	6) Adopt a minimum Building Code ordinance. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
SS, SES, F, E	7) Provide emergency patrol and rescue, including access to rescue and 4x4 vehicles. Responsible Party: Village of Savoy Fire Department and Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
All	8) Update the Village of Savoy Comprehensive Land Use Plan to reflect future hazard mitigation actions. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 to 5 years of FEMA approval of HMP	3

Jurisdiction: Village of Sidney

Hazards Addressed	Mitigation Action	Priority
F	1) Encourage all Village of Sidney residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Sidney floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

continued

F	3) Review feasibility of protecting critical facility in Village from flood damage. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	3

Jurisdiction: Village of St. Joseph

Hazards Addressed	Mitigation Action	Priority
F	1) Complete Phase II Improvements to Village stormwater collection system. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: ongoing	1
All	2) Encourage all Village of St. Joseph residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	3) Adopt or amend Village of St. Joseph floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Thomasboro

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Thomasboro residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Thomasboro Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Thomasboro Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Tolono

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Tolono residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Tolono Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Tolono Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: City of Urbana

Hazards Addressed	Mitigation Action	Priority
All	1) Complete installation of emergency back up power systems for remaining essential City facilities such as Fire Stations 2 and 3 and the Civic Center. Responsible Party: City of Urbana Public Works and Fire Departments Funding Source(s): federal and local Suggested Timeframe: within two years of FEMA approval of HMP, or as funding permits	1
All	2) Participate in countywide integrated information base for multi-hazard applications. Responsible Party: Champaign County Regional Planning Commission GIS Consortium and City of Urbana Funding Source(s): local Suggested Timeframe: ongoing	1
All	3) Identify existing buildings as shelters. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
All	4) Offer and promote the use of area-wide warning text message system (e.g., Alert Sense.) Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS	5) Maintain an advance outdoor warning siren system Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	6) Use Risk Watch program in schools. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	7) Educate the public--especially seniors and the disabled--on methods to ensure critical documents can be easily retrieved in case of emergency. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
E	8) Periodically review and update International Building Code requirements concerning seismic resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	9) Periodically review and update International Building Code requirements concerning high wind resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
F	10) Provide back up maintenance of storm water detention basins by amending Subdivision Ordinance to require developers to pre-approve a tax benefit district to include properties served by a detention basin in the event that a property owner association fails to maintain it. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1

continued

Hazards Addressed	Mitigation Action	Priority
F	11) Amend the City of Urbana floodplain management regulations to require a minimum of one-foot freeboard above the 100-year floodplain for new construction. Responsible Party: City of Urbana Community Development Services and Public Works Departments Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	12) Encourage distribution of NOAA all-hazard radios to special needs populations. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2
F	13) Update FEMA Flood Insurance Rate Maps based on a study of the floodway and 100-year floodplain of the Boneyard Creek. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
F	14) Offer zoning transfer of development rights as a tool within the Boneyard Creek District. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	15) Monitor and target financial assistance to improve safety of existing buildings in TIF districts. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS	16) Educate local builders on wind resistant construction techniques. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	17) Trim and tree removal program to reduce limb and tree hazards. Responsible Party: City of Urbana Public Works Department Funding Sources: local Suggested Timeframe: ongoing	2
SS, SWS	18) Improve maintenance and proper species selection in urban forestry. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	19) When appropriate, acquire flood-prone properties along the Boneyard Creek to expand greenways. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS, SWS, E	20) Provide technical support and funding or subsidies to upgrade critical facilities. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, SWS, E	21) Provide technical support and funding or subsidies to upgrade unreinforced masonry buildings in downtown Urbana. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS	22) Educate residents of mobile home parks regarding the location of safe shelters and/or offer shelters within parks. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): federal, state, and local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP, or as funding permits.	3

Jurisdiction: University of Illinois at Urbana-Champaign

Hazards Addressed	Mitigation Action	Priority
All	1) Construct a new Office of Campus Emergency Planning Website Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	2) Incorporate nine emergency notification systems used to alert the campus community Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	3) Assign Building Emergency Coordinators to assist in creation of Building Emergency Action Plans for natural, man-made, and technological disasters. Responsible Party: Office of Campus Emergency Planning Funding Source(s): staff time Suggested Timeframe: within one year of FEMA approval of HMP	1
All	4) Develop and implement the Building Emergency Plan template to be used by campus buildings. Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	1
All	5) Develop and implement the UC-Berkeley Continuity of Operations Plan template. Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	1

Jurisdiction: Parkland College

Hazards Addressed	Mitigation Action	Priority
All	1) Offer and promote the use of an area-wide warning text message system such as Alert Sense. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local and state Suggested Timeframe: within six months of FEMA approval of HMP	1
SS	2) Identify existing buildings as shelters. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	3) Improve Parkland College public safety website. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

References

Multi-Hazard Identification and Risk Assessment. Federal Emergency Management Agency,1997. Washington, DC: FEMA.

Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning How-To Guide Number Eight, FEMA-386-8, Federal Emergency Management Agency, 2006. Washington, DC: FEMA.

Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, Federal Emergency Management Agency, 2008. Washington, DC: FEMA.

Chapter 7 Plan Maintenance

Chapter 7 includes the following HMP components:

- Description of method and schedule for monitoring, evaluating, and updating the mitigation plan within a five-year cycle. *FEMA Requirement § 201.6(c)(4)(i)*
- Description of how the HMP will be incorporated into local planning mechanisms for each jurisdiction. *FEMA Requirement §201.6(c)(4)(ii)*
- Description of how public involvement will be continued in the HMP maintenance process. *FEMA Requirement § 201.6(c)(4)(i)*

Monitoring, Evaluating, and Updating the Plan

The FEMA *Local Multi-Hazard Mitigation Planning Guidance* indicates the following:

> "A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in its priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding."

The Planning Team recommends that, because the HMP is a multi-jurisdictional effort, it should be reviewed on an annual basis, beginning one year after FEMA acceptance. Annual reviews will facilitate improved tracking and record-keeping of progress toward implementation, and allow for an easier, more efficient five-year update. The Planning Team recommends that:

- The HMP Planning Team, as identified in Chapter One, should be retained as the ongoing organization to maintain the HMP, with Planning Team vacancies filled on an as-needed basis.

- Continue to use the 'combination' approach to represent all participating jurisdictions for the annual HMP review and the five-year update. The combination approach allows for direct representation of the seven largest populated jurisdictions and the two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team, with the Planner for Champaign County facilitating the authorized representation of the 19 smaller municipalities on the Planning Team.

- To facilitate the annual HMP review, an easy-to-use survey form should be used to canvass Planning Team members and key municipal representatives of participating jurisdictions regarding changing circumstances, and progress toward implementing mitigation actions for each participating jurisdiction. The survey form could be used by representatives of each participating jurisdiction to report on any changing circumstances that impact the priority of selected mitigation actions for each jurisdiction, or the proposed addition of a mitigation action by a participating jurisdiction.

- The Planner for Champaign County should continue to coordinate the annual review of the HMP and the HMP update on a five-year cycle.

- The Planning Team should meet at least once a year to review the progress of participating jurisdictions toward implementing the HMP mitigation actions. The annual meeting should include an opportunity for Planning Team members to brainstorm and discuss ways to improve the coordination of participating jurisdictions' efforts toward implementing HMP mitigation actions.

- The outcome of the HMP annual review should be a brief that:1) reports significant changing circumstances within the HMP planning area related to natural hazard risk assessment; and 2) includes an update regarding efforts by jurisdictions toward implementing selected mitigation actions over the preceding year, and new mitigation action proposals.

- The five-year HMP update cycle will begin at the time of FEMA acceptance of the HMP. In order that participating jurisdictions can remain eligible for mitigation project grant funding opportunities, the schedule to complete the five-year update should commence 18 months prior to the end of the five-year cycle. This schedule would allow sufficient time for representatives of each participating jurisdiction to review and adopt an update to the HMP, and to allow for FEMA approval of changes to the HMP proposed as part of the five-year update.

Incorporation into Existing Planning Mechanisms

Changes proposed to the HMP as a result of the five-year update to the HMP will be subject to the standard review processes of each participating jurisdiction, as follows:

Table 7-1: Standard Review Process for 5-Year Update

Participating Jurisdiction	***At the beginning of the 18-month HMP update:***	***Once the HMP update is approved by FEMA:***
Parkland College University of Illinois at Urbana-Champaign	…these participating jurisdictions will be directly represented on the Planning Team.	…if a college or university has fully participated in the development and review of the HMP in accordance with 44 CFR *§ 201.6*, it is not necessary for them to approve or adopt the plan as long as it is approved by IEMA.
Champaign County City of Champaign City of Urbana Village of Rantoul Village of Mahomet Village of Savoy Village of St. Joseph	…these participating jurisdictions will be directly represented on the Planning Team.	…the County Board, City Council, or Village Board of each of these participating jurisdictions will need to adopt the HMP update, in order to remain eligible for FEMA mitigation funding.
Village of Allerton Village of Bondville Village of Broadlands Village of Fisher Village of Foosland Village of Gifford Village of Homer Village of Ivesdale Village of Longview Village of Ludlow Village of Ogden Village of Pesotum Village of Philo Village of Royal Village of Sadorus Village of Sidney Village of Thomasboro Village of Tolono	…these participating jurisdictions will need to re-affirm that the Planner for Champaign County is authorized to represent the jurisdiction on the HMP Planning Team.	

The HMP Goal 3 calls for including natural hazard mitigation in local government plans and regulations. HMP Objective 3-b specifically calls for the review of local programs and ordinances to determine how they can better address the impacts of natural hazards.

As the HMP is reviewed annually, and updated every five years, the Planning Team will continue to identify opportunities for incorporating the HMP into local planning mechanisms on behalf of each participating jurisdiction. The planning mechanisms for participating jurisdictions will vary and may include plans, codes, ordinances, regulations, guidelines, and programs.

Continued Public Involvement

Ongoing opportunities for citizen input will remain an essential component of the HMP maintenance process. Efforts to inform the public and to allow for their effective participation as the HMP is reviewed and updated are described as follows:

Interactive HMP Website. The HMP website (http://www.ccrpc.org/HMP) established by the Champaign County Regional Planning Commission will be maintained, providing a means to both share information with the public about development of the Champaign County HMP and to allow public feedback regarding the HMP. The website will continue to include agendas and minutes of the annual Planning Team meeting, and meetings related to the five-year HMP update, plus related documents and links.

Public Notice of Planning Team Meetings. A public notice of each HMP Planning Team Meetings will be published beforehand in The News-Gazette, the newspaper in the County with the largest overall circulation.

Public Service Announcements and Press Releases. PSA's and press releases that include information about opportunities for public participation in the HMP review and five-year updates will be issued.

Public Meeting. Prior to the end of the five-year HMP update cycle, a public meeting will be held before the Champaign County Environment and Land Use Committee. Comments and questions from the public will be accepted at that meeting.

References

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies, FEMA 386-3, Federal Emergency Management Agency, 2003. Washington, DC: FEMA.

Bringing the Plan to Life: Implementing the Hazard Mitigation Plan, FEMA 386-4, Federal Emergency Management Agency, 2003. Washington, DC: FEMA.

Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, Federal Emergency Management Agency, 2008. Washington, DC: FEMA.

Planning and Urban Design Standards, 1st Edition, American Planning Association, John Wiley & Sons, 2006

(name of jurisdiction) _____

(governing body) _____

(address) _____

Adoption Resolution (Draft)

WHEREAS, *(insert name of jurisdiction)*, with the assistance from the Champaign County Regional Planning Commission, has gathered information and prepared the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan; and,

WHEREAS, the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, *(insert the name of jurisdiction)* is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, *(insert the name of the governing body)* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by *(insert the name of the governing body)* that *(insert the name of jurisdiction)* adopts the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this _____ day of _____, 20___ at the meeting of the *(insert the name of the governing body)*.

Insert appropriate signature lines and dates

_____
(Mayor, Village Clerk, County Board Chair, etc…)

Resolutions for Authorized Representation

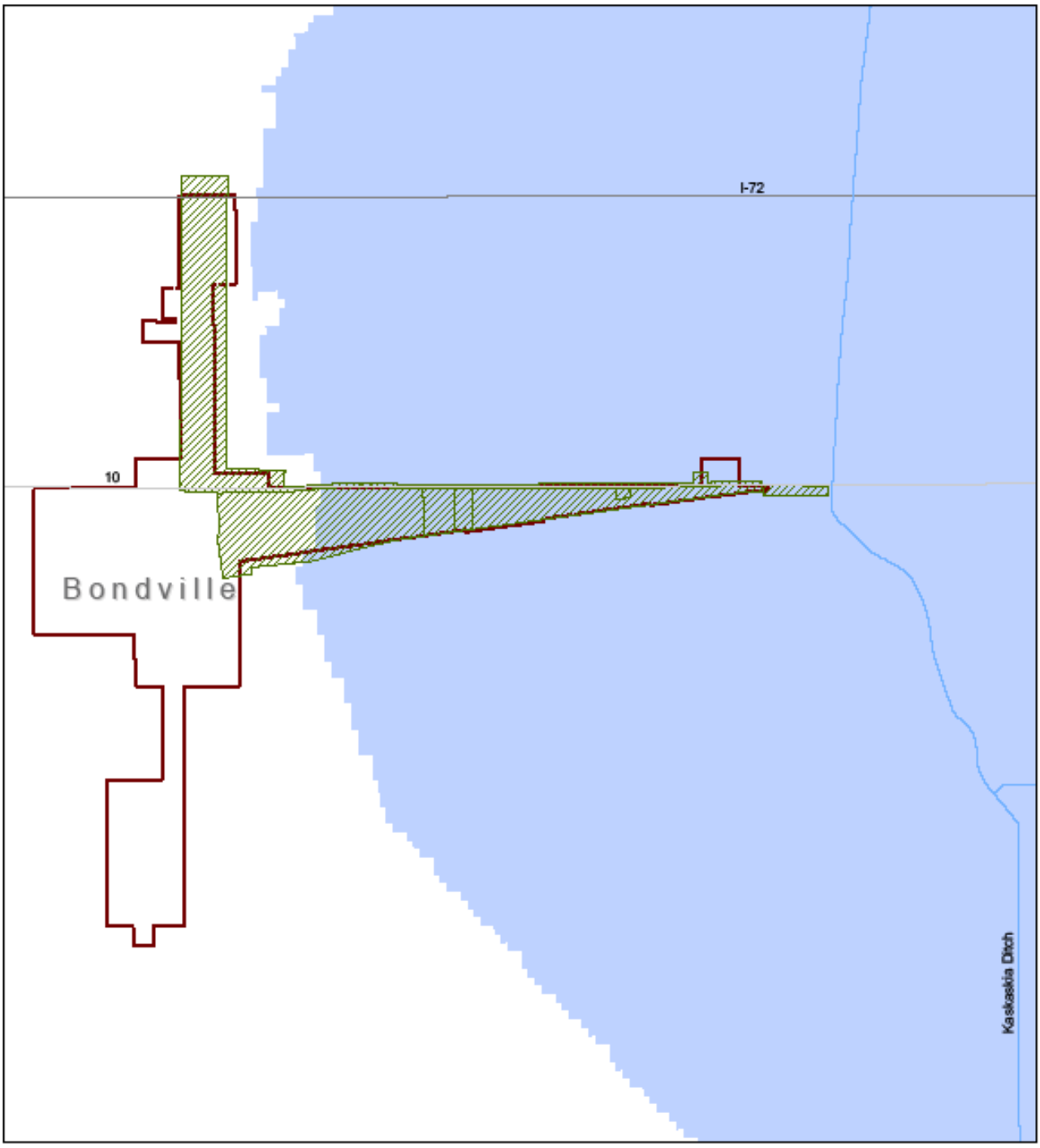
Each participating jurisdiction not directly represented on the Planning Team provided a signed resolution to appoint the Champaign County Regional Planning Commission to act as the authorized representative in the development of the Champaign County Multi-Jurisdictional Hazard Mitigation Plan. Appendix 2 contains a copy of the signed authorizing resolution for each of the following participating jurisdictions:

1)	Village of Allerton	Resolution Authorizing Village of Allerton to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated May 20, 2008
2)	Village of Bondville	Resolution No. 08-04-01 Authorizing Village of Bondville to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 6, 2008
3)	Village of Broadlands	Resolution Authorizing Village of Broadlands to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 6, 2008
4)	Village of Fisher	Resolution Authorizing Village of Fisher to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 14, 2008
5)	Village of Foosland	Resolution Authorizing Village of Foosland to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated January 14, 2008
6)	Village of Gifford	Resolution Authorizing Village of Gifford to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 7, 2008
7)	Village of Homer	Resolution Authorizing Village of Homer to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 11, 2008
8)	Village of Ivesdale	Resolution Authorizing the Village of Ivesdale to Participate in the Development of a Multi Jurisdictional Mitigation Plan dated February 18, 2008
9)	Village of Longview	Resolution Authorizing Village of Longview to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 20, 2008
10)	Village of Ludlow	Resolution 08-1: Resolution Authorizing Village of Ludlow to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
11)	Village of Ogden	Resolution Authorizing Village of Ogden to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 7, 2008
12)	Village of Pesotum	Resolution Authorizing Village of Pesotum to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated March 5, 2008
13)	Village of Philo	Resolution No. 2008–1: Resolution Authorizing Village of Philo to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 13, 2008
14)	Village of Royal	Resolution Authorizing Village of Royal to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 11, 2008
15)	Village of Sadorus	Resolution Authorizing Village of Sadorus to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated May, 2008
16)	Village of Sidney	Resolution Authorizing Village of Sidney to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
17)	Village of St. Joseph	Resolution No. 2008–2: Resolution Authorizing Village of St. Joseph to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 12, 2008
18)	Village of Thomasboro	Resolution Authorizing Village of Thomasboro to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
19)	Village of Tolono	Resolution Authorizing Village of Tolono to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February May 20, 2008

Jurisdiction Specific Vulnerability Assessments

Flood hazards from a 100 year flood event do not threaten all of the jurisdictions in the HMP planning area. The HAZUS model predicts that the following jurisdictions will sustain damage in such an event: Village of Bondville; unincorporated Champaign County; City of Champaign; Village of Fisher; Village of Ivesdale; Village of Mahomet; Village of Rantoul; Village of Royal; Village of Sadorus; Village of Sidney; Village of St. Joseph; City of Urbana; Parkland College; and the University of Illinois at Urbana-Champaign.

Preceding the description of the estimated 100-year flood damage to each of the above-noted jurisdictions, a map is shown to indicate municipal boundaries and the census blocks which contain areas within the 100 year flood plain. The HAZUS model was used to analyze and calculate estimated damage to these blocks. The census blocks do not in all cases align exactly with the municipal boundaries of the jurisdiction.



Bondville
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.125 0.25 Miles

Date of Preparation: August 2008

Village of Bondville

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-1: Expected Bondville Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	1	1
Religion	0	0	0	0	0	0	0
Residential	0	0	3	5	15	19	42
TOTAL	**0**	**0**	**3**	**5**	**15**	**20**	**43**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-2: Expected Bondville Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	7	7
Masonry	0	0	0	1	4	3	8
Steel	0	0	0	0	0	0	0
Wood	0	0	3	4	11	10	28
TOTAL	**0**	**0**	**3**	**5**	**15**	**20**	**43**

* Substantially damaged means greater than 50% of the building has been damaged

The following table displays the building related economic loss estimates in Bondville resulting from the 100 year flood event.

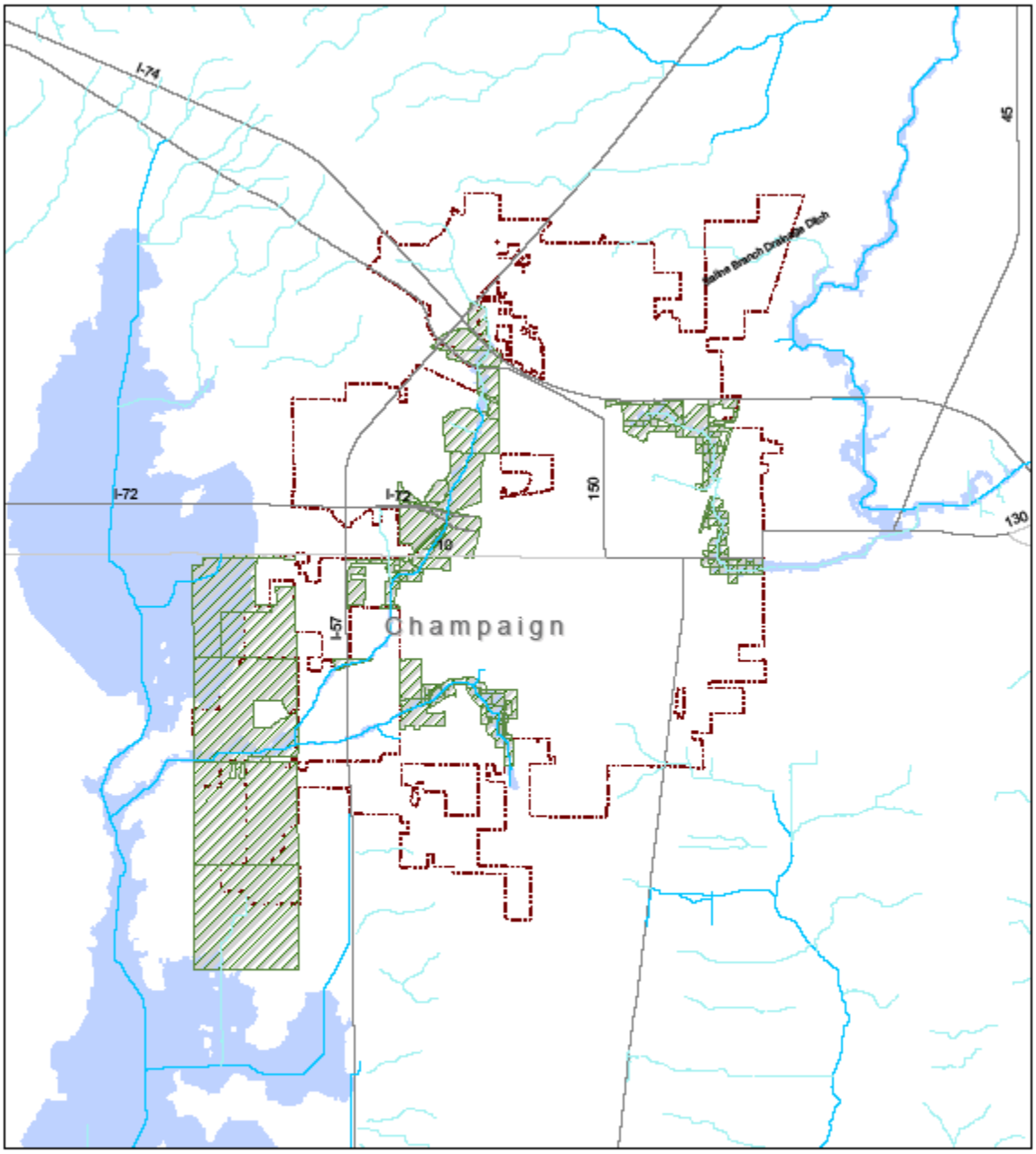
Table A3-3: Bondville Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3,338	31	497	240	4,106
	Content	1,769	112	618	434	2,933
	Inventory	0	9	120	85	214
	Subtotal	5,107	152	1,235	759	7,253
Business Interruption						
	Income	0	0	0	3	3
	Relocation	7	0	0	0	7
	Rental Income	1	0	0	0	1
	Wage	0	0	0	7	7
	Subtotal	8	0	0	10	18
ALL	**Total**	**5,115**	**152**	**1,235**	**769**	**7,271**

Critical Facility Damage in Bondville
The HAZUS model does not predict that any of the critical facilities in the Village of Bondville will sustain damage.

Debris Generation in Bondville
The model predicts that a total of 1,108 tons of debris will be generated as a result of the flood. Of this debris, 493 tons will be finishing materials, 330 tons will be structural materials, and 285 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 45 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Bondville HAZUS estimates that 143 people will be displaced as a result of flood damage. Also estimated is that, of this group, 112 people will seek temporary shelter in public shelters.



Champaign
Boundary Definition

Legend

- Census Blocks in Flood plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- State Hwy
- Interstates
- Federal hwy

N

0 0.5 1 2 Miles

Date of Preparation: August 2008

City of Champaign

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-4: Expected Champaign Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Greater than 50%	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	3	0	0	2	0	5
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	2	9	30	54	111	206
TOTAL	**0**	**5**	**9**	**30**	**56**	**111**	**211**

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-5: Expected Champaign Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Greater than 50%	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	14	14
Masonry	0	1	0	2	9	14	26
Steel	0	1	0	0	0	0	1
Wood	0	2	9	28	46	83	168
TOTAL	**0**	**4**	**9**	**30**	**55**	**111**	**209**

The following table displays the building related economic loss estimates in Champaign resulting from the 100 year flood event.

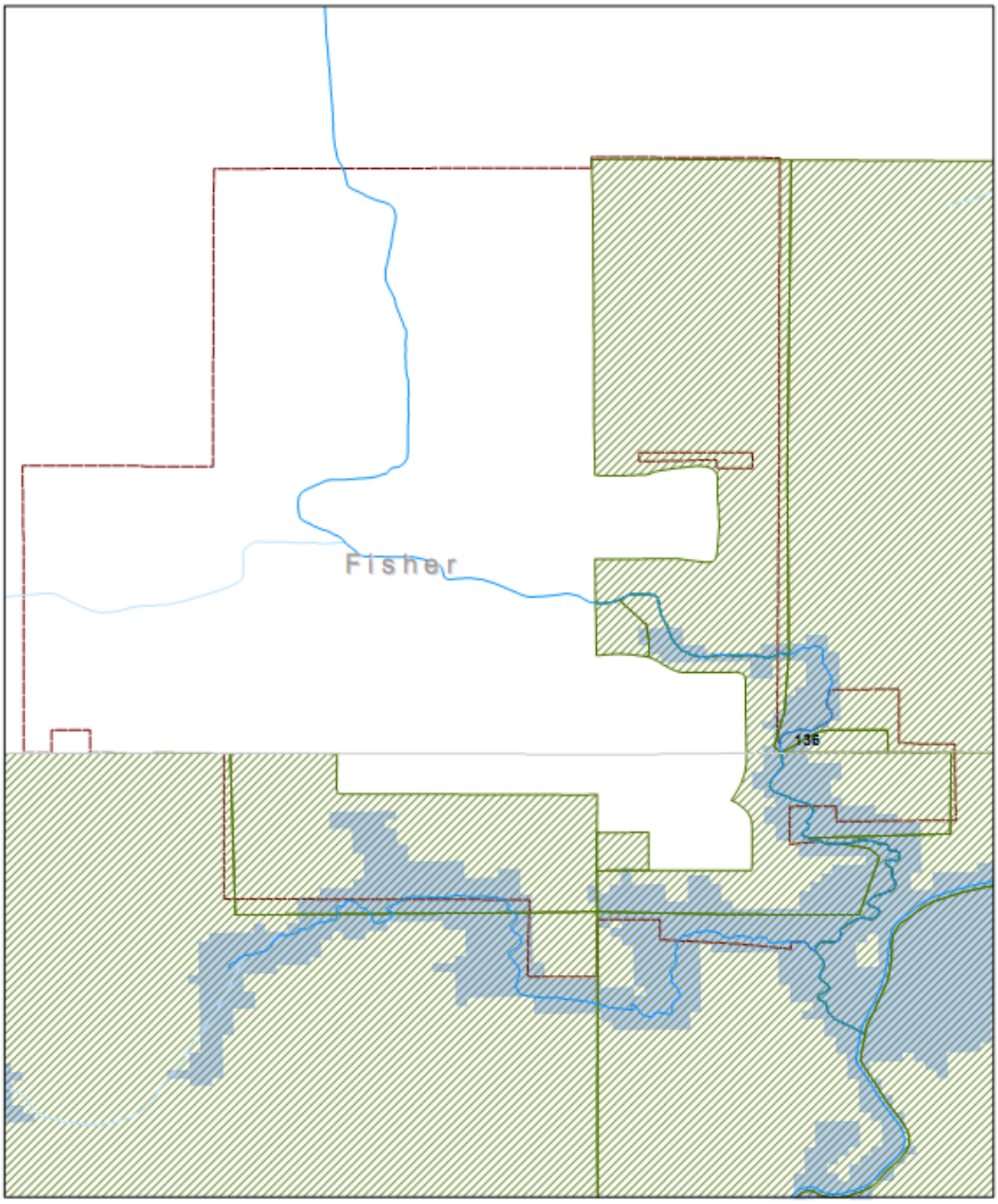
Table A3-6: Champaign Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	57,072	14,639	1,136	4,901	77,748
	Content	33,275	31,049	2.090	20,555	86,969
	Inventory	0	500	226	37	763
	Subtotal	90,347	46,188	3,452	25,493	165,480
Business Interruption						
	Income	6	224	0	24	254
	Relocation	75	49	0	1	125
	Rental Income	49	32	0	0	0
	Wage	13	238	0	783	1,034
	Subtotal	143	543	0	808	1,413
ALL	**Total**	**90,490**	**46,731**	**3,452**	**26,301**	**166,893**

Critical Facility Damage in Champaign
HAZUS predicts that only one critical facility in Champaign will be damaged in a 100 year flood event. This facility is a nursing home which is categorized as a 'Facility of Local Importance'. HAZUS predicts that the building will be 38% damaged. Damage to the building is estimated at $5,980,000. The model predicts that 70% of the contents of the building will be lost. The value of these lost contents is estimated to be $16,290,000. It is estimated that it will take 720 days for the nursing home to regain 100% of its pre-event functionality.

Debris Generation in Champaign
The model predicts that a total of 26,970 tons of debris will be generated as a result of the flood. Of this debris: 8,509 tons will be finishing materials;11,017 tons will be structural materials; and 7,444 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1,079 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Champaign
HAZUS estimates that 3,137 people will be displaced as a result of flood damage. Also estimated is that, of this group, 2,656 people will seek temporary shelter in public shelters.



Fisher

Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Streams
- Intermittent Streams
- Interstates
- StateHwys
- FedHwys

N

0 0.09 0.18 Miles

Date of Preparation: August 2008

Village of Fisher

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-7: Expected Fisher Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	14	19
TOTAL	**0**	**0**	**0**	**1**	**4**	**14**	**19**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-8: Expected Fisher Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	4	4
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	10	15
TOTAL	**0**	**0**	**0**	**1**	**4**	**14**	**19**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Fisher resulting from the 100 year flood event.

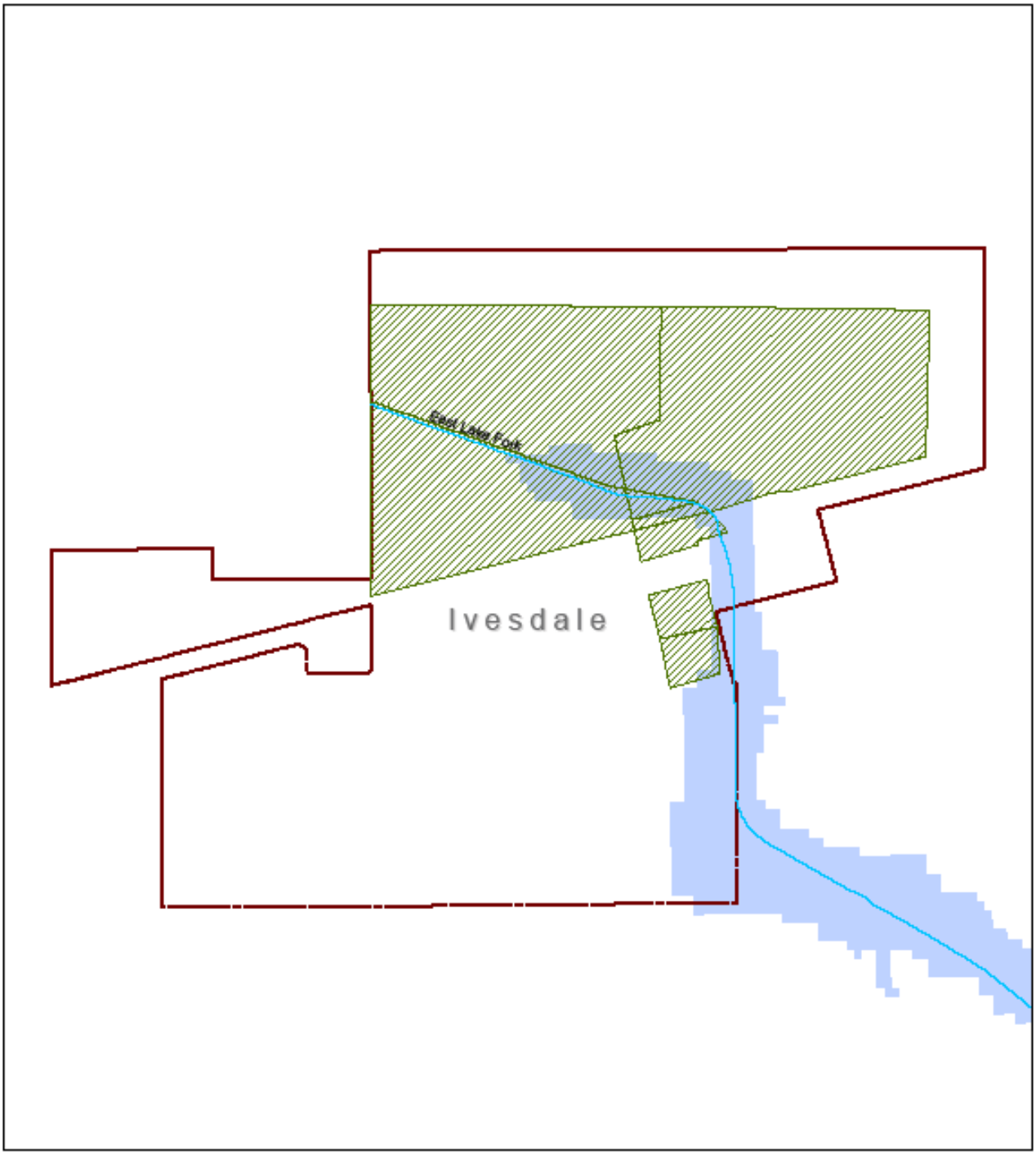
Table A3-9: Fisher Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2,746	51	30	49	2,876
	Content	1,334	117	34	54	1,539
	Inventory	0	0	7	10	17
	Subtotal	4,080	168	71	113	4,432
Business Interruption						
	Income	0	0	0	0	0
	Relocation	5	0	0	0	5
	Rental Income	1	0	0	0	1
	Wage	0	2	0	1	3
	Subtotal	6	2	0	1	9
ALL	**Total**	**4,086**	**170**	**71**	**114**	**4,441**

Critical Facility Damage in Fisher
HAZUS predicts that two critical facilities in Fisher will be damaged in a 100 year flood event. The first facility is the Fisher Sewage Treatment Plant, which falls into the category of Utility Lifelines. HAZUS predicts that the facility will be 40% damaged. Translated into dollars, damage to the building is estimated at $29,570,000. This event would render the plant inoperable until repairs are completed. The second facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under $1000.

Debris Generation in Fisher
The model predicts that a total of 1,394 tons of debris will be generated as a result of the flood. Of this debris, 332 tons will be finishing materials, 604 tons will be structural materials, and 457 tons will be foundation materials. If the debris tonnage is converted into truckloads it will require 56 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Fisher
HAZUS estimates that 91 people will be displaced as a result of flood damage. Also estimated is that, of this group, 68 people will seek temporary shelter in public shelters.



Ivesdale
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.125 0.25 Miles

Date of Preparation:
August 2008

Village of Ivesdale

Building Damage in Ivesdale

HAZUS predicts minimal building damage in Ivesdale. HAZUS calculated $254,000 in residential building damage, and $117,000 in residential building content loss. Additionally there would be approximately $12,000 in agricultural building damage, $24,000 in agricultural building content loss, and $5000 in agricultural inventory loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Ivesdale

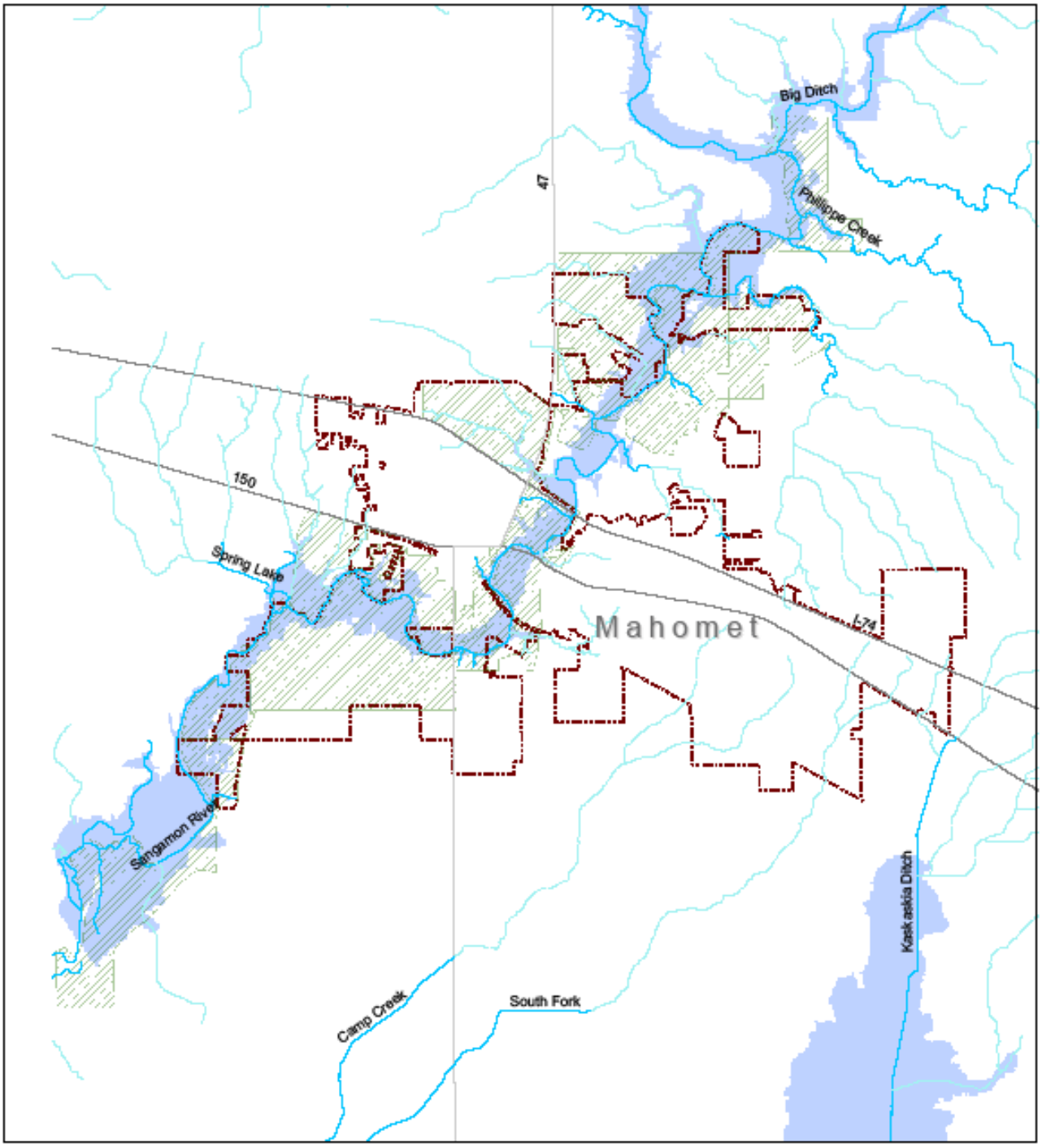
According to the model, none of the critical facilities in Ivesdale will sustain damage in a 100 year flood event.

Debris Generation in Ivesdale

The model predicts that a total of 109 tons of debris will be generated as a result of the flood. Of this debris, 31 tons will be finishing materials, 43 tons will be structural materials, and 34 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 5 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Ivesdale

HAZUS estimates that 9 people will be displaced as a result of flood damage, and that none of these people will seek publicly provided shelter.



Mahomet

Boundary Definition

Legend

- Census Block in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State hwy

N

0 0.5 1 Miles

Date of Preparation: August 2008

Village of Mahomet

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-10: Expected Mahomet Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	152	157
TOTAL	**0**	**0**	**0**	**1**	**4**	**152**	**157**

* Substantially damaged means greater than 50% of the building has been damaged

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-11: Expected Mahomet Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	24	24
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	128	133
TOTAL	**0**	**0**	**0**	**1**	**4**	**152**	**157**

*Substantially damaged means greater than 50% of the building has been damaged

The following table displays the building related economic loss estimates in Mahomet resulting from the 100 year flood event.

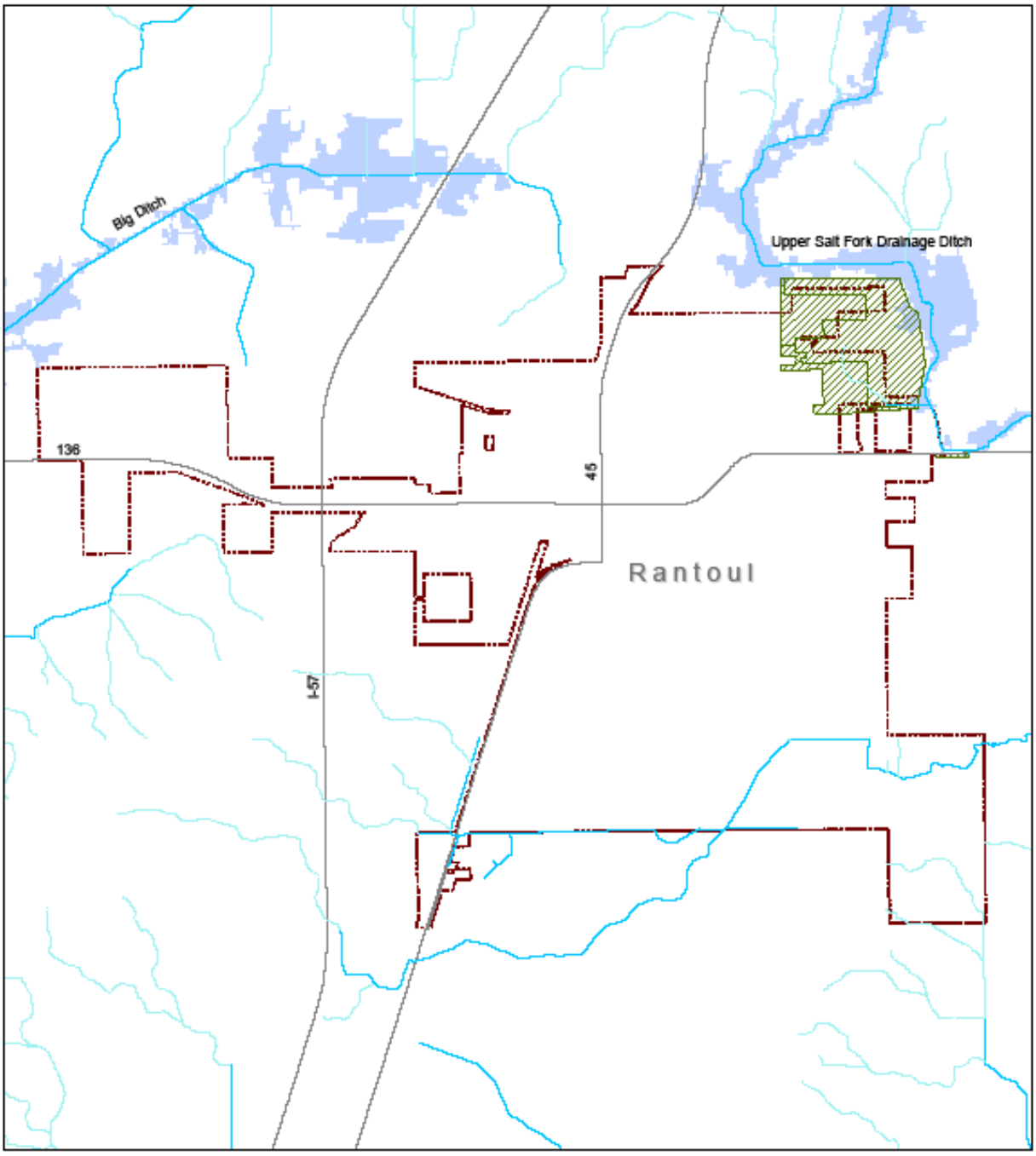
Table A3-12: Mahomet Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	31,506	2,690	171	610	34,977
	Content	15,040	3,725	201	681	19,647
	Inventory	0	56	38	44	138
	Subtotal	46,546	6,471	410	1335	54,762
Business Interruption						
	Income	18	19	0	2	39
	Relocation	37	3	0	0	40
	Rental Income	40	1	0	0	41
	Wage	42	26	0	16	84
	Subtotal	137	49	0	18	204
ALL	**Total**	**46,683**	**6,520**	**410**	**1353**	**54,966**

Critical Facility Damage in Mahomet
HAZUS predicts that three critical facilities in Mahomet will be damaged in a 100 year flood event. Two facilities are sewage water treatment plants. The first facility is the Mahomet Sewage Treatment Plant which falls into the category of Utility Lifelines. HAZUS predicts that the facility will be 30% damaged. Translated into dollars damage to the building is estimated at $22,100,000. The second plant is the Sangamon Valley PWD Sewage Treatment Plant. The model predicts that this facility will be 40% damaged. Translated into dollars, damage to the facility is estimated at $29,570,000. As a result of the damage, the plants will be rendered inoperable until repairs are made. The third facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under $1000.

Debris Generation in Mahomet
The model predicts that a total of 18,550 tons of debris will be generated as a result of the flood. Of this debris, 3,430 tons will be finishing materials, 9,053 tons will be structural materials, and 6,067 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 742 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Mahomet
HAZUS estimates that 655 people will be displaced as a result of flood damage. Also estimated is that, of this group, 515 people will seek temporary shelter in public shelters.



Rantoul
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.35 0.7 Miles

Date of Preparation: August 2008

Village of Rantoul

Building Damage in Rantoul

HAZUS predicts minimal building damage in Rantoul. When the model did its calculations for the amount of damage to buildings it came up with a figure of $36,000 in residential building damage, and $19,000 in residential building content loss. Additionally it is estimated that there would be $4,000 in commercial building damage, and $9,000 in commercial building content loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Rantoul

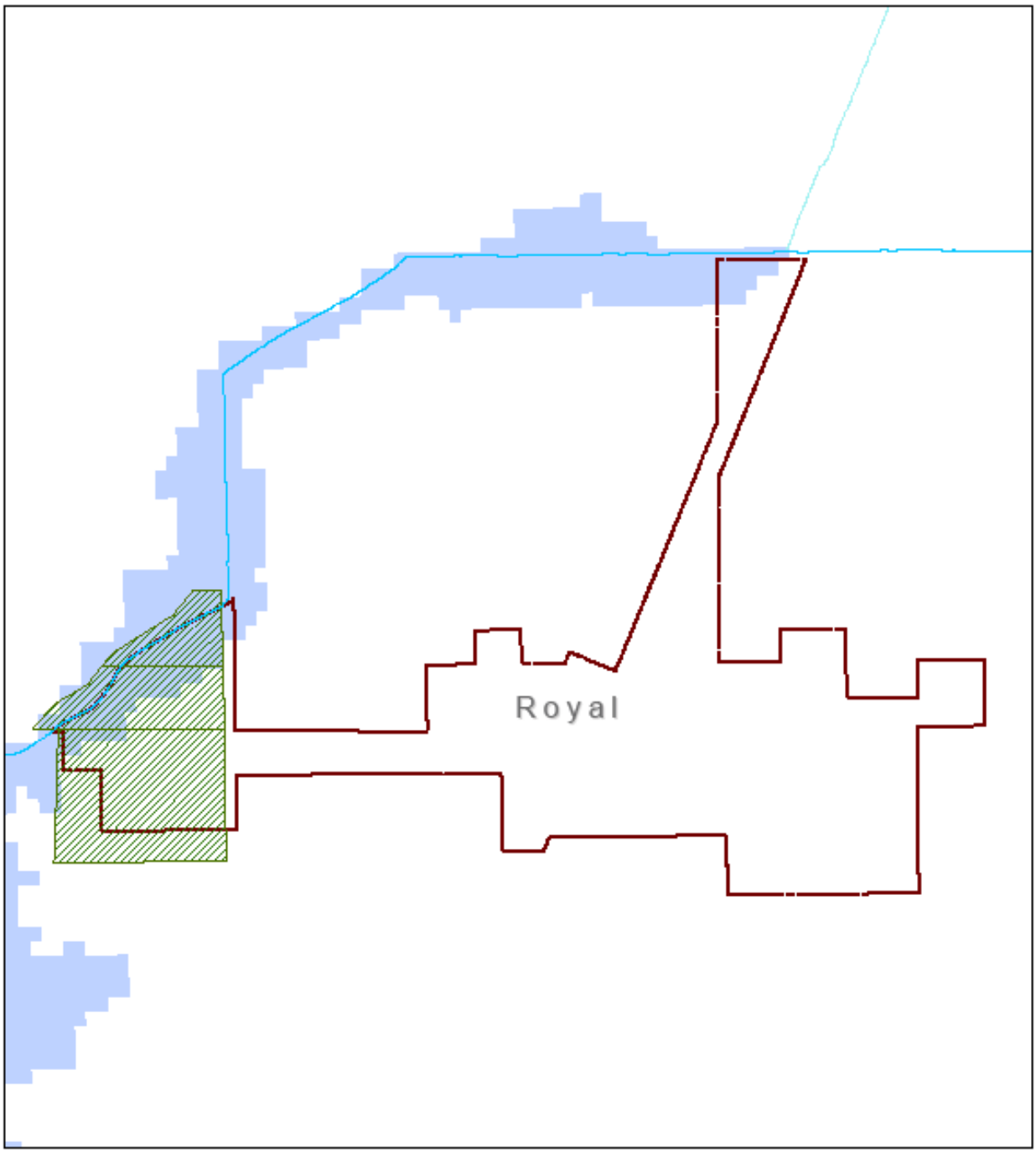
According to the HAZUS model, none of the critical facilities in Rantoul will sustain damage in a 100 year flood event.

Debris Generation in Rantoul

The model predicts that a total of only 9 tons of debris will be generated as a result of the flood. Of this debris, 5 tons will be finishing materials, 2 tons will be structural materials, and 2 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1 truckload (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Rantoul

HAZUS estimates that 5 people will be displaced as a result of flood damage, and that none of these people will seek publicly provided shelter.



Royal

Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.05 0.1 Miles

Date of Preparation: August 2008

Village of Royal

Building Damage in Royal

HAZUS predicts minimal building damage in Royal. The model calculated $270,000 in residential building damage, and $147,000 in residential building content loss. Additionally there would be approximately $3,000 in agricultural building damage, $5,000 in agricultural building content loss, and $1,000 in agricultural inventory loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Royal

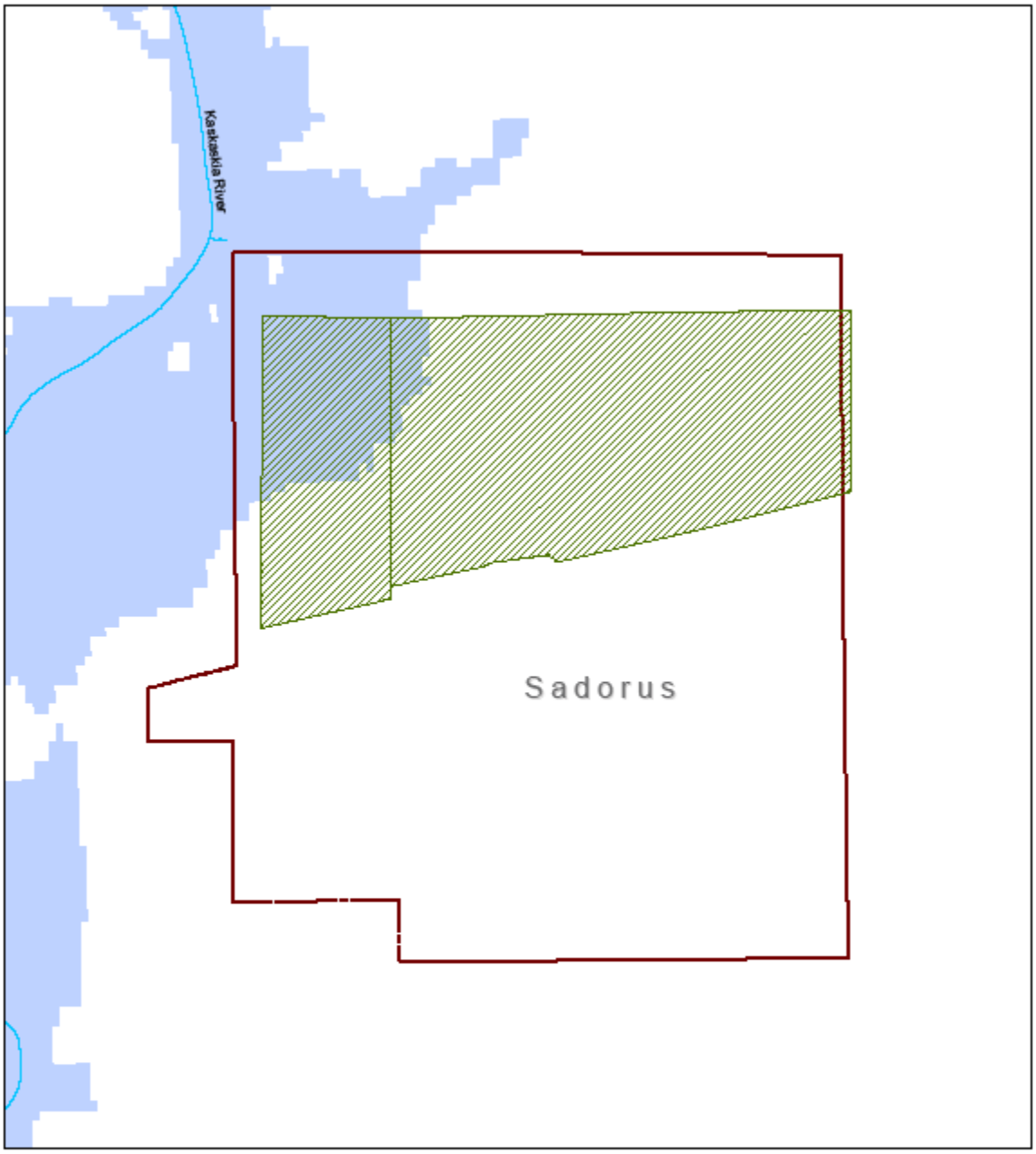
According to the model, none of the critical facilities in Royal will sustain damage in a 100 year flood event.

Debris Generation in Royal

The model predicts that a total of 106 tons of debris will be generated as a result of the flood. Of this debris, 35 tons will be finishing materials, 42 tons will be structural materials, and 28 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 5 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Royal

HAZUS estimates that 15 people will be displaced as a result of flood damage. Also estimated is that two of these people will seek temporary shelter in publicly provided shelters.



Sadorus
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- State Hwy
- Interstates
- Federal hwy

N

0 0.125 0.25 Miles

Date of Preparation: August 2008

Village of Sadorus

Building Damage in Sadorus

HAZUS predicts minimal building damage in Sadorus. When the model calculated the amount of damage to buildings, it came up with a figure of $403,000 in residential building damage, and $212,000 in residential building content loss. Additionally there would be approximately $170,000 in commercial building damage, $462,000 in commercial building content loss, and $27,000 in commercial inventory loss. HAZUS suggests that at least one residence will sustain greater than 50% damage.

Critical Facility Damage in Sadorus

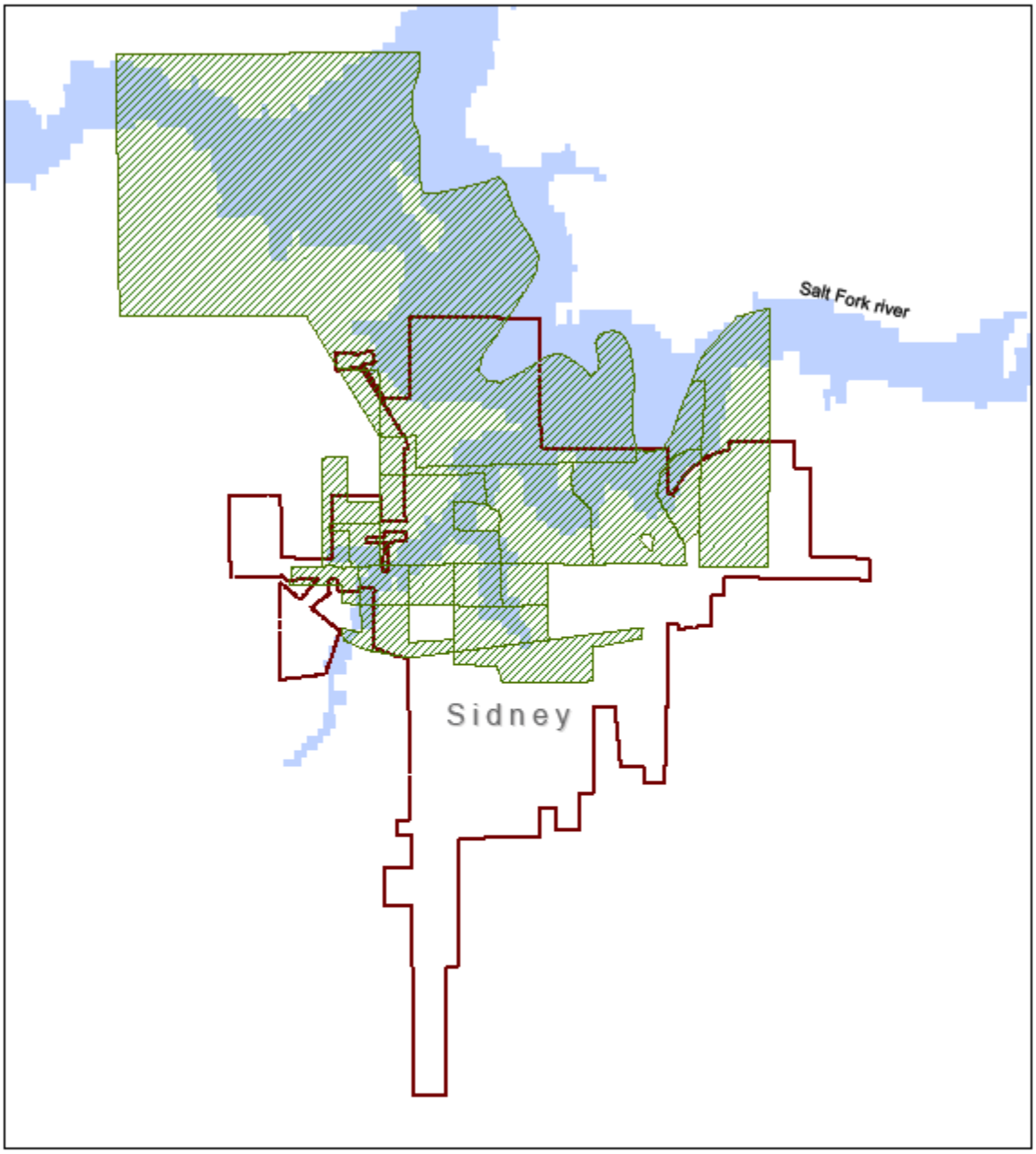
According to the model, none of the critical facilities in Sadorus will sustain damage in a 100 year flood event.

Debris Generation in Sadorus

The model predicts that a total of 247 tons of debris will be generated as a result of the flood. Of this debris, 56 tons will be finishing materials, 109 tons will be structural materials, and 82 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 50 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Sadorus

HAZUS estimates that 21 people will be displaced as a result of flood damage. Also estimated is that six of these people will seek temporary shelter in publicly provided shelters.



Sidney
Boundary Definition

Legend

- Census Block in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State hwy

N

0 0.15 0.3 Miles

Date of Preparation: August 2008

Village of Sidney

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-13: Expected Sidney Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	27	3
TOTAL	**0**	**0**	**0**	**1**	**4**	**27**	**32**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-14: Expected Sidney Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	3	3
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	24	29
TOTAL	**0**	**0**	**0**	**1**	**4**	**24**	**32**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Sidney resulting from the 100 year flood event.

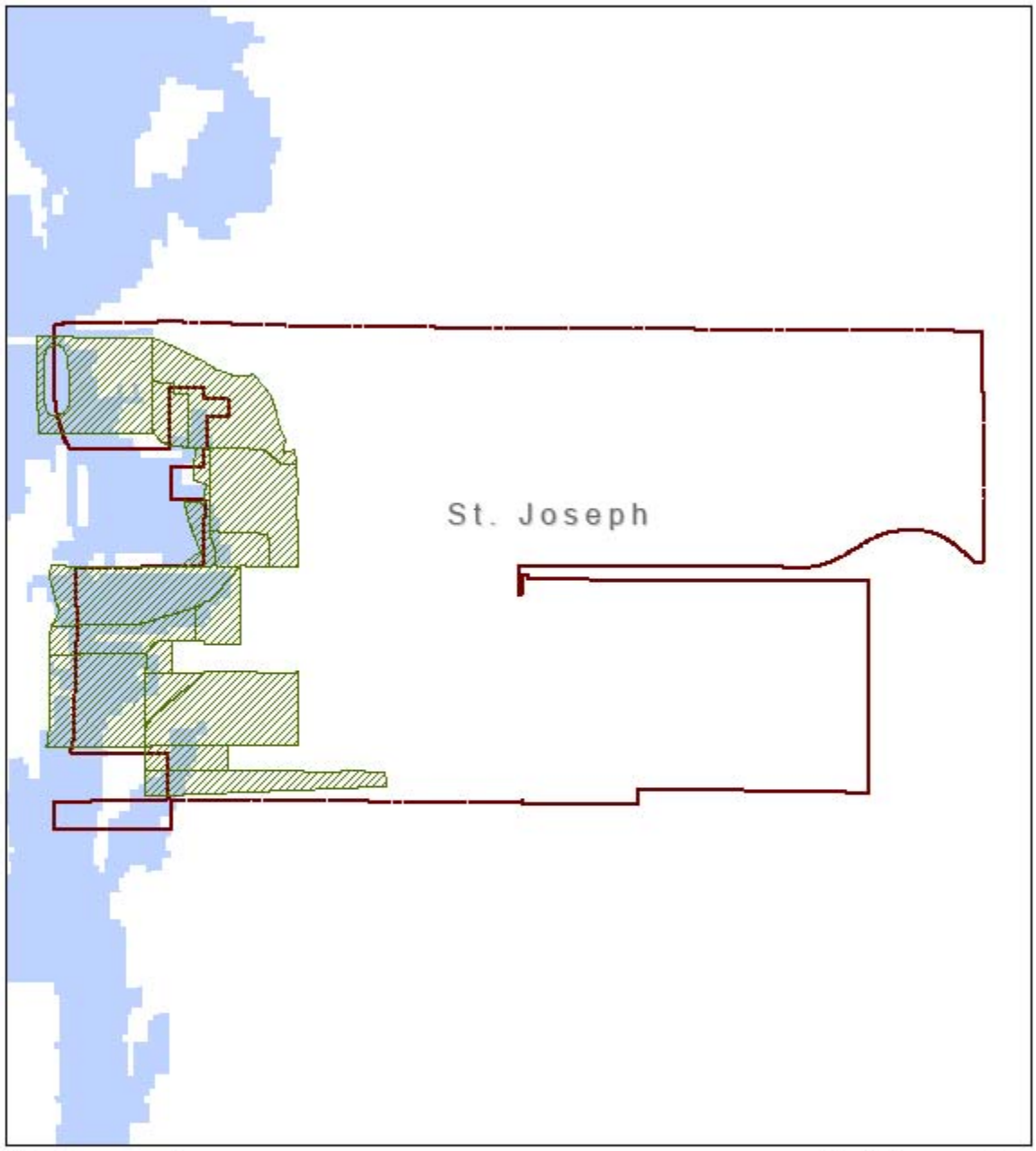
Table A3-15: Sidney Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6,322	275	141	94	6,832
	Content	2,975	511	290	161	3,937
	Inventory	0	7	42	9	58
	Subtotal	9,297	793	473	264	10,827
Business Interruption						
	Income	0	3	0	0	3
	Relocation	9	0	0	0	9
	Rental Income	3	0	0	0	3
	Wage	0	4	0	18	22
	Subtotal	1	7	0	18	3
ALL	**Total**	**9,309**	**800**	**473**	**282**	**10,864**

Critical Facility Damage in Sidney
HAZUS predicts that only one critical facility in Sidney will be damaged in a 100 year flood event. This facility is the Sidney Disaster Agency, which falls into the category of Essential Facilities. HAZUS predicts that the building itself will be 17% damaged. Translated into dollars, damage to the building is estimated at $190,650. Additionally, 81% of the contents of the building will be destroyed. Translated into dollars this will be a loss of $1,356,000.

Debris Generation in Sidney
The model predicts that a total of 3,461 tons of debris will be generated as a result of the flood. Of this debris, 718 tons will be finishing materials, 1,545 tons will be structural materials, and 1,199 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 138 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Sidney
HAZUS estimates that 181 people will be displaced as a result of flood damage. Also estimated is that, of this group, 123 people will seek temporary shelter in public shelters.



St. Joseph
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.15 0.3 Miles

Date of Preparation: August 2008

Village of St. Joseph

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-16: Expected St. Joseph Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	0	2	18	20
TOTAL	**0**	**0**	**0**	**0**	**2**	**18**	**20**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-17: Expected St. Joseph Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0
Wood	0	0	0	0	2	18	20
TOTAL	**0**	**0**	**0**	**0**	**2**	**18**	**20**

* Substantially damaged means greater than 50% of the building has been damaged.

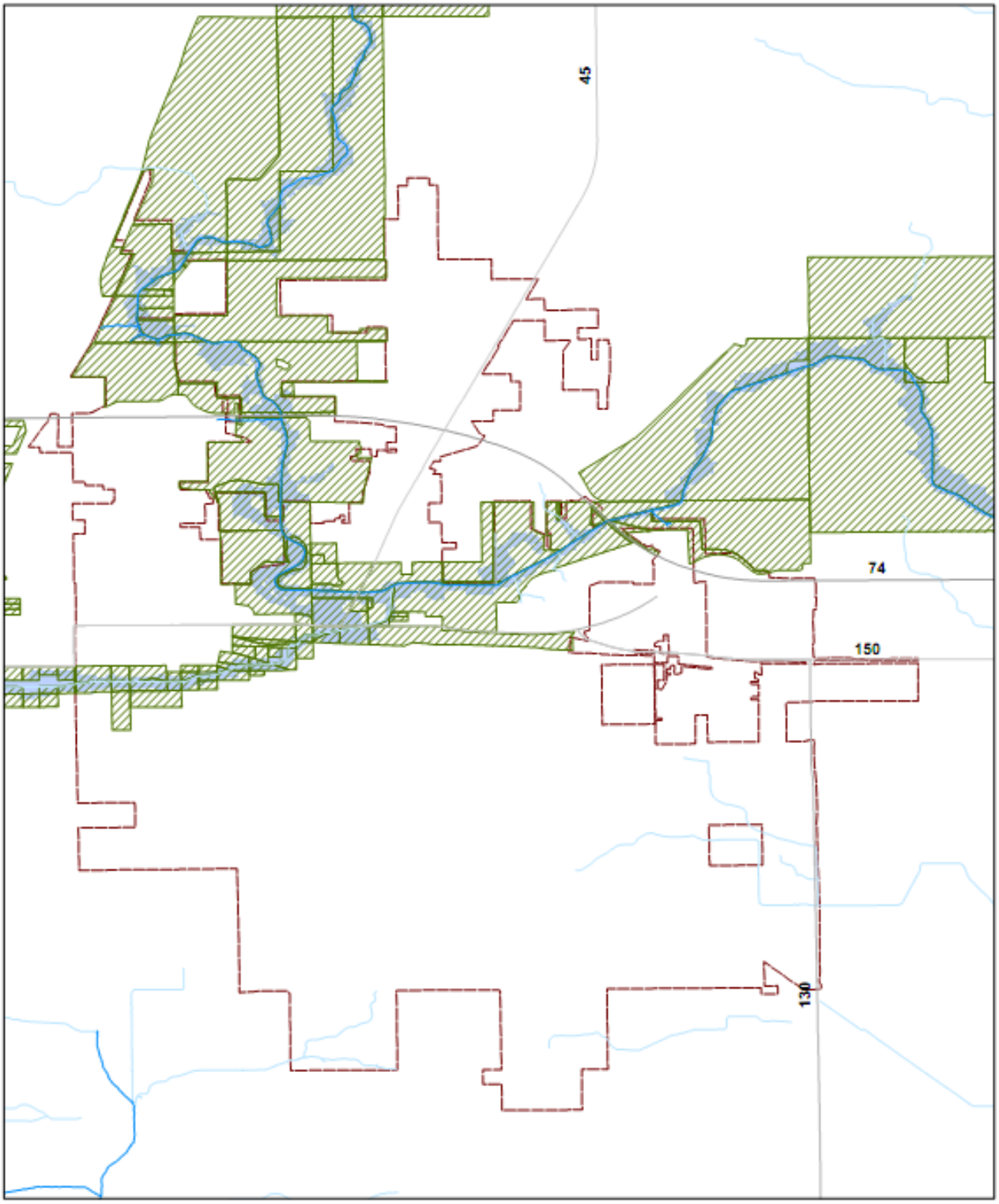
Table A3-18: St. Joseph Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4,448	226	29	33	4,736
	Content	2,075	309	33	68	2,485
	Inventory	0	1	7	0	8
	Subtotal	6,523	536	69	101	7,229
Business Interruption						
	Income	0	2	0	0	2
	Relocation	6	0	0	0	6
	Rental Income	0	0	0	0	0
	Wage	0	2	0	3	5
	Subtotal	6	4	0	3	13
ALL	**Total**	**6,529**	**540**	**69**	**104**	**7,242**

Critical Facility Damage in St. Joseph
HAZUS predicts that one critical facility in St. Joseph will be damaged in a 100 year flood event. This facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under $1000.

Debris Generation in St. Joseph
The model predicts that a total of 2,472 tons of debris will be generated as a result of the flood. Of this debris, 541 tons will be finishing materials, 1,088 tons will be structural materials, and 844 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 99 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in St. Joseph
HAZUS estimates that 144 people will be displaced as a result of flood damage. Also estimated is that, of this group, 42 people will seek temporary shelter in public shelters.



Urbana

Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Streams
- Intermittent Streams
- Interstates
- StateHwys
- FedHwys

N

0 0.5 1 Miles

Date of Preparation: August 2008

City of Urbana

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-19: Expected Urbana Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	3	3
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	2	9	50	61
TOTAL	**0**	**0**	**0**	**2**	**9**	**53**	**64**

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-20: Expected Urbana Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	1	1
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	4	5
Steel	0	0	0	0	0	1	1
Wood	0	0	0	2	8	18	28
TOTAL	**0**	**0**	**0**	**2**	**9**	**24**	**35**

* Substantially damaged means greater than 50% of the building has been damaged.

Table A3-21: Urbana Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	24,464	9,032	837	16,906	51,239
	Content	14,107	15,242	1,756	44,227	75,332
	Inventory	0	447	218	2	667
	Subtotal	38,571	24,721	2,811	61,135	127,238
Business Interruption						
	Income	1	91	0	44	136
	Relocation	21	26	0	0	47
	Rental Income	24	17	0	0	41
	Wage	2	89	0	286	377
	Subtotal	48	223	0	330	601
ALL	**Total**	**38,619**	**24,944**	**2.811**	**61,465**	**127,839**

Critical Facility Damage in Urbana
HAZUS predicts that 3 critical facilities in Urbana will be damaged in a 100 year flood event.

The first facility is University of Illinois High School. The model predicts that the building will sustain 9% damage, which is $52,430 when translated into dollars. 66% of the contents of the building valued at $365,140 will also be lost.

The second facility that will sustain damage is the Playtime Preschool in Urbana. Building damage is estimated at 7% or $41,350 and content loss is estimated at 41% with a value of $229,620.

The third facility which is predicted to be damaged is the Urbana-Champaign Sanitary District Northeast Sewage Treatment Plant. The model predicts that this plant will be rendered inoperable and sustain 30% damage or an estimated $22,177,000. The Executive Director of the Urbana-Champaign Sanitary District provided the following comment regarding the HAZUS model estimate of damage to the Northeast Plant:

> "The District is presently engaged in projects that will completely protect this facility from a 100-year plus flood event. While one of these projects won't be completed for at least one year, the District's past experience with flooding at this plant indicates that the amount of damage that would be sustained if a 100-year event occurred before the improvements are completed would be minimal and there would be only minor impacts on treatment plant performance. The District actually experienced just such an event in 1993… with only very minimal actual damage and a few days disruption in some operations. Most of the pathways

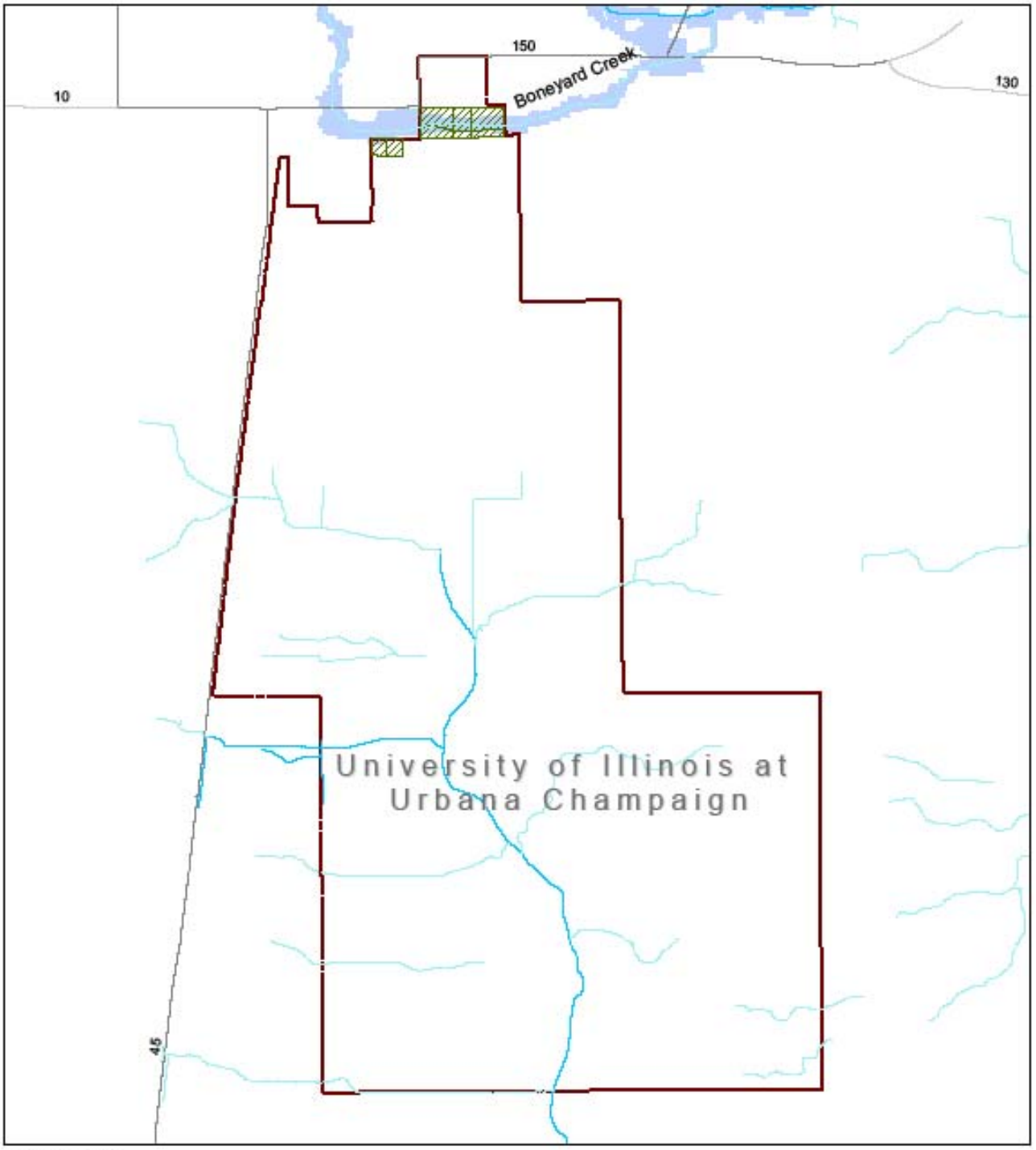
that caused those issues have already been eliminated, and the current projects will protect against the remainder. A damage estimate of more than $22 million as stated … is vastly exaggerated."

Debris Generation in Urbana

The model predicts that a total of 14,824 tons of debris will be generated as a result of the flood. Of this debris, 4,073 tons will be finishing materials, 6,151 tons will be structural materials, and 4,600 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 593 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Urbana

HAZUS estimates that 1,273 people will be displaced as a result of flood damage. Also estimated is that, of this group, 1,130 people will seek temporary shelter in public shelters. A lot of these individuals will be displaced due to the inoperability of the sewage treatment plant.



UIUC

Boundary Definition

Legend

- Census Blocks in Flood Plain
- University Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.35 0.7 Miles

Date of Preparation:
August 2008

University of Illinois

Building Damage at the University of Illinois

Although HAZUS did not specify the exact location of damaged buildings for the University, it predicts some building damage for structures located in the floodplain. The model calculated $766,000 in residential building damage, and $1,261,000 in residential building content loss. Additionally there would be approximately $511,000 in commercial building damage, $1,080,000 in commercial building content loss, and $29,000 in commercial inventory loss. Also associated with commercial building damage, there would be an estimated $1,000 in relocation costs, $9,000 in income loss, $1,000 in rental income loss, and $6,000 in wage losses. Educational facilities would also sustain damage. The educational building damage is estimated at $2,404,000. The content that would be lost in educational buildings would be worth $8,300,000. Finally, the model predicts that religious or non-profit institutions would sustain $5,000 in building damage, and $39,000 in content loss.

Critical Facility Damage at the University of Illinois

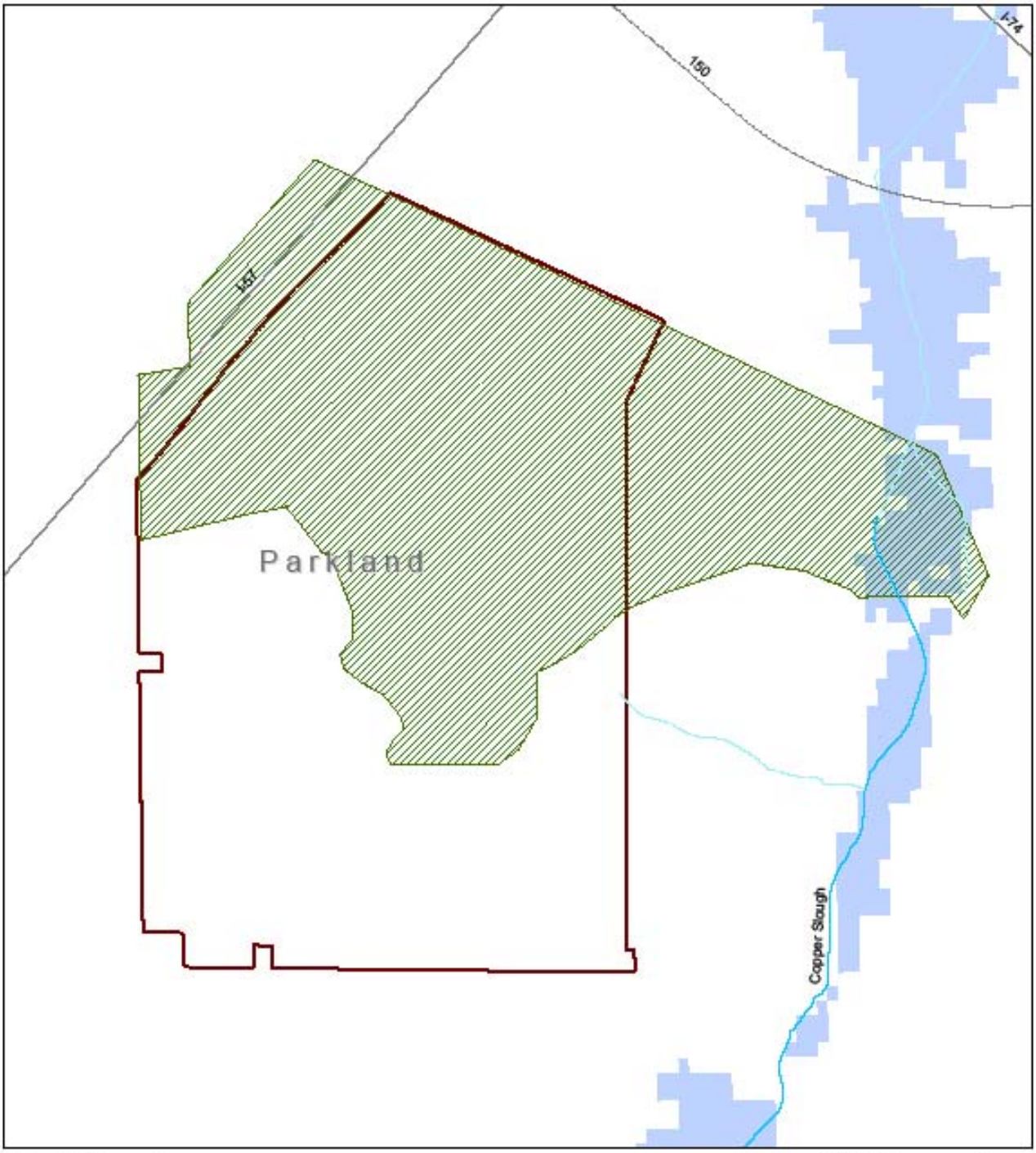
The model was not able to identify specific buildings that would be damaged. However, some of the damage that has been described above may include University of Illinois buildings, all of which are considered critical facilities.

Debris Generation at the University of Illinois

The model predicts that a total of 428 tons of debris will be generated as a result of the flood. Of this debris, 147 tons will be finishing materials, 206 tons will be structural materials, and 76 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 18 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs at the University of Illinois

HAZUS estimates that 89 people will be displaced as a result of flood damage, and that all of these individuals will seek temporary shelter in public shelters.



Parkland

Boundary Definition

Legend

- Census Blocks in Flood Plain
- Parkland Boundary
- 100 year flood plain
- Non Intermittent Stream
- Intermittent stream
- Interstates
- Federal hwy
- State Hwy

N

0 0.1 0.2 Miles

Date of Preparation: August 2008

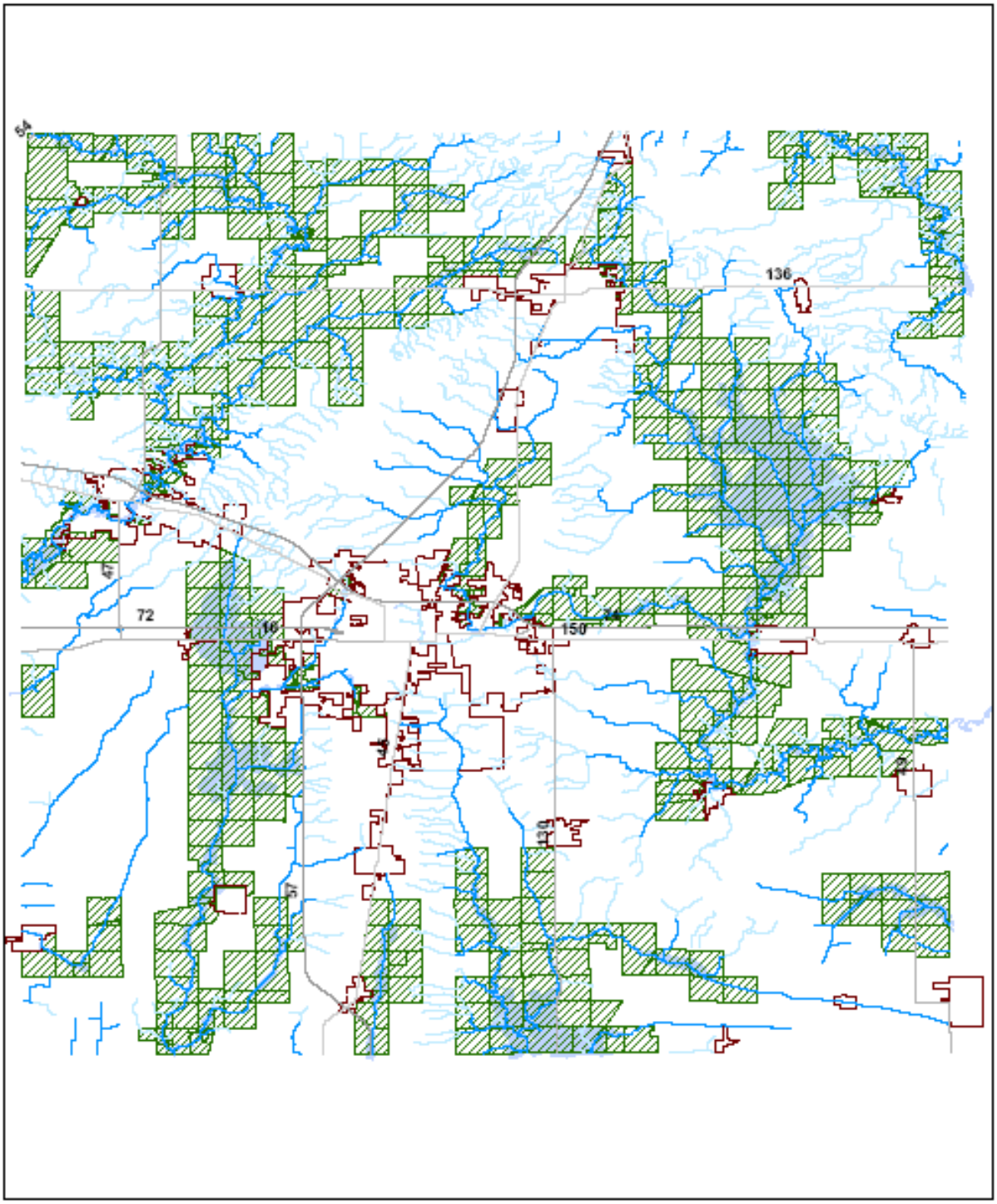
Parkland College

Building Damage at Parkland College
The model predicts minimal damage to structures in the Parkland College main campus area. The model does predict some damage in the census block shown above; however, the main campus falls outside the 100 year floodplain. It is unlikely that the damage predicted by the model includes Parkland buildings, but HAZUS has estimated potential damage at $2000 in residential building loss and $1000 in residential content loss. In addition there would be an estimated $2000 in agricultural building loss, $4000 in content loss, and $1000 in agricultural inventory loss.

Critical Facility Damage at Parkland College
The model does not predict any of Parkland Colleges' critical facilities will be damaged.

Debris Generation at Parkland College
The model predicts that 1.4 tons of debris will be generated. This debris could be removed with 1 truck.

Shelter Needs at Parkland College
HAZUS does not predict any displaced individuals.



Unincorporated Champaign County
Boundary Definition

Legend

- Census Blocks in Flood Plain
- Municipal Boundary
- 100 year flood plain
- Non Intermittent Streams
- Intermittent Streams
- Interstates
- StateHwys
- FedHwys

N

0 2 4 Miles

Date of Preparation: August 2008

Unincorporated Champaign County

Building Damage in Unincorporated Champaign County

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-22: Expected Unincorporated Champaign County Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	1	5	31	242	279
TOTAL	0	0	1	5	31	242	279

* Substantially damaged means greater than 50% of the building has been damaged.

Table A3-23: Expected Unincorporated Champaign County Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	**TOTAL**
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	9	9
Masonry	0	0	0	0	2	34	36
Steel	0	0	0	0	0	0	0
Wood	0	0	1	5	28	199	233
TOTAL	0	0	1	5	30	242	269

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Champaign resulting from the 100 year flood event.

Table A3-24: Unincorporated Champaign County Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	72,753	6,750	2,237	12,121	93,861
	Content	37,416	10,110	3,800	6,608	57,943
	Inventory	0	274	800	662	1,736
	Subtotal	110,169	17,134	6,837	19,391	153,540
Business Interruption						
	Income	0	57	0	25	82
	Relocation	68	8	0	0	76
	Rental Income	19	6	0	0	25
	Wage	3	59	0	200	262
	Subtotal	90	130	0	225	445
ALL	**Total**	**110,259**	**17,264**	**6,837**	**887**	**2,181**

Critical Facility Damage in Unincorporated Champaign County
The model does not predict damage to any of the critical facilities in unincorporated Champaign County.

Debris Generation in Unincorporated Champaign County
The model predicts that a total of 45,822 tons of debris will be generated as a result of the flood. Of this debris, 8,966 tons will be finishing materials, 21,571 tons will be structural materials, and 15,286 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1,019 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Unincorporated Champaign County
HAZUS estimates that 2,225 people will be displaced as a result of flood damage. Also estimated is that, of this group, 1,049 people will seek temporary shelter in public shelters.

HAZARD MITIGATION PLAN

City of Urbana

Approved by FEMA May, 2005
Adopted by Urbana City Council on June 20, 2005
(Ordinance No. 2005-06-087)

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Draft Plan Submitted to:

Urbana Project Impact Steering Committee
Urbana Comprehensive Plan Steering Committee
Richard Roths, Federal Emergency Management Agency, Region V
Ron Davis, Illinois Emergency Management Agency

Revised Plan Submitted to:

Urbana Plan Commission
Urbana City Council

Acknowledgements

Anna and Shuba
We would like to express sincere gratitude to our supervisor, Rob Olshansky, for his patient guidance and thorough reviews. It wouldn't have been possible to complete the plan without them.

We are thankful to the previous and current Project Impact Coordinators, Craig Grant and Libby Tyler, for encouraging us with their involvement and support. We are also grateful to all Project Impact Steering Committee members for their valuable input and Tim Ross (former City of Urbana Senior Planner) for his technical support.

We extend our heartfelt thanks to family members and friends for standing by us. Especially, I, Anna, would like to give my special thanks to my parents whose patient love enabled me to believe in myself and complete this work.

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Chapter I

INTRODUCTION

Chapter I. Introduction

1.1 Purpose and Goals

In the past, the City of Urbana has incurred losses from natural disasters. In an attempt to alleviate future losses, the City has decided to adopt standard mitigation measures. The Federal Emergency Management Agency (FEMA) defines "mitigation" as:

> *sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects*.

Standard mitigation measures help distinguish actions that have long-term impacts from those that are more closely associated with preparedness for, immediate response to, and short-term recovery from a specific event. Thus, mitigation does not mean controlling or stopping hazards. It means doing all that can be done to minimize the impact of hazards.

The mitigation measures outlined in this plan, aim to achieve the goal of protecting life and properties in the community from hazards. The mitigation strategies are designed at achieving the following objectives:

- Reduce risk, using actions that are cost-effective and feasible.
- Improve the community's information base regarding its vulnerability.
- Ensure that mitigation activities are compatible with the community's other development goals.
- Coordinate mitigation efforts of different agencies.

This plan is prepared on the following ten fundamental principles. They are based on the objectives of the National Mitigation Strategy developed by FEMA.

1. Mitigation measures insure long-term economic success for the community as a whole, rather than short-term benefit for special interests.
2. Mitigation measures for one natural hazard must be compatible with risk reduction measures for other natural hazards.
3. Mitigation measures must be evaluated to achieve the best mix for a given location.
4. Mitigation measures for natural hazards must be compatible with risk reduction measures for technological hazards and vice-versa.
5. All mitigation is local.
6. Emphasizing pro-active mitigation before emergency response can reduce disaster costs and the impacts of natural hazards; both pre-disaster (preventive) and post-disaster (corrective) mitigation is needed.
7. Hazard identification and risk assessment are the cornerstones of mitigation.
8. Building new federal-state-local partnerships and public-private partnerships is the most effective means of implementing measures to reduce the impacts of natural hazards.
9. Those who knowingly choose to assume greater risk must accept responsibility for that choice.

10. Mitigation measures for natural hazards must be compatible with the protection of natural and cultural resources.

This plan aims to achieve higher public safety by prioritizing mitigation projects and adopting measures that further protect citizens and businesses from the physical and economic effects of disasters.

1.2 Authority

Urbana was invited by FEMA in December 1998 to be the second Illinois community to join the program known as "Project Impact". It is one of 200 Project Impact communities throughout the country to have this designation. Project Impact is a national initiative that encourages communities to come together to assess their vulnerabilities to natural hazards and implement strategies to save lives and limit damage to buildings, utilities, and transportation systems before disasters occur. Urbana was chosen because of its vulnerability to floods, tornadoes, earthquakes, and ice storms. In addition, the City has exhibited strong public/private sector relationships and has developed public education programs. Urbana has already started taking actions to build a disaster resistant community.

Under the Project Impact memorandum of agreement signed in August 2000, representatives of local, state, and federal government, as well as business and community leaders, pledged to work together to make the city disaster resistant. The formulation of a hazard mitigation plan was part of the City's commitment in order to integrate its mitigation activities into a concerted effort.

A Draft of the Hazard Mitigation Plan was prepared by two graduate students in the Department of Urban and Regional Planning at the University of Illinois at Urbana-Champaign in June 2002, under the supervision of the Department and of the City of Urbana. This Draft was presented to the City's Project Impact Steering Committee and Comprehensive Plan Steering Committee. It was submitted to FEMA and to the Illinois Emergency Management Agency for review and comment. Planning staff at the City of Urbana completed the requested revisions in 2003 and submitted it for review and approval by the Urbana Plan Commission and City Council in late 2004.

1.3 Planning Approach

This plan follows the standard 10-step process based on the guidance and requirements of FEMA. This process is summarized in *Figure 1.1*.

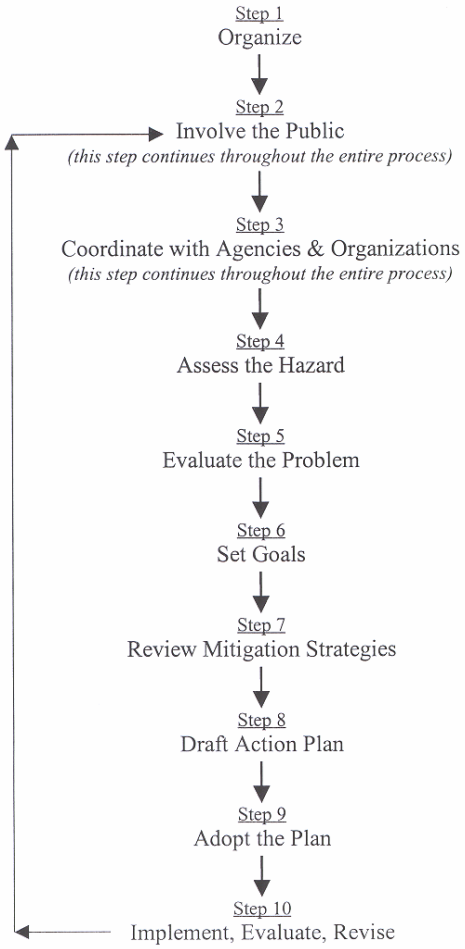


Figure 1.1 Mitigation Planning Process

Organizing for the plan involved designating responsibilities and determining the timeline and the funding for the plan. The City planning staff and Project Impact coordinator developed a sub-contract with the University of Illinois Department of Urban and Regional Planning to conduct a student project that would develop a mitigation plan for the City. Two Master's students, supervised by a faculty member from the UIUC Planning Department, were assigned to this project. They reported their work to the Project Impact Steering Committee on a monthly basis. The City requested that the Plan be prepared as a stand-alone element of the City's Comprehensive Plan. This involved presentation and review by the City's Comprehensive Plan Steering Committee.

Public involvement was a continuous part of the planning process. At every major stage of the process, public input was received in the form of expert opinion from members of the Project Impact Steering Committee. This committee was formed as a part of the City's designation by FEMA as a "Project Impact Community". The Project Impact Steering Committee was composed of representatives of the community, including residents, business owners, city

officials (fire department, community development), City utility providers, and organizations related to emergency management at the county and national level (*Figure 1.2*). The Committee was deactivated in 2003, following completion of Project Impact related projects in Urbana. Reactivation as a broader-based group with greater representation by the City of Champaign is anticipated in the future.

Hazard assessment was done with the help of information from the City, Emergency Services and Disaster Agency (ESDA), United States Geological Survey (USGS), and other sources. Documentation of past disasters, damages, and current mitigation activities was also collected from these agencies. Information on the nature of hazards and vulnerability was collected mainly from existing FEMA literature and Internet sources.

These same sources were also used to determine the range of mitigation strategies suitable for Urbana. Costs, benefits, and feasibility were then identified for each strategy with the help of the Project Impact Coordinator (Chapter IV, *Figures 4.1-4.4*). Priorities for each of these strategies were developed during two Project Impact Steering Committee discussion sessions.

Action items for implementation were formed from the general recommendations of the mitigation strategies. Each action item identifies the appropriate agencies and suggested time frames. Following review by the Project Impact and Comprehensive Plan Steering Committees, the Draft Hazard Mitigation Plan will be presented at a public hearing of the Urbana Plan Commission. It will then be presented for adoption by the City Council of the City of Urbana as an element of the City's Comprehensive Plan. Adoption of the Hazard Mitigation Plan will help to fulfill the goals set forth in the Disaster Mitigation Act of 2000.

1.4 Disaster Mitigation Act, 2000

On October 30, 2000, President Bill Clinton signed into law the Disaster Mitigation Act of 2000 that amended the Robert T. Stafford Disaster Relief Act of 1988. Among other things, the new legislation reinforces the importance of pre-disaster infrastructure mitigation planning to reduce disaster losses nationwide, and is aimed primarily at controlling and streamlining the administration of federal disaster relief and programs to promote mitigation activities.

FEMA published an interim final rule (*Appendix A*) in the Federal Register on February 26, 2002, implementing the hazard mitigation planning sections of the Disaster Mitigation Act of 2000. These provisions provide new federal requirements for mitigation planning and offer a significant opportunity to reduce disaster losses through mitigation planning at both the State and local level. The rule addresses State mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. The City of Urbana has greater opportunities for receiving funding by having a hazard mitigation plan that meets the requirements in the interim final rule.

Figure 1.2 Urbana Project Impact Steering Committee

	Affiliation
Barbara Payne	Co-Chair, American Red Cross
Don Schlorff	Co-Chair, Busey Bank
Craig Grant	Coordinator, City of Urbana
Libby Tyler	Coordinator, City of Urbana
Debbie Albin	Illinois Power
Van Anderson	University of Illinois
Bob Bone	State Farm Insurance
Elawrence Davis	Housing Authority, Champaign County
Otta Dossett	Urbana School District 116
Tom Exton	Illinois-American Water Company
Rosemary Foster	Housing Authority
Bill Gray	Urbana Public Works
Charles Heflin	Edge-Scott Fire Department
Vicki Jarboe	Mid-America Earthquake Center
Ted Jeurissen	Champaign County Regional Planning Commission
Kate Johnston	American Red Cross
Bill Keller	Champaign County ESDA
Rick Levine	SuperValu
Robert Mann	Carle Foundation Hospital
Sandra Menke	Mid-America Earthquake Center
Rex Mundt	Urbana Fire Department
John Nichols	Mid-America Earthquake Center
Dennis Ohnstad	Riley Homes
Joe Perry	Flex-N-Gate
Joe Potts	Urbana Park District
Scott Rose	Champaign County Regional Planning Commission
William Volk	C-U Mass Transit
Randall White	Lowe's

Chapter II

COMMUNITY BACKGROUND

Chapter II. Community Background

2.1 GEOGRAPHICAL FEATURES

2.1.1 Landscape

The City of Urbana and its outlying Extra Territorial Jurisdiction (ETJ), with the exception of the minor slopes along the Yankee Ridge Moraine and the rolling countryside along the Saline Branch, is very flat. The average elevation is 730 feet above sea level according to the Illinois State Water Survey. The majority of the undeveloped and cultivated area is classified as prime farmland. The area's flat landscape allows straight-line winds to move at high speeds, making Urbana prone to wind hazards.

2.1.2 Waterways

The major waterways are the Saline Branch Drainage Ditch, Boneyard Creek, and McCullough Creek. The Saline Branch crosses the area north of Interstate 74. Boneyard Creek runs downstream through the heart of the community touching residential, commercial, industrial properties and land uses. McCullough Creek is the smallest waterway in the community and is concentrated within mainly agricultural area in southwest Urbana. A portion of the Embarrass River Basin is located in the southwestern portion of the one-and-one-half mile ETJ. Developed areas of the community that fall in the floodplain of these waterways are thus exposed to floods.

2.1.3 Hydrology

The flat landscape and poorly drained soil types that characterize the area do not facilitate proper surface drainage and puts the City at a higher risk of flooding. The hydrologic network within and around the City of Urbana consists of the several river basins mentioned above, including the Saline Drainage Ditch and Boneyard and McCullough Creeks.

2.1.4 Soil

Urbana soils are mainly upland prairie of the Drummer-Flanagan (Boneyard Basin), Drummer-Xenia (Saline Branch), and Dana-Parr-Drummer (McCullough Basin) groups. The glacial drifts consist of a heterogeneous mixture of clay, silt, sand, and gravel, with a thickness of 250 feet near Urbana. Soils found near the Saline Drainage Ditch basin and other water resources are considered low in crop production potential and severe in potential building site limitations. Maps by the Association of Central United States Earthquake Consortium (CUSEC) State Geologists illustrate that Urbana soils (upper 50 feet) have a high potential for amplifying earthquake ground motions or liquefaction.

2.1.5 Precipitation

The average yearly precipitation is 35.9 inches. The temperature ranges from an average of 26^{o} Fahrenheit in January to 75^{o} in July. The land surface of the area has a level or gently rolling topography, which again, generally provides inadequate drainage for storm runoff.

2.2 LAND USE PATTERN

As seen in *Figure 2.1*, Urbana can be characterized as a predominantly residential community with many neighborhoods of single-family and multi-family housing. As a highly urbanized community, Urbana has a large number of people and properties that are exposed to natural hazards. *Figures 2.2 and 2.3* show the City's 2003 Existing Land Use and Future Land Use maps. These maps can be used to help identify vulnerable properties, as well as what land use types are planned for the future.

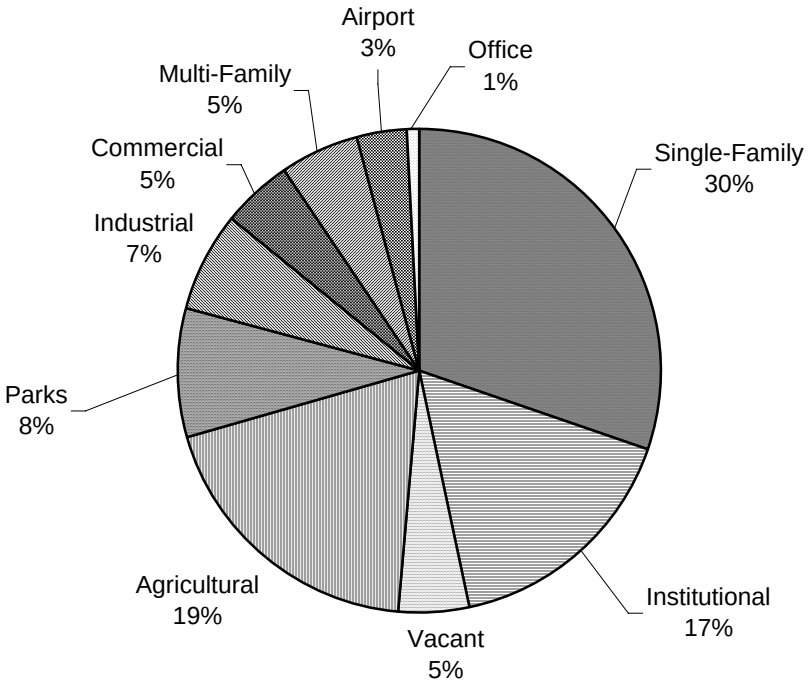


Figure 2.1 Distribution of Land Uses, City of Urbana, 2001

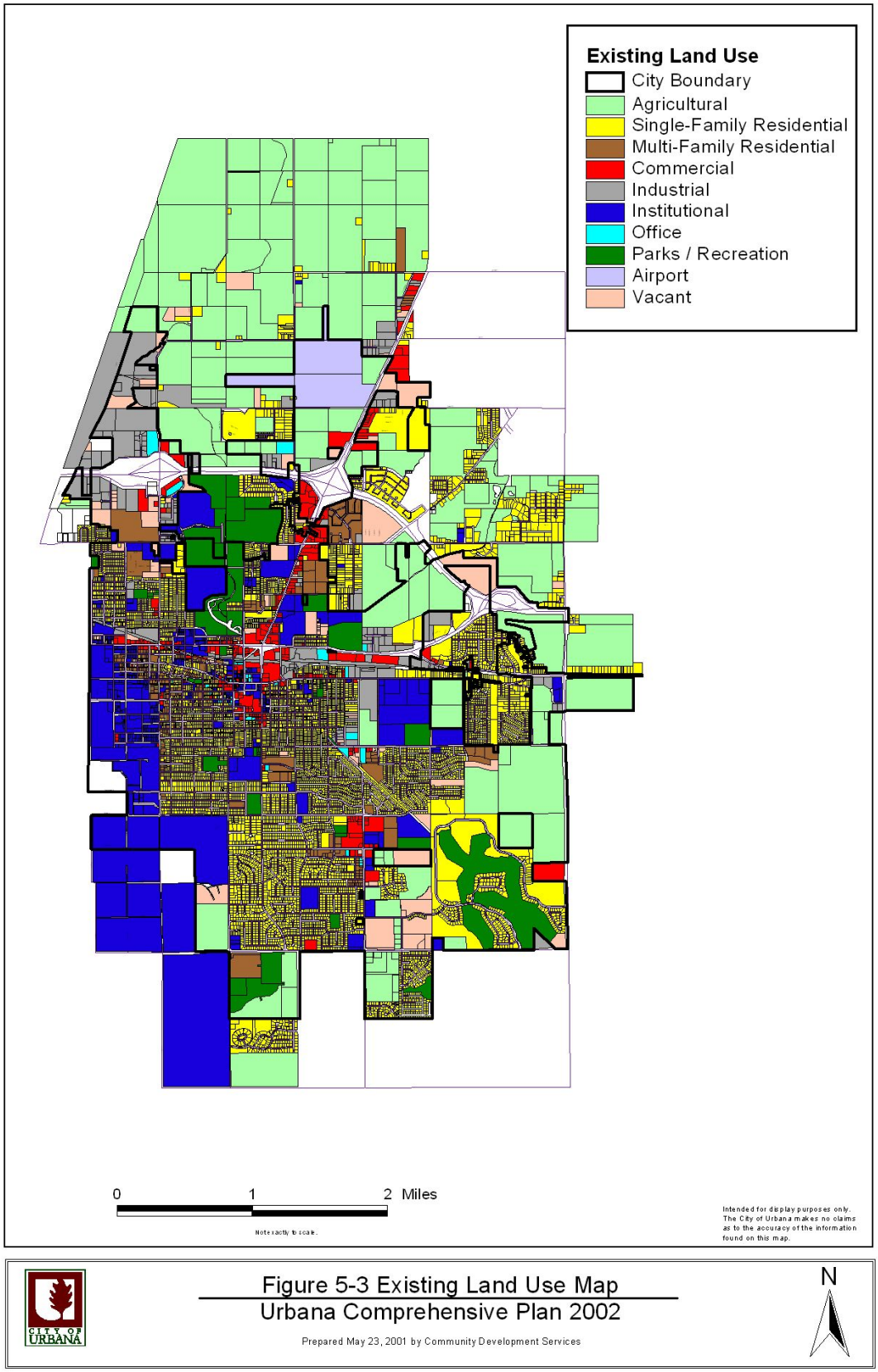


Figure 2.2 City of Urbana Land Use Map

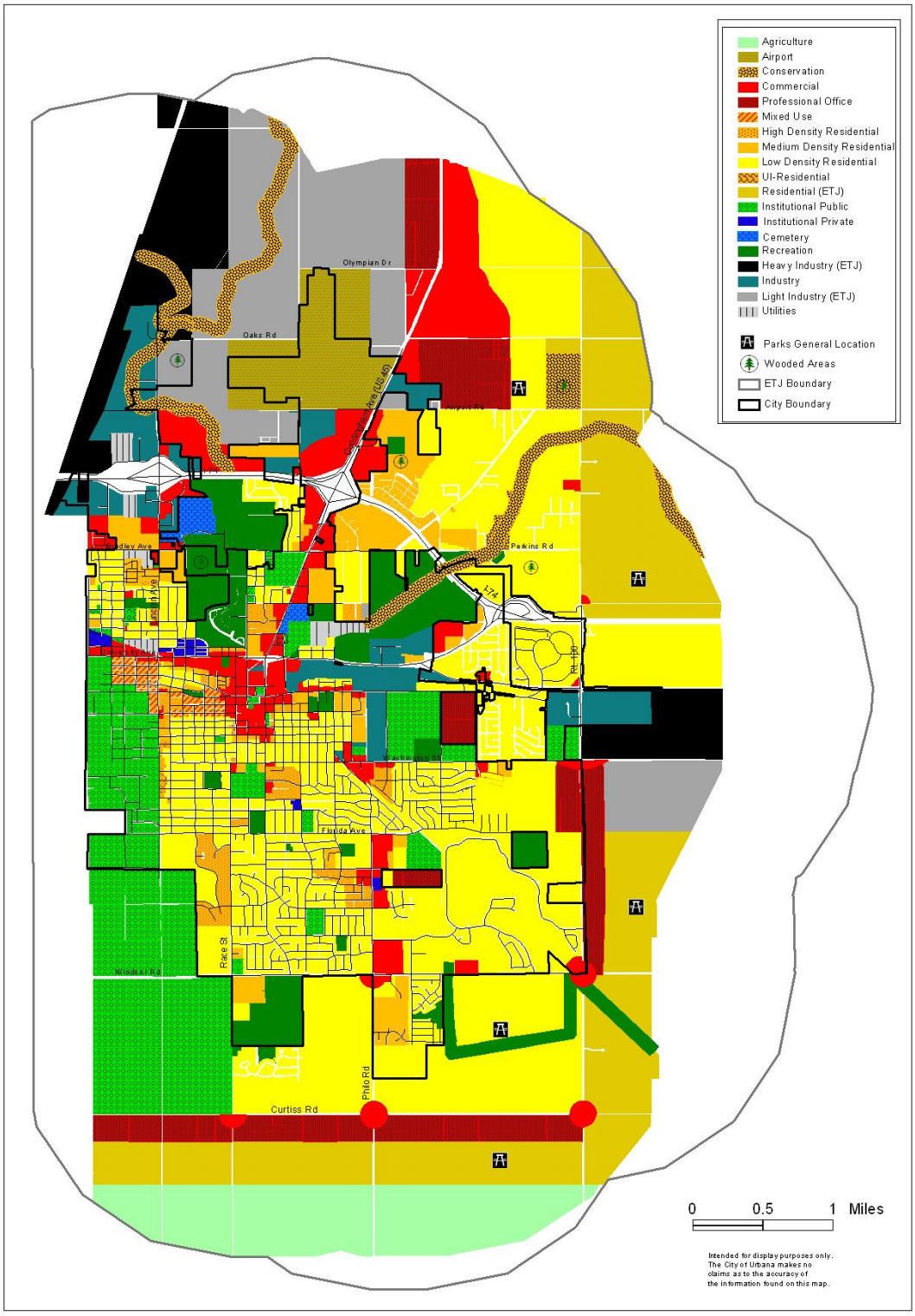


Figure 2-1 Future Land Use Plan Map
Urbana Comprehensive Plan 2002

Prepared April 10, 2002 by Community Development Services

N

2.3 CRITICAL COMMUNITY SERVICES

Certain parts of the community require special protection from hazards. These are called critical community services, as identified by the City, and are of the following kinds:

- Those services that can create secondary disasters (e.g. chemical plants, gas stations, storage of toxic or flammable materials).

- Transportation and utility networks (e.g. roads, airport, electric power, water supply, sewage treatment).
- Facilities that are important to the community as a whole (e.g. important businesses, schools).
- Emergency services (e.g. fire services, police services, hospitals).

2.3.1 Transportation

Interstate access to Urbana is provided by Interstate 74, which extends east to Danville and Indianapolis and west to Bloomington/Normal, Peoria, and the Quad Cities. Interstate 74 interchanges with Interstates 72 and 57 five miles west of Urbana, providing access to Chicago, Springfield, southern Illinois, and Missouri. The Champaign-Urbana Mass Transit District (C-U MTD) operates five types of transit service in the Urbana area, including fixed route bus service, demand response service, paratransit, subsidized taxis, and charter service. Three railroad lines operated by Norfolk Southern, Canadian National, and Amtrak serve the Urbana-Champaign area. Two airports provide air service for Urbana-Champaign. As of 2001, there were 4.67 miles of roadway within Urbana's 100-year floodplain that may be vulnerable to being closed due to flooding, as well as twenty-six bridges and culverts.

2.3.2 Utilities

There are approximately 40 utility facilities in Urbana. The Urbana-Champaign Sanitary District provides sanitary sewer service. The District maintains two treatment facilities, one in Urbana and the other in Champaign. The Northeast Plant, is located in Urbana along east University Avenue. A private company, Illinois-American Water, provides municipal water treatment and distribution. They have a treatment facility located on Lincoln Avenue. Also at this location are large capacity Illinois-American wells that are used to supply Urbana and Champaign with their municipal water supply. Illinois Power, a private utility company that is regulated by the Illinois Commerce Commission, provides gas and electricity. Illinois Power has a number of substations and other facilities and roughly fifty miles of electrical distribution lines located in Urbana. Other utilities including telephone, cable television, internet access, cellular telephone, and fiber optic lines are provided by a number of private carriers. Most of these utilities have overhead lines, which exposes them to wind and ice storm hazards.

2.3.3 Community Facilities

Urbana has six neighborhood elementary schools, one middle school, one high school, an early childhood center, and a special education program. There are ten public buildings in the city, including the City Hall, police and fire stations, and County Courthouse. The elementary schools are located close to residential areas and the high school and middle school are centrally located near downtown Urbana. Schools not only require protection, but can also serve as shelters in times of emergency.

Urbana has six different business neighborhoods: Downtown, North Cunningham, North Lincoln, East Urbana, Southeast Urbana, and the University of Illinois/Medical business neighborhood. In 2001, an estimated 2,520 businesses were considered at risk to damage from natural hazards. This does not include public buildings, schools, or hospitals.

The downtown business neighborhood consists of a nine-block area in the central business district. It includes the Champaign County Courthouse, the Federal District Courthouse, City of Urbana offices, Busey Bank headquarters, and many professional offices, as well as many unique small businesses. The County Courthouse and the Urbana Free Library are some of the community's oldest landmarks. Since many of the top ten private and public employers have their offices in this area, it is one of the most valuable assets to the community and thus needs special protection from hazards.

2.3.4 Emergency Services

Fire and rescue services are available from the City of Urbana Fire and Rescue Services Department and five neighboring township volunteer fire departments. The city is served by four fire stations.

Metropolitan Computer Aided Dispatch (METCAD) is a consolidated dispatch center located on east Main Street in Urbana. It answers emergency 9-1-1 calls for all of Champaign County. It also provides direct dispatch service for law enforcement agencies and fire agencies throughout the county. It has the facilities to provide for continuous operation through the most adverse of conditions.

Champaign County Emergency Services Disaster Agency (ESDA) and the City of Urbana operate Emergency Operations Centers (EOC) by which they respond to emergency situations as either a coordinating agency or a support agency. ESDA has deployed a network of Storm Spotters who provide advance warning of severe weather. EOC staff monitors the weather radar and the national Weather Service weather wire. They disseminate the information to ESDA storm spotters, amateur radio storm spotters, and other public safety agencies.

Medical services are provided by Carle Foundation Hospital and Provena Covenant Medical Center. Carle Clinic Association works in collaboration with Carle Foundation hospital and has a network of clinics serving east central Illinois. Christie Clinic Association is a multi-specialty medical group practice based in Champaign with five clinics in the area.

2.4 DEVELOPMENT TRENDS

2.4.1 Population

The 2000 Census reported a population of 37,362 for the City of Urbana. This was a gain of 1,018 persons over the 1990 count of 36,344, for a 2.8% increase in population over the last decade. Projected population for the City of Urbana is expected to steadily increase over the next three decades to 45,646 persons, according to projections generated by the C-U 2030 Plan (*Figure 2.4*). The population has grown steadily since 1970 and this trend is expected to continue in coming years. This growing population adds to the number of persons exposed to hazards in Urbana.

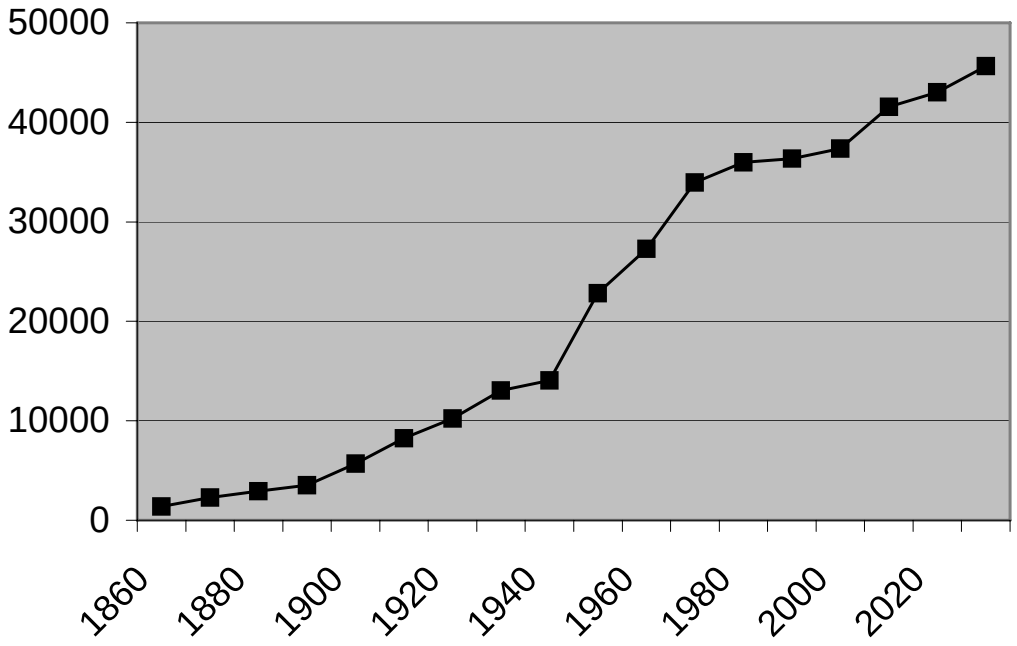


Figure 2.4 Population by Decade and Projected Population, 1860-2030

2.4.2 Housing

Housing units increased by 9% from 1990 to 2000 (13,982 units to 15,243 units) and are projected to increase an additional 19% to 18,161 units by 2030. Eight new housing subdivisions have been recently or are currently being constructed. These include Stone Creek, Eagle Ridge, South Ridge, Beringer Commons, Lincolnwood, Savannah Green, Landis Farms, and Fairway Estates. Major existing multi-family developments include Town and Country Apartment, Amber Pointe Apartments, Melrose Apartments, University Commons, and University Housing at Orchard Downs. In 2001, 8,213 homes were identified as representing buildings that may experience damage from windstorms, earthquakes, ice storms, or floods.

In 2002, the City's Building Safety Division issued 181 permits for a total of 240 new residential units, including single-family, multi-family, and duplexes (*Figure 2.5*). In the same year, one new recreational and eleven new business permits were also granted. In 2003, a total of 167 permits were issued for 159 new single-family, 164 multi-family, and 6 duplex units. Also in 2003, there were three new industrial permits, six new commercial permits, and one new recreational permit. Similar figures are projected for 2004. New development, depending on the quality of its design, construction, and location can increase the number of Urbana residents exposed to natural hazards.

Figure 2.5 New Construction Permits in Urbana

Construction Type	Year 2002	Year 2003
Residential	181	167
Industrial	0	3
Institutional	0	0
Business	11	6
Recreational	1	1

Chapter III

HAZARD ASSESSMENT

Chapter III. Hazard Assessment

Historically, Urbana has been exposed to natural hazards, including tornadoes, windstorms, ice storms, floods, and earthquakes. Other hazards such as hurricanes, tsunamis, tidal waves, wild fires, volcanic eruptions, and landslides are not of concern for the City, because of its relatively flat topography and geographical location within the Midwest. Hazards were identified as threats to Urbana using informational sources, including historical data, newspapers, existing plans and reports, expert interviews, and United States Geological Survey (USGS) data. In this chapter, each of these hazards has been addressed under the following categories: the nature of the hazard, history, vulnerability assessment, and current mitigation measures.

Hazard assessment was done on the basis of historical records of previous hazards, City documents and publications, and interviews with key members of the Steering Committee. This involves evaluating the extent to which the community is exposed and ascertaining the risk due to these hazards. Information on the characteristics of the population at risk (age, ethnicity, income, and relevant health characteristics) and structures at risk (housing and businesses) can be used in developing a "risk reduction yardstick" to gauge the progress of future mitigation tools and techniques.

Three levels of hazard assessment can be identified from the various literatures on hazard mitigation planning. They are as follows:

1. **Hazard Identification** determines the extent and boundaries of the hazard, the nature and magnitude of the hazard, the probability of occurrence for each hazard and a historical context. The historical context will include what hazards have occurred in the community and which areas they affected.

2. **Vulnerability Assessment** estimates the number of people and the property exposed to the hazard and identifies areas or structures that are relatively more susceptible to the hazard. The potential damage to the community is determined by these factors.

3. **Risk Analysis/Risk Assessment** is the calculation of risk, i.e. the potential damage associated with the hazard defined in terms of expected probability and frequency, exposure, and consequences.

Risk analysis is the most sophisticated, costly, and data intensive level of hazard assessment, and it also provides the greatest degree of precision. Risk analysis is most appropriate for moderate to high-risk areas which are exposed to a range of natural hazards and are experiencing rapid growth and development. This plan contains hazard identification and vulnerability assessment for all hazards and results of the risk analysis for seismic risk in Urbana. *Figure 3.1* is a chart that summarizes each hazard assessment made in this chapter. It also provides an estimate of the number of events that may occur in Urbana in the next thirty years.

Figure 3.1 Summary of Hazard Assessment

Hazard	Damage from Latest Major Event	Vulnerability	High Risk Concerns	Estimated Number of Events in the Next 30 Years
Ice Storm	$768,000 (excluding private costs) (1990)	Whole City	Conflict between trees and overhead power lines	1 to 2
Wind Storm/ Tornado	$270,000 (excluding private costs) and 4,700 man-hours (1996)	Whole City	Mobile homes, multifamily apartment buildings	Every year (wind storm) 0 to 1 (moderate tornado)
Flood	$771,700 (including private and public costs) (1990)	Floodplain (approximately 330 properties)	Floodplain	0 to 3 events similar to 1990. Major events are unlikely.
Earthquake	Minor damages (1987)	Whole City	URM buildings	0 to 2 m5 events. Major events are unlikely.

3.1 TORNADOES AND WIND STORMS

3.1.1 Nature of Tornadoes

Tornadoes are produced during severe thunderstorms, which are created near the junction between warm, moist air and cold, dry air. Tornadoes derive their energy from the heat contained in warm, moist air masses. A tornado path is generally less than 0.6 miles (1km.) wide. The length of the path ranges from a few hundred yards to dozens of miles. A tornado will rarely last longer than thirty minutes.

The combination of conditions that cause tornadoes are common across the central and southern U.S. in early spring, especially in April and May, but they can occur at anytime during the year. Tornadoes have been recorded as lifting and moving objects weighing more then 300 tons up to 30 feet. They can also lift homes off of their foundations. They collect an incredible amount of debris, which can whirl out of their vortices at high velocities, creating ‘missiles’. Tornadoes are

usually accompanied by heavy rain. They can cause large amounts of property damage, injury, and death.

The Fujita tornado scale is used to measure the severity of tornado damage. The Fujita scale assigns numerical values based on wind speeds and categorizes tornadoes from zero to five. *Figure 3.2* shows the Fujita scale values, intensity phrase, wind speeds, description of damages, and the national average number of tornadoes per year (1953-1989).

While violent tornadoes are few in number, they cause a very high percentage of tornado-related deaths. The Tornado Project, a small Vermont company that gathers, compiles, and makes tornado information available, has analyzed data prior to 1950 and found that the percentage of deaths from violent tornadoes was even greater in the past. This is because the death tolls prior to the introduction of the forecasting/awareness programs were enormous. In more recent times, no single tornado has killed more than fifty people since 1971, because of these forecasting and awareness improvements.

3.1.2 Tornado History

The Illinois tornado season is mainly from mid-March through June, although tornadoes can occur during any month of any season. Most of the deadly tornadoes have occurred in March, April, and May. Tornadoes typically move from southwest to northeast at 30 to 40 mph, but some can move at 60 to 70 mph, especially in the spring. Illinois' tornadoes are most often small and short-lived with winds of around 100 mph or less. A few are strong tornadoes with winds of 100 to 200 mph. Larger, long-track tornadoes with devastating winds of 200 to 300 mph are extremely rare, but they do occur in Illinois. On average number there are thirty tornadoes per year in Illinois. The most tornadoes in a month (since 1950) were fifty-three in May 1995 and forty in April 1996. In 2000, twenty-three out of the twenty-four central Illinois tornadoes were F0 and F1 intensity (in the weak, short-lived, short-path category).

There were thirty-six tornadoes in Champaign County between 1950 and 1995. *Figure 3.3* shows that while tornadoes in Champaign County causing significant damage are rare, weak tornadoes and windstorms occur relatively frequently. High winds in April 1962 caused two deaths and damages costing over one million dollars. The tornado in April 1996 caused one death in Ogden.

A tornado event near Urbana in August 1967 was reported in the local newspapers to have caused damages of around $30,000. At least four mobile homes were destroyed in the storm when they were ripped off their foundations, landing upside down or at angles, leaning against the mobile home next to them. Other high-speed wind events occurred in 1988, 1989, 1992, 1996, 1998, and 2001. *Figure 3.4* is a picture of a cold air funnel over Urbana.

Figure 3.2 Fujita Tornado Scale

F Scale	Intensity Phrase	Wind Speed	Type of Damage Done	National Average per Year (1953-1989)
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages signboards.	218(29%)
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.	301(40%)
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	175(23%)
F3	Severe tornado	158-206 mph	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	43(6%)
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	10(1%)
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.	1(0.002%)

Source: Tornado Project (http://www.tornadoproject.com) and Clay County Mitigation Plan, Arkansas (http://quake.ualr.edu/HazardMitigation/claymitg-plan/Tornado-Thunder.htm)

Figure 3.3 Tornadoes in Champaign County (1950-1995)

Fujita Scale	Number of Tornadoes
F0	12
F1	11
F2	8
F3	4
F4	1
F5	0

Source: Tornado Project http://www.tornadoproject.com/alltorns/iltorn1.htm#C)

Figure 3.4 Cold Air Funnel over Urbana

The tornado in 1996 was a major event. On April 19, 1996, at approximately 8:30 p.m., a tornado measuring F2 or F3 on the Fujita scale touched down in south Urbana and damaged 112 homes and businesses (*Figure 3.5*). Half of the 112 homes and businesses hit by the tornado had substantial damage. Twenty-four of the homes were completely destroyed and thirty were deemed unfit for residents to live in. This tornado caused one death in Ogden and minor injuries (ten injuries from two touch downs, one in Urbana and another in Ogden). As a result, Champaign County was proclaimed a Federal Disaster Area. *Figure 3.6* is a parcel map that highlights which properties were damaged by the April 19 tornado. *Figures 3.7-3.9* show examples of major, medium, and minor damages.

Figure 3.5 Damages from the Tornado in April 1996, Urbana

	Minor	Moderate	Major
Residential Structures	54	30	23
Commercial Structures	4	1	0
Total	58	31	23

Source: City of Urbana

Figure 3.6 Tornado Damage, 1996

Figure 3.7 Typical Major Tornado Damage, 1996, Urbana

Figure 3.8 Typical Medium Tornado Damage, 1996, Urbana

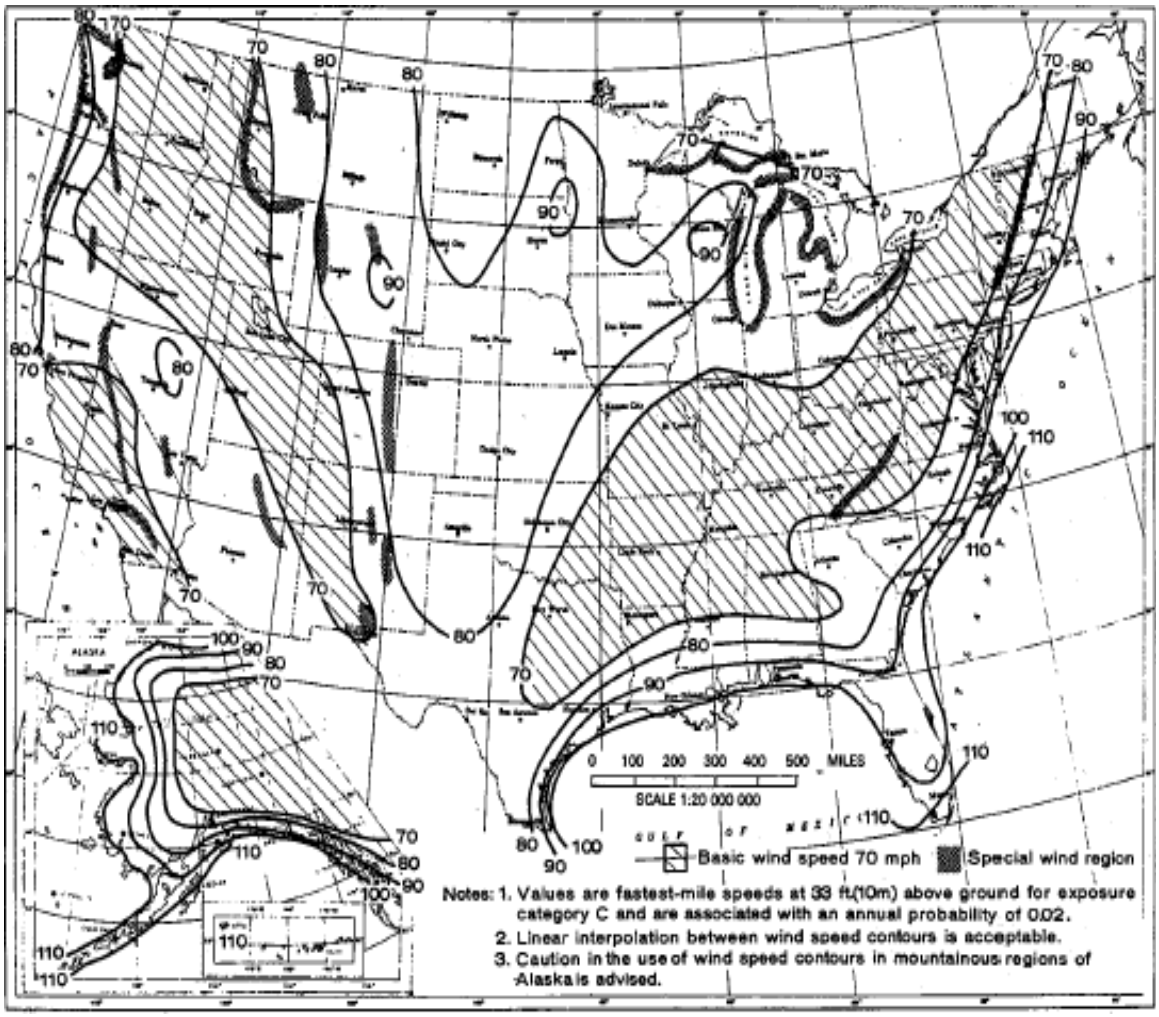
Figure 3.9 Typical Minor Tornado Damage 1996, Urbana

In the hardest hit areas of east Urbana and Ogden, work crews and emergency service personnel from the City and the Emergency Services Disaster Agency (ESDA) worked to restore order. Costs to the City of Urbana from the tornado of April 1996 amounted to approximately $230,000. If the contribution of resources from other governmental agencies that provided mutual aid during the event is included, the costs increased to nearly $270,000, of which approximately $170,000 was reimbursed by FEMA. The initial response and subsequent clean up effort required more than 4,700 man-hours. This total does not include any loss to private homes or businesses. In an attempt to quickly and efficiently allow for the repair of private properties that were damaged by the tornado, Urbana waived the requirement that building permits be purchased. As a result, subsequent documentation that is typically recorded and archived from those permits, including costs, was not kept.

Other high wind events occurred in 1998 and 2001. The April 1998 event resulted in power outages for several hours. The greatest damage was in areas with large trees, primarily older neighborhoods. In October 2001, strong winds destroyed a duplex, damaged about ten homes in the Champaign-Urbana area, and smashed a fabricated plant.

3.1.3 Tornado Vulnerability Assessment

The wind speed map for the United States (*Figure 3.10*) shows that Urbana falls in the area where the fastest wind speeds are 70 mph. This means that Champaign County has experienced or is expected to experience a wind speed greater than 70 mph on the average of once in fifty years. The probability of the wind speed exceeding 70 mph in Champaign County within a given year is 2%, while the probability that this wind speed will be equaled or exceeded in fifty years is 64%.



Source: ANSI/ASCE 7-93, the American Society of Civil Engineers

Figure 3.10 Basic Wind Speed Map, United States

Though the whole city is exposed to tornado damage, certain areas are most vulnerable (*Figure 3.11*). Factors that affect vulnerability to tornadoes include the following:

1) **Construction Type:** Studies[1] on previous tornado events in the states of Florida, Alabama, Arkansas and Ohio show that tornadoes result in fatalities in manufactured homes. The 'Tornado Safety Tips Brochure' from FEMA's online library says, "Mobile homes are particularly vulnerable. A mobile home can overturn very easily even if precautions have been taken to tie down the unit." Thus, people living in manufactured or mobile homes are most exposed to damage from tornadoes. Even if anchored, mobile homes do not withstand high winds. Structures made of unreinforced masonry and wood frame are typically vulnerable as well. Urbana has four mobile home parks.
2) **High Population Density:** The large apartment complexes located in Urbana are vulnerable due to their high concentration of residents.

[1] *University of Colorado/ Natural Hazards Observer (www.colorado.edu/hazards)*

3) **Condition of Inhabitants:** Hospitals and nursing homes are more vulnerable because of the relative immobility of the inhabitants.

3.1.4. Current Tornado Mitigation Activities

The City has prepared a video to demonstrate techniques that have been proven effective in preventing wind damage caused by separation at the structural joints of homes. The video has been shown on Urbana Public Access TV. More than 9,500 copies of this video have been distributed throughout the U.S. and abroad. Copies of the informative video can be obtained from the City's Building Safety Division and from FEMA, as supplies are available.

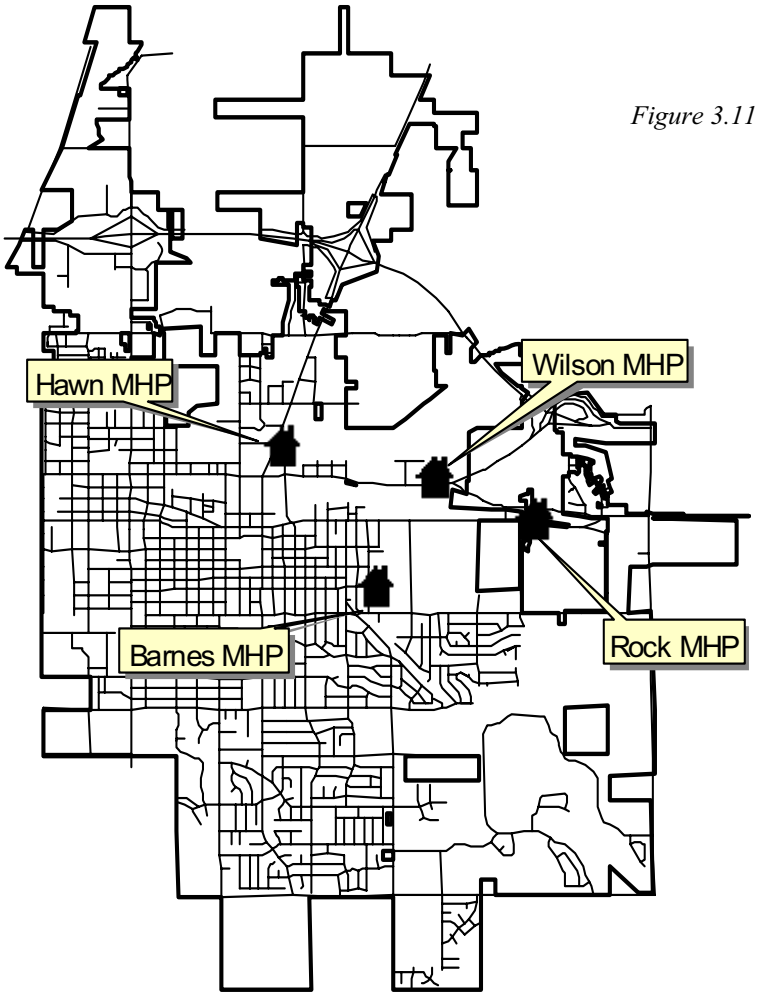


Figure 3.11 Vulnerable Areas

The City has an In-Residence Storm Shelter Demonstration Project, which is aimed at increasing the local awareness of the community's risks and assisting those community members who seek to enhance their disaster resistance. The distribution of information regarding methods to build in-residence storm shelters will offer many homeowners new opportunities to protect their families from the devastation of tornadoes and severe windstorms while remaining in their current homes. This could be expected to reduce the number of injuries and loss of life during such events.

The City has estimated costs for upgrading the construction of two typical homes to make them wind resistant. To create a 90 mph wind speed resistant design, an upgrade would cost about 7% of the total cost of a small, one story home with modest finishes and a simple floor plan. For a bigger house with a more complex plan and a higher level of upgrade, an upgrade would cost 3% of the total cost of the building.

The City presently follows the 1990 BOCA code and is in the process of updating it to the International Building Code, 2003. This code has higher standards for wind and seismic resistance.

Installation of underground electrical services would make individual residences less susceptible to a loss of electrical power during an ice or windstorm. This is especially true when local utility companies help augment such efforts. Companies can trim trees from their utility easements to reduce the risk of damage during such storms. In 2001, the City of Urbana Public Works Department prepared the "Overhead to Underground Utility Conversion" report that studied the feasibility of burying utility lines. Alternative One, which includes a full conversion of all utilities, estimates costs at a minimum of $7,000 per household. Alternative Two, which includes the conversion of the electrical facilities while maintaining the overhead telephone and cable television utilities, would cost households at least $3,800.

Since the costs are very high, the City cannot afford to bury all utility lines, unless additional funding sources become available. Using Project Impact Funds, the City has provided a cost-sharing program with individual property owners to encourage them to bury power lines from the nearest pole to their homes. The City's subdivision ordinance requires that developers bury utilities at new construction sites. Redevelopment projects also have the opportunity to bury lines.

The 'Masters of Disaster' program in Urbana schools is being implemented with the help of many organizations, such as the City of Urbana, the Urbana School District, the Illini Prairie Chapter of the American Red Cross, and the Mid-America Earthquake Center. The main objective of this program is to seek opportunities to develop a broad-based, community-wide approach to hazard mitigation that is proactive in its focus. The program performs the following activities:

1) Review information / resources available from FEMA, IEMA, the American Red Cross and other Project Impact communities for use in the program.
2) Make presentations to the local elementary schools.

3) Provide each interested school with a set of mitigation education tools.
4) Make additional public outreach presentations with the “Masters of Disaster” curriculum as opportunities arise.

3.2. WINTER STORMS / ICE STORMS

3.2.1. Nature of the Storms

As the sun gradually lowers in the sky in the Northern Hemisphere during the fall, cold arctic and polar air masses intrude farther and farther south into the United States. Disturbances forming along the boundary between the cold polar air and the relatively warm, tropical air sometimes turn into winter storms. These are usually large, intense low-pressure systems that may cover tens of thousands of square miles. Illinois' location in the Midwest places it in the path of many of these storms. When conditions are right, these storms can strike Illinois hard, leaving snow and ice over all or parts of the state. Severe winter storms in Illinois produce more total damage than any other form of short-term severe weather, including tornadoes, lightning, and hail.

Central Illinois has the distinction of being in the nation's primary area for severe freezing rain or ice storms. However, any part of the state is apt to have a severe snowstorm or ice storm. Illinois experiences an average of five severe winter storms during the period from November to April. These storms may produce heavy snow, ice (glaze), and/or a combination of both. Although the average is five per winter, as many as eighteen severe storms have occurred in one winter (1977-1978) and as few as two in another (1921-1922). The month of January experiences the greatest number of severe winter storms, although the number of December, February, and March storms follows closely behind.

For the State of Illinois, a storm is considered severe if it produces a snowfall of six inches or more in forty-eight hours or less somewhere in the state. One inch of snow may result in minor travel delays, while ten inches can close down a city. However, the severity of a particular snowstorm is not measured solely by the amount of snow that falls, but also by the temperature at which it falls and whether or not it is accompanied by high winds.

A typical severe storm in Illinois (i.e., six inches or more of snowfall) that occurs when the temperature is near freezing will result in considerable inconvenience and disruption of daily activities, but can normally be cleared from roads and walks without too many problems. However, a six-inch snowfall at a temperature of 10° F with strong winds will likely result in considerable blowing and drifting of snow, which can choke highways, strand travelers, and isolate towns. Even after the snow stops falling, the snow on the ground may continue to blow and drift for hours, perhaps days, depending on how long the winds remain high. Conditions may continue to be just as bad as when the snow was falling, preventing snow removal from streets and highways.

Freezing rain or ice storms occur when rain developing in a relatively warm (above freezing) layer of air falls through a layer of air that is below freezing (25-32° F). The rain is "supercooled" (still liquid) as it falls through the colder layer near the surface of the earth. When

the supercooled, but still liquid, raindrops strike the ground, or an object already below freezing, they freeze on contact. The resulting coat of ice is commonly known as “glaze”.

A heavy accumulation of ice can topple power and telephone lines, television towers, and trees. Highways become impossible to travel on and even stepping outdoors on foot can be an extremely risky undertaking. The severity of an ice storm (that is, the amount of damage) depends on the amount of rain and thus, icing taking place; the strength of the wind; and whether the storm strikes an urban or rural area. Developed urban areas tend to suffer more damage than underdeveloped areas, because of the concentration of utilities and transportation systems (aircraft, trains, buses, trucks, and cars), all of which may be affected to a great degree by the icing.

3.2.2. Winter / Ice Storm History

Newspaper archives from the *Courier* and *The News-Gazette* provide records of the history of ice storms in the Champaign-Urbana area. The ice storm of 1967 is one of Champaign-Urbana’s earliest and worst storms. The winds and ice wreaked havoc on trees and power and telephone lines, leaving some 75% of the residents of the Champaign-Urbana area and the surrounding areas without electricity for more than two days. It took nearly two weeks for electrical power to be restored in some rural areas. When it was over, area power and telephone companies estimated more than $4.5 million in damage to their lines alone.

The ice storm of 1978 was the next severe storm in the area. Power lines fell under the weight of ice, utility poles collapsed, and transformers shorted out, leaving thousands of area residents without power as temperatures fell below the freezing mark.

On February 14, 1990, an ice storm caused widespread electrical power outage and destroyed many trees (*Figure 3.12*). The phenomenon was described in Champaign-Urbana’s *The News Gazette* as follows, “The temperature was just below freezing at ground level. It was just above freezing a few hundred feet up. The rain chilled as it fell but didn’t freeze. As soon as the ‘supercooled’ rain hit anything on the ground, though, it stuck and immediately turned to ice.” The result was devastating, particularly to the communities’ trees. Some estimated at least half the trees in Champaign and Urbana – both having the designation of being a ‘Tree City USA’ - were damaged. Trees and tree branches, encased in ice and tangled in power lines, fell on houses, streets, and cars. Utility lines, blown by the wind and coated with a half-inch ice that increased their weight ten to twenty times, ‘galloped’ together and short-circuited. Electrical lights in homes went out and stayed out. One resident of rural Urbana is reported to have stayed without heat, electricity, and water for almost six days. The damage was so severe that 24 central Illinois counties, including Champaign County, were declared disaster areas making them eligible for federal and state grants. The City of Urbana incurred over $768,000 in emergency response and clean-up costs, three times the cost incurred due to April 19, 1996 tornado. This estimate does not include private costs incurred.

Figure 3.12 Typical Damage from Ice Storm, 1990, Urbana

3.2.3. Storm Vulnerability Assessment

The State of Illinois is located within the heavy ice-loading district of the United States according to "Trees and Ice Storms: The Development of Ice Storm–Resistant Urban Tree Populations," a 1948 map from the National Bureau of Standards, (*Figure 3.13*). This designation is determined by the amount of ice accumulation on surfaces.

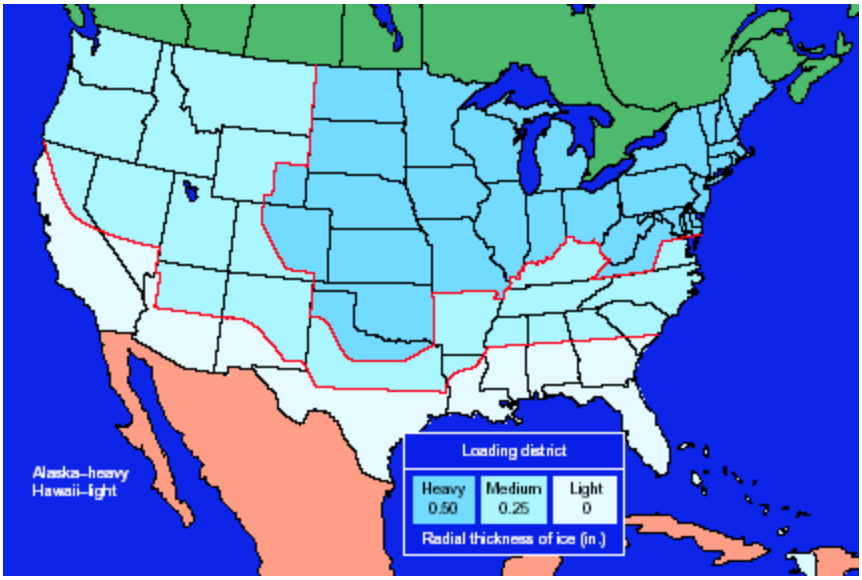


Fig. 3.13 Ice-loading Districts in the United States for Ice Accumulation on Surfaces.

The loss of electrical service to residences during a disaster is one of the most frequent results of storms in Urbana, because the City's power distribution systems are predominantly above ground. Although ice storms affect the entire City, the large number of trees, both private and public, that exist in Urbana, further aggravates the impact of ice and windstorms. Both the ice storm of 1990 and the tornado of 1996 caused power to be disrupted for many days.

3.2.4. Current Storm Mitigation Activities

The City is considering burying utility lines to reduce damages from both wind and ice storms. The feasibility study done by the City to estimate the cost of burying utility lines is explained in Section 3.1.4.

The City is also attempting to reduce storm damage by selecting proper tree species. The City Arborist oversees regular tree maintenance on public rights-of-way through many activities, such as tree trimming. Illinois Power, a private power company, also works to prevent outages and potentially dangerous situations by trimming trees near power lines with permission from private property owners.

3.3. FLOODS

3.3.1. Nature of Floods

Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. Small rivers and streams are susceptible to flooding from localized weather systems that cause intense rainfall over small areas.

The floodplain is the land adjoining the channel of a river, stream, lake, other watercourse, or water body that is susceptible to flooding. There are several types of floods, such as riverine flooding, flash floods, and alluvial fan floods. These can occur for a variety of reasons, such as the formation of ice jams, breaking of dams, local drainage or high groundwater level, and fluctuation of lake levels.

3.3.2. Flood History

According to the Illinois Department of Natural Resources, Illinois has one of the largest inland systems of rivers and lakes in the United States. Over 14 % of the total land area (7,400 sq. miles) is subject to flooding. In Illinois, it is estimated that there are over 214,000 buildings located in floodplains. Floods are by far the most common natural disaster in Illinois, accounting for well over 90% of the declared disasters. Annual damages in the state average nearly 300 million dollars.

Urbana has experienced few significant floods in the recent past. According to City records, there has been only one National Flood Insurance Program (NFIP) claim worth $500 since 1978. During a flood event in May of 1990, City officials, as reported in the newspapers, estimated that Urbana suffered $771,700 in damages to public and private properties. This rainstorm was claimed to be the worst rain in fifty years, accumulating about four inches within a six-hour

period. The approximate location of this flood event and the floodplains are shown in *Figure 3.14.* Both Urbana and Champaign applied for federal aid, but their applications were rejected.

In May of 1991 heavy rains flooded the Urbana-Champaign area. Streets were barricaded to prevent cars from flooding and getting stranded. A towing service owner in Champaign reported having received forty calls to help stalled cars. Flooding along Urbana's Vine Street at the viaduct and on University Avenue near Broadway Avenue turned the Five Points intersection at University and Cunningham into two points, both pointing in the wrong direction. A more recent flooding event in January of 1993 resulted in thirty-seven flooding complaint calls to the City. Most of these flooding events in the area were caused by severe rains and not by the overflowing of Boneyard Creek.

3.3.3. Flood Vulnerability Assessment

The low relief of Champaign County and its location atop a major drainage divide creates a poorly drained landscape with shallow areas of over-bank flooding. Ponding and minor flooding are frequently consequences of the poorly drained topography of the county. Flood depths in most parts of the county are less than five feet.

The Saline Branch, Boneyard Creek, and McCullough Creek pass through the City of Urbana. Although there have been few significant floods in Urbana, there is some risk of flooding from these water bodies.

The Boneyard is essentially an open stormwater drainage creek as it flows through the two cities. Ninety percent of the time it contains less than one foot of water. In periods of heavy rainfall, however, it floods low-lying sections. The Boneyard receives the discharge from all storm sewers in the Urbana area and is inadequate for this purpose. Because high waters in the Boneyard greatly reduce the carrying capacity of the trunk and lateral sewers connected to it, flooding is not limited to over-bank floods. There is a general surcharge of much of the drainage system throughout the flatter parts of the two cities. Since the early 1900's, various efforts have been undertaken to improve the Boneyard and help it meet the changing conditions, but these were usually localized, remedial measures. In some areas the stream has been artificially enlarged, in others it has been seriously obstructed.

Recent projects on the Boneyard have positively altered its condition. The installation of rain and stream gauges by the United States Geological Survey has allowed the City to conduct a five-year study to determine whether their construction projects have accomplished the City's goals. The information gathered will be used to make flood control decisions in the future and to verify that Urbana has had no negative impact upon these projects.

Peak flow discharges on the Boneyard Creek at Urbana can obtained from the USGS gage (refer *Figure 3.14*).

Figure 3.14 Boneyard Gage, City of Urbana

Boneyard Creek	100-yr Discharges (cfs)	10-yr Discharges (cfs)
At mouth	2,864	1,427
At gage	1,264	596

cfs=cubic feet per second

The upstream watershed boundary of Boneyard Creek lies in northwest Champaign. Land uses in the watershed are virtually all urban (residential, commercial, industrial). The creek lies entirely within the environs of the cities of Urbana and Champaign and the University of Illinois. The watershed and the channel have been greatly modified, and the natural flood plain is highly developed.

In 1999, the City of Champaign, which lies upstream from Urbana, installed a large, 38 million gallon detention basin to curb stormwater flow at peak rainfall times. The eventual goal of this and other improvements and investments to the water surface profile is to confine the 100-year floodplain within the Boneyard's banks. This will significantly reduce the risk of flooding to Urbana and other areas downstream. *Figures 3.15-3.18* (at end of chapter) are aerials that show the floodplain as it exists as of June 2003. *Figures 3.19-3.23* are channel section photos that help give a better understanding of the creek's relationship to the adjacent properties.

While the process of mitigating flooding is ongoing, it is hopeful that this goal can be achieved in the near future. Cooperation among both cities and the University has facilitated the most recent efforts.

None of the eight previously mentioned new subdivisions are being built within the floodplain. However, the floodplain is already heavily urbanized as it covers residential and downtown commercial areas in Urbana. The City has highlighted intensification of development in this hazardous area as a concern. In order to minimize property damage and loss in the area, the City is looking to develop a bicycle-pedestrian corridor along the Boneyard, particularly through the floodplain.

Urbana has approximately 300 properties in the floodplain (*Figure 3.24*). Less than 10% of these structures within the regulatory floodplain were insured in 2003. Two years ago, the market value (generally, three times the assessed value) of buildings on those properties was estimated around $12 million. While it is hard to determine exactly how much damage would result from flooding within the floodplain, Equalized Assessed Value (EAV) data of each property provides monetary values for both the land and the structures in the floodplain. These figures can be used to estimate potential monetary losses at different damage levels. As of June 2003, the land EAV of the properties in floodplain was approximately $4,118,960. The building EAV for the same properties was estimated at $13,498,590 for a total EAV of $17,617,550 (*Figure 3.23*). At 100% damage level, in which all properties within the floodplain are lost, total costs are projected at $5,813792. At a 50% damage level, total losses are predicted to be $2,906,896 (See Chapter 2, Figure 2.2 for the Official City of Urbana Existing Land Use Map).

	EAV	50% Flood Damage	100% Flood Damage
Land	$4,118,960	$679,628	$1,359,257
Building	$13,498,590	$2,227,267	$4,454,535
Total	$17,617,550	$2,906,896	$5,813,792

Figure 3.23 EAV Estimates for Floodplain Properties

3.3.4. Current Mitigation Activities

In 1980, FEMA conducted a Flood Insurance Study for the City of Urbana. This study investigated the existence and severity of flood hazards in the City. The flooding sources studied were the Saline Branch, Boneyard Creek, and McCullough Creek.

The City of Urbana participates in the National Flood Insurance Program (NFIP). In 1979, the Boneyard Creek District (*Figure 3.24*) was adopted as an overlay district of the official Zoning Map of the City. The Urbana Zoning Ordinance includes Special Flood Hazard Area (SFHA) regulations that are applicable to this district. These regulations require the properties in the floodplain to follow protective building practices. However, these regulations reduce, but do not necessarily eliminate, the risk of flooding to these properties.

Urbana's floodplain regulations include methods and provisions for:

1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
2. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters.
4. Controlling filling, grading, dredging, and other development which may increase flood damage; and
5. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

Any person, firm, or corporation has to obtain a development permit before commencing any development in the SFHA. Identification of the SFHA and the requirements for issuing a development permit are included in Article XI, Flood Hazard Areas of the Urbana Zoning Ordinance. These requirements include appropriate anchoring for manufactured homes, conditions for grant of variance, and height of lowest floor for residential and non-residential construction.

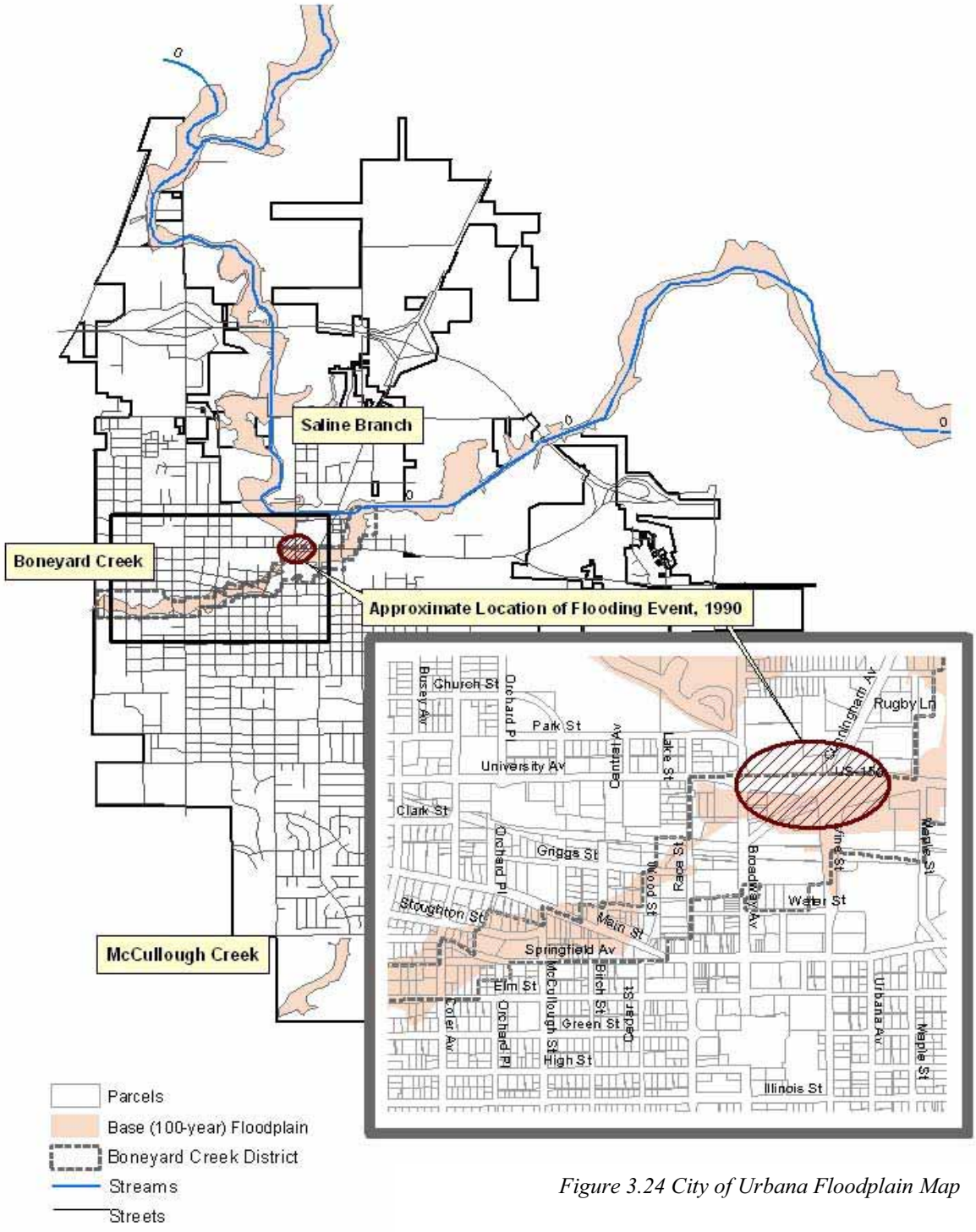


Figure 3.24 City of Urbana Floodplain Map

3.4. EARTHQUAKES

3.4.1. Nature of Earthquakes

An earthquake is a sudden motion or trembling caused by abrupt release of accumulated strain on the tectonic plates that compose the Earth's crust. As the tectonic plates move together they bump, slide, catch, and hold. Eventually, faults along or near plate boundaries slip abruptly when the stress exceeds the elastic limit of the rock, and an earthquake occurs.

Magnitude is a measure of the strength of an earthquake or the strain energy released by it, as determined by seismographic observations. On the Richter scale, magnitude is expressed in whole numbers and decimals. In qualitative terms, an earthquake with a magnitude of 5.0 is a moderate event, 6.0 characterizes a strong event, 7.0 is a major earthquake, and a great quake exceeds 8.0.

The effect of an earthquake on the Earth's surface is called the intensity. *Intensity* is a measure of the effects of an earthquake at a particular place on humans, structures, and/or the land itself. The intensity at a point depends not only upon the strength of the earthquake (magnitude), but also upon the distance from the earthquake to the point and the local geology at that point. The most commonly used intensity scale in the United States is the Modified Mercalli Intensity Scale (MMI). *Figure 3.25* shows the categorization of earthquakes by magnitude and intensity.

3.4.2. Earthquake History

In the past 200 years or so, Illinois has had approximately 160 earthquakes. According to a News-Gazette article in November 1988, Illinois State Geological Survey geophysicist, Paul Heigold, said, "There's really not a great deal of pattern to Illinois earthquakes although 80% have occurred in the southern part of the state. Most of the known faults and rifts are located in southern Illinois."

According to the USGS, seven earthquakes of intensity greater than MMI VI are known to have occurred in northern or central Illinois, in an area approximately 124 miles (200 km) from Urbana. Urbana was affected by shaking of MMI IV in September 1909 with the epicenter less than 65 miles (100 km) away from Urbana. The City was also affected in November 1968, by the largest recorded earthquake event in Illinois history. For that earthquake, Urbana experienced shaking of MMI IV. In June 1987, an earthquake measuring 5.0 on the Richter scale centered about 100 miles (160 km) southeast of Urbana-Champaign, resulted in minor damages limited to cracks in walls and basements.

Figure 3.25 Earthquake Magnitudes and Intensity

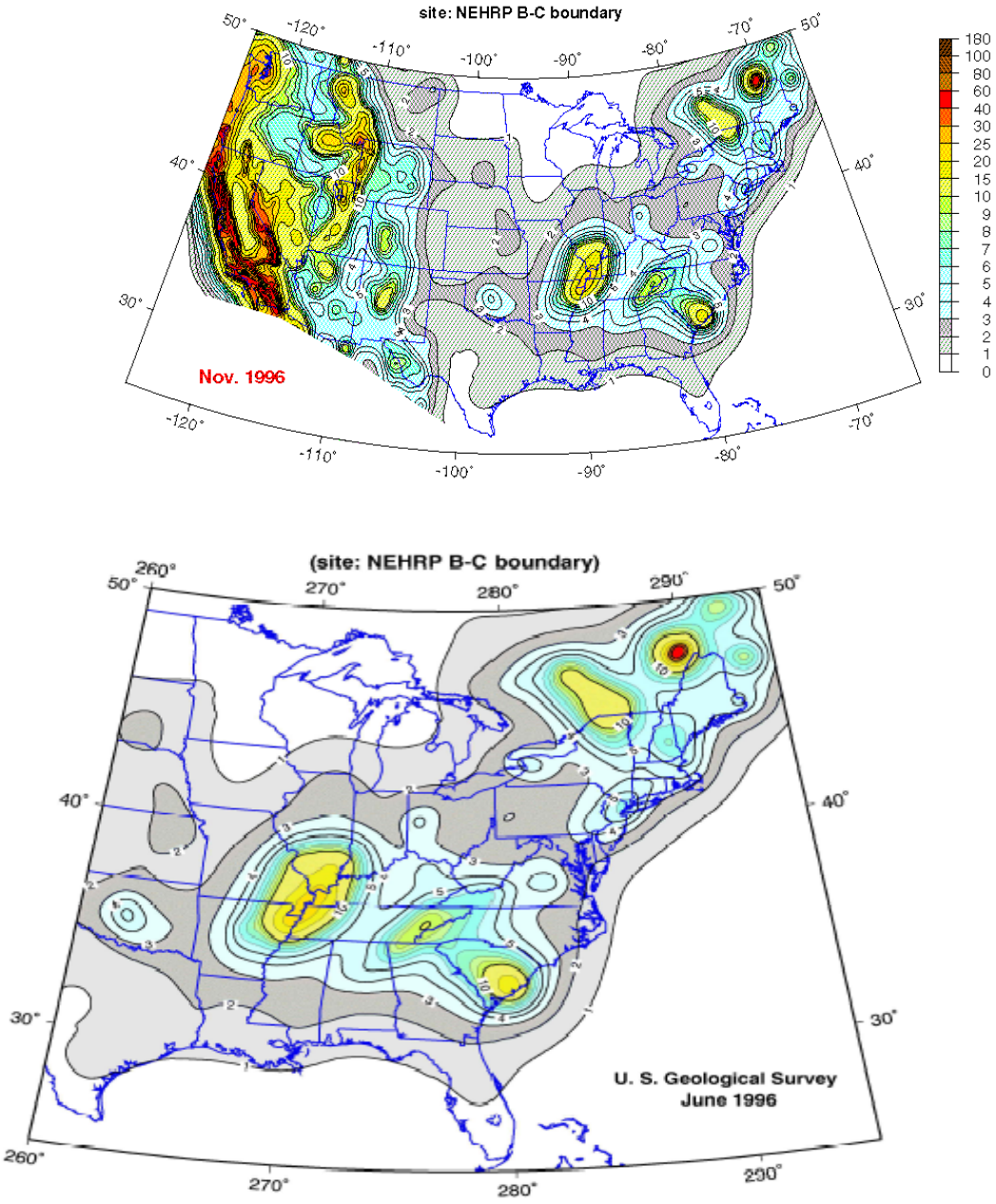
Magnitude	Intensity	Description
1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
3.0 - 3.9	II – III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0 - 4.9	IV – V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 - 5.9	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 - 6.9	VII – IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and higher	VIII or higher	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS National Earthquake Information Center (http://wwwneic.cr.usgs.gov/neis/general/handouts/mag_vs_int.html)

3.4.3. Earthquake Vulnerability Assessment

Based on 1996 USGS Seismic Hazard maps, Urbana has a 10% probability of experiencing ground shaking of 0.0368 g or greater in fifty years (*Figure 3.26*). This is a relatively low level of shaking, approximately equivalent to Modified Mercalli Intensity (MMI) V (magnitude 4.0 - 4.9).

Figure 3.26 Peak Acceleration (%g) with 10% Probability of Exceedance in 50 Years



Source: U.S. Geological Survey
National Seismic Hazard Mapping Project, 1996

The City has used the software program HAZUS to assess the risk from earthquakes. This is the first step towards mitigation. The City is currently in the process of updating its building code from the BOCA 1990 Code to the International Code 2003, which has the most current seismic provisions. Modern seismic building codes recognize varying levels of seismic hazard throughout the United States, and require localities to design buildings appropriate to the local hazard. Adoption and implementation of seismic building codes is the best way to ensure the safety of all new buildings.

In 2000, City staff in the Building Safety Division of the Community Development Services Department conducted a rapid visual survey of the buildings in the City, particularly those located in the downtown area and those that serve as critical or emergency facilities. This survey provided information on property address, use, construction type, construction year, and floor area, which could prove helpful in assessing earthquake and other disaster vulnerability. Many buildings documented were constructed with unreinforced masonry (URM). Using this survey and the 1990 edition of the BOCA code, it is estimated that less than 20% of Urbana's total building stock meets the current earthquake building code.

Efforts are being made to avoid similar construction in the downtown, because of the higher risk and cost factors of URM buildings during disasters. The redevelopment of the Stratford lot on Race Street involved the demolition of a URM building. New development on this lot is intended to be safer and less vulnerable to potential hazards.

Figures 3.15-3.18 **(at end of chapter) are aerials that show the floodplain as it exists as of June 2003.** ***Figures 3.19-3.23*** **are channel section photos**

Figure 3.15 - Floodplain Aerial 1

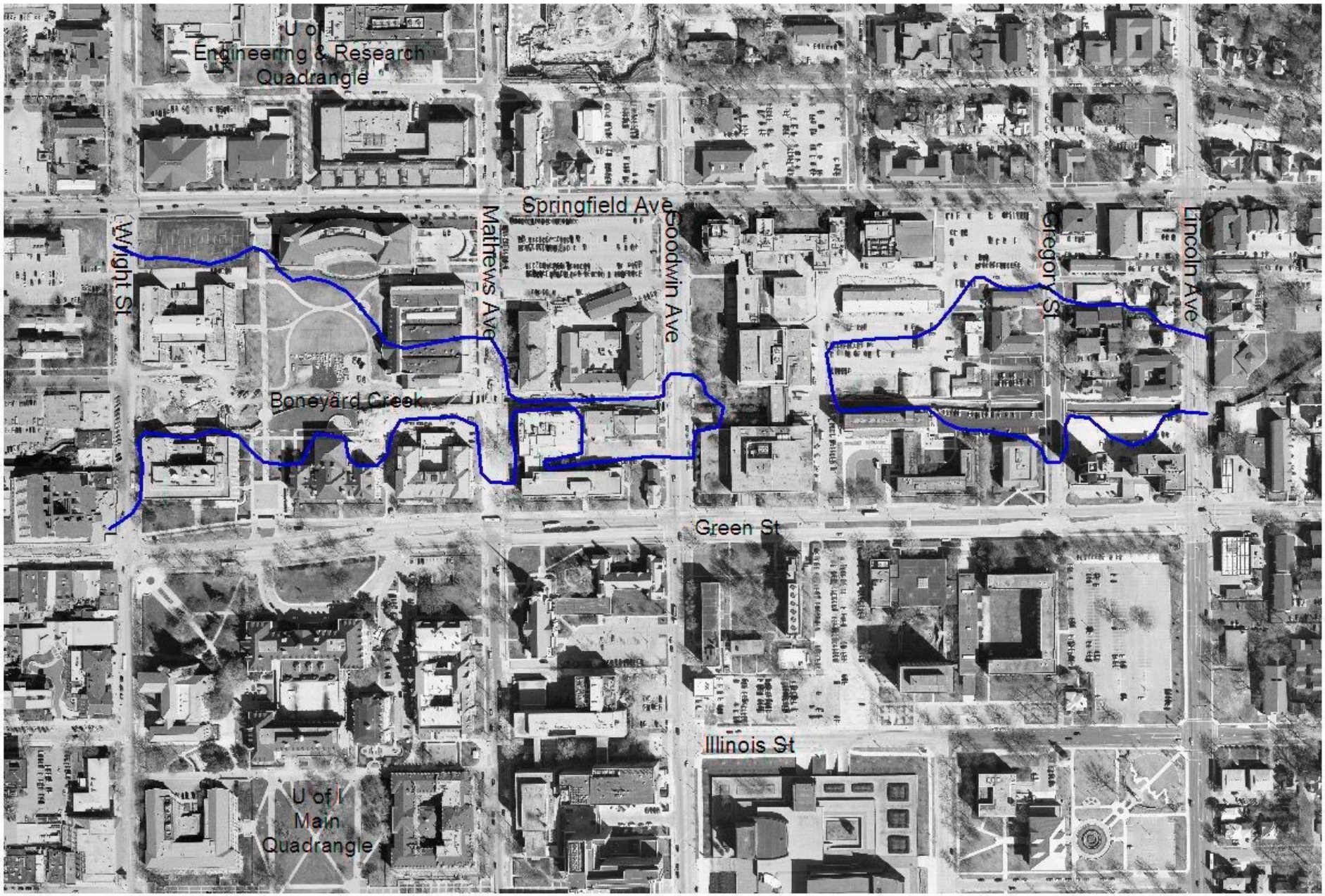


Figure 3.16 - Floodplain Aerial 2

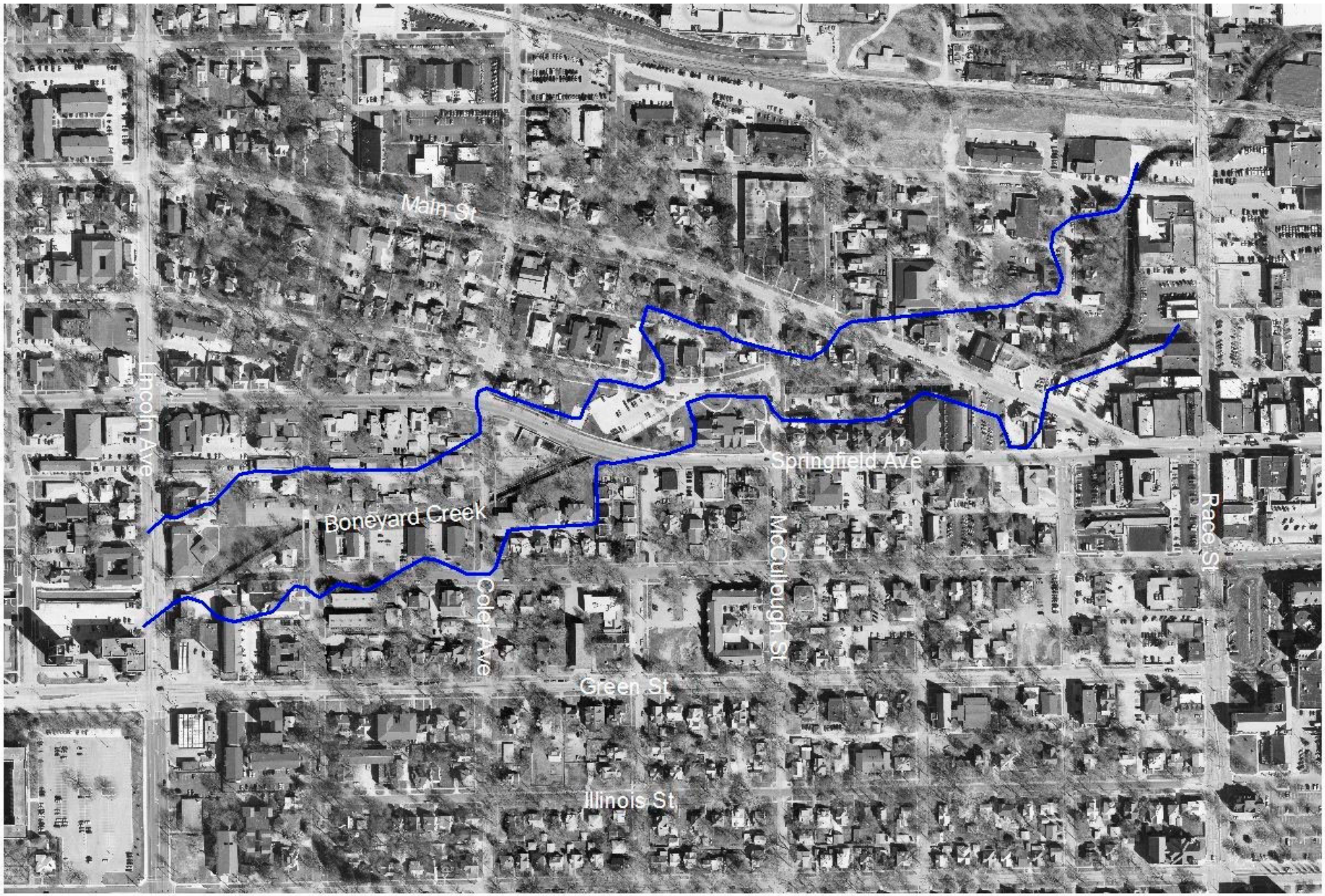


Figure 3.17 - Floodplain Aerial 3

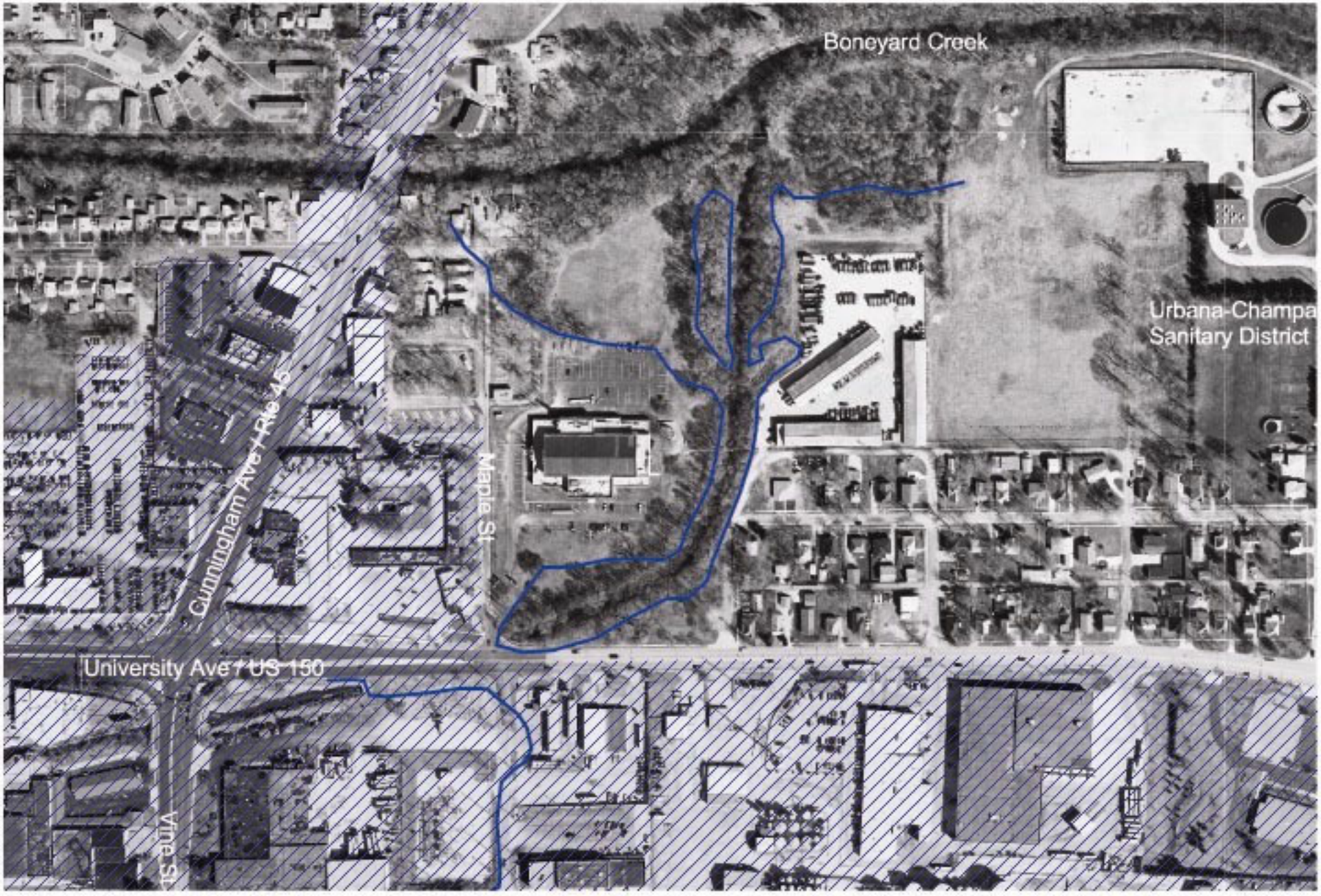


Figure 3.18 - Floodplain Aerial 4

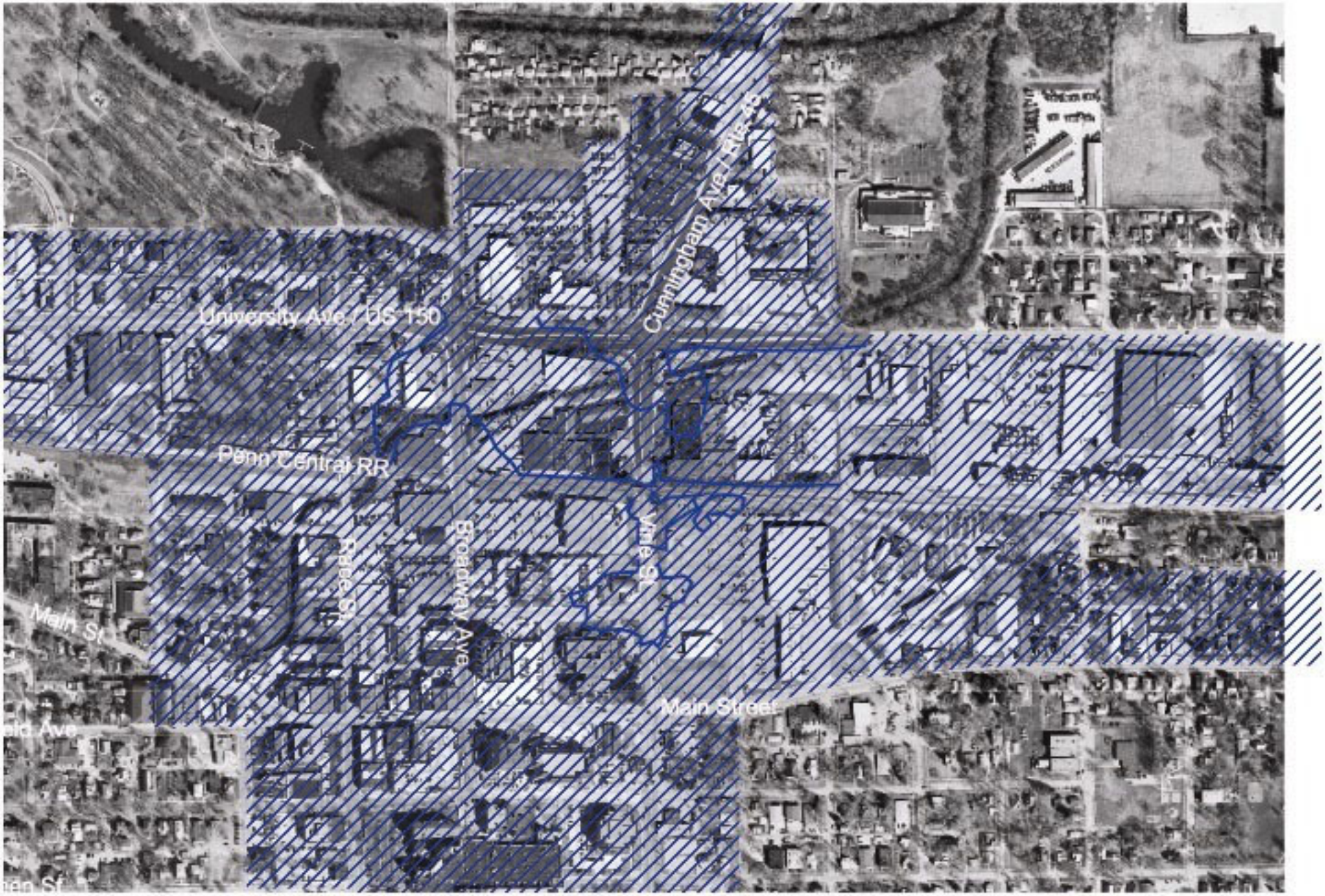


Figure 3.19 - View from Gregory Street

Figure 3.20 – View from Vine Street

Figure 3.21 - View from McCullough Street

Figure 3.22 – View from Springfield Avenue

Figure 3.23 – View from Courtesy Road

Chapter IV

MITIGATION STRATEGIES

Chapter IV. Mitigation Strategies

Measures to eliminate or reduce damage from natural hazards are identified in this chapter. After considering the full range of possible measures, those that are most appropriate for Urbana have been identified. These measures are prioritized according to the risk of the hazard and the cost, benefit, and feasibility of the mitigation measure.

The mitigation measures aim to achieve the goal of protecting life and properties in the community from hazards. The mitigation strategies are also aimed at achieving the following objectives:

- Reduce risk, using actions that are cost-effective and feasible.
- Improve the community's information base regarding its vulnerability.
- Ensure that mitigation activities are compatible with the community's other development goals.
- Coordinate the mitigation efforts of different agencies.

Cost-benefit estimates were difficult to determine for each hazard. Detailed analysis of mitigation strategies in this report are derived from the literature as well as the expert opinions and practical knowledge of Project Impact Steering Committee members. Where possible, monetary cost-benefit figures are outlined for strategies include burying power lines and subsidizing wind resistant construction. However, these numbers are relatively subjective and can be more easily and accurately calculated upon implementation in the future when additional information is available.

Figures 4.1-4.4 at the end of this chapter summarize the mitigation approaches, implementation strategies, costs, benefits, feasibility, and priority for each hazard.

4.1 Wind and Ice Storms

As discussed in Chapter III, Urbana has a relatively high risk of vulnerability to wind and ice storms. Since some mitigation measures are common to both wind and ice storms, they are discussed together in this section.

The loss of electrical service to residences during wind and ice storms is one of the most frequently experienced impacts in Urbana, because of the predominantly above ground power distribution systems. The large number of trees further aggravates the impact on these systems. The mitigation measures address these problems through the following approaches:

1. Power Supply Management Approach
   1a. Bury Power Lines
   1b. Emergency Back-Up Power Systems for Critical Facilities/Areas of the City

1a. The primary goal of burying existing overhead utility services is to minimize damage to utility lines during wind and ice storms. It is also a life safety hazard if power lines come down during the storms.

An example to illustrate the benefit of burying power lines is taken from Itasca County, Minnesota. An overhead 7,500-volt power line had a history of numerous outages and other problems prior to 1996 resulting from trees falling on the line during storms. The line serves 207 residential and 11 commercial customers, in addition to providing power to a communications tower housing radio transmitters for two rural electric cooperatives and a television transmitter. Outages were occurring seven times a year, on average, lasting anywhere from two to 24 hours. Following a federal disaster declaration the community decided to place the line underground. Since completion, any outages that have occurred on the line have not been the result of wind or falling trees. Over 4,000 residents have benefited from uninterrupted television reception that, for most of them, provides warning about hazardous weather approaching. The more-reliable radio communications have enabled the electric co-operatives to respond quicker to outages elsewhere in their systems and saved money from reduced maintenance costs for the buried line corridor.

The 'Overhead to Underground Utility Conversion' report, prepared in 2001 by the City of Urbana's Public Works Department, indicates that utility companies view burying lines as a feasible action for eliminating overhead utility and tree conflict. However, it has significant costs. For Alternative 1, which includes a full conversion of all utilities, the costs are estimated to be at least $7,000 per household. Alternative 2, which includes the conversion of the electrical facilities while maintaining the overhead telephone and cable television utilities, would cost households at least $3,800.

A pilot program for undergrounding electrical service lines was undertaken as a part of the City Project Impact activities. This program provided funds to the local power company for the burying of service lines. Costs to the homeowner were minor and involved only the services of an electrician and repair of any disturbed vegetation. Over 30 grants were provided by this program and a high level of customer satisfaction was conveyed.

Since the costs are for major utility undergrounding efforts are very high and there are no known grants available, there is little feasibility of burying existing lines in large areas. Thus, this measure is prioritized as low. However, when considering the benefit of preventing power loss it would be to the City's advantage to pursue the matter in the long-term and look for funding opportunities. It should be noted that utilities are placed underground in newer areas of the City, as this has been mandated by the City's Development and Subdivision Ordinance for several years.

1b. Critical facilities face a higher risk from power outage. They should have back up power systems. The City has a list of critical facilities in the community.

One example is taken from Faribault County in south central Minnesota. In 1997, the power company rebuilt a 9.5-mile line directly serving about 300 rural consumers. The line also serves as a back-up source of power to an additional 600 consumers. The records indicate that between 1993 and 1997 their whole system experienced over $605,000 in storm related damages and over 390,000 consumer outage hours. Since the rebuilding of this particular line there have been no outages due to ice storms or high winds.

Many critical facilities already have existing back-up power systems. Even though having back-up power systems incurs recurring costs of repair, it is a much less costly option than burying power lines. The City should have a system of regular checks to ensure that all critical facilities have adequate emergency power systems, whether managed privately or by the City.

2. Urban Forestry

2a. Improved Maintenance and Proper Species Selection

2b. Post-Disaster Clean Up Plan

The impact of ice storms can be minimized through proper planning, tree selection, and tree maintenance. Concerted action over many years is needed to minimize ice storm damage. Sustained efforts will undoubtedly reduce fatalities, injuries, monetary losses, tree damage, and cleanup costs to individuals and communities in regions where ice storms occur. Guidelines for mitigating the impact of natural disasters in urban forests and other information are available from the International Society of Arboriculture (headquarters in Savoy, Illinois), USDA Forest Service, and Illinois Department of Natural Resources.

2a. Proper tree placement and pruning on a regular cycle will decrease a tree's susceptibility to ice storms. Trees should be located where they can do the least amount of property damage, particularly that caused from trees broken by ice accumulation. On public property, the City Arborist should ensure that trees are not planted in locations where their growth will interfere with above-ground utilities— branches that grow into power lines and fail during ice storms create power outages and safety hazards. Trees that remain small should be planted under and adjacent to utility lines. Tree species, which are weak and brittle, should be avoided. Tree species such as silver maple, Siberian elm, and green ash are relatively weak and have been found to have a higher amount of damage than other sturdier species, such as oak, tulip, and Norway maple trees. Private property owners should be instructed on proper tree selection and maintenance in order to reduce ice storm damages on their properties.

2b. After storm damage has occurred, hazardous trees and branches require immediate removal to ensure safety and prevent additional property damage. Where severe ice storms occur, disaster plans should be developed to assist in recovery. These plans should identify priority routes for clearing streets. The City is currently continuing to work on both of these activities.

4.2 Wind Storm

The main goal of mitigation activities is to improve building construction to minimize damage from tornadoes and high winds. The mitigation measures can be categorized under the following approaches:

1. Building Practice and Material

1a. Modify building code to incorporate higher wind resistant construction methods.

1b. Provide funds for or subsidize wind resistant construction.

1c. Provide funds for or subsidize (e.g. tax break) the cost of constructing safe rooms.

1a. Building codes require that buildings be able to withstand a 'design wind' event. An extreme windstorm can cause winds much greater than that 'design wind'. Having a house built to 'code' does not mean that it can withstand wind from any event. Therefore, safe rooms are recommended to provide a space where people can survive extreme storms with little or no injury. Some Urbana homeowners have voluntarily built safe rooms. Urbana is currently in the process of updating its building code to the 2003 International Code. This is the same code that has been adopted by the City of Champaign. Any costs associated with complying with stricter wind protection as a part of this Code will be similar in both communities and should not have a negative impact on housing starts.

1b., 1c. Building vulnerability is alleviated by these approaches, but costs can be quite high. The City conducted a 'Cost Analysis' study for the upgrade of two demonstration homes in Urbana. The cost of a wind resistance upgrade that would achieve a 90-mile per hour wind speed design is 3% to 7% of the total construction cost. Cost figures provided by FEMA for construction of a typical safe room (8'X8') for a new home are $2000 - $6000. For existing homes, the cost would be 20% higher. If higher wind resistant construction were made mandatory, the City would incur enforcement and management costs. As a result, this approach is less feasible and given low priority. However, the City should still consider providing technical and financial support to business and homeowners who wish to participate. Further study is recommended to make such funding programs feasible.

The state of Mississippi has used the Hazard Mitigation Grant Program (HMGP) federal funds to reimburse up to 75% of the eligible cost of constructing and installing safe rooms or shelters, not to exceed $3,500 for single-family shelters or in-residence safe rooms and $5,000 for group shelters. Project participants and other non-federal sources provided the 25% non-federal share.

2. Shelters

2a. Provide new shelters.

2b. Provide incentives to encourage shelters in multi-family apartment complexes.

2c. Identify existing buildings as shelters, based on their accessibility, construction type, and ownership, and strengthen as necessary.

The alternative to building safe rooms is to provide shelters. The high costs of building new shelters make it more feasible to identify existing buildings as shelters. IEMA has also recommended this strategy in a previous study. This is a high priority measure for Urbana. The City should also provide incentives to encourage shelters at apartment complexes. Such incentives could include allowing additional floor area and/or ground coverage allowed. These shelters could even consist of a strengthened hallway or the first floor of a multistory residential building.

3. Mobile Homes

3a.'Buy out' mobile homes

3b. Modify building code for stronger tie-down and anchoring method.

3c. Provide shelters in mobile home parks

3d. Provide incentives to encourage shelters in mobile home parks

The present building code has tie-down and anchoring requirements for mobile homes. As explained in Chapter III on Hazard Assessment, stronger tie-down requirements would not ensure safety of the mobile homes. Thus, modifying the building code is prioritized as low. 'Buying out' mobile homes to minimize their vulnerability is the most effective method, but it is expensive. Even though the City has relocated one mobile home park in the past, the feasibility is low and thus, this measure is also has low precedence. To protect residents in the mobile home parks, the City could provide adequate shelters or provide incentives to encourage construction of shelters. The City should consider making it mandatory for mobile home park owners to have shelters. This requirement could be added to the provisions governing the construction of mobile home parks, as set forth in the Urbana Zoning Ordinance. A process of discussion with the mobile home park owners on all these issues is recommended to arrive at mutually agreeable decisions.

4.3 Flood

To reduce damages from flooding, two sets of polices can be adopted: corrective policies and preventive policies. Corrective policies consist of structural methods, such as flood control works, including channel modifications and storm water detention storage. Master drainage plans for the whole city should provide a framework for the flood control projects. Structural projects provide spot protection, but they must be used with care, so that they do not transfer problems elsewhere. They also tend to create a false sense of security and encourage inappropriate use of the floodplain.

Preventive policies consist of non-structural methods that typically encourage natural uses in the floodplain (public park, recreation, and open-space) by regulating new development. Stormwater runoff control is encouraged, because development can increase downstream flooding, siltation, and erosion. Other methods include public acquisition of floodplain lands, acquisition of frequently damaged properties, relocation of occupants from flood-prone areas, disclosure of flood hazard information to purchasers and renters, and development of a post-flood recovery plan that includes preventive measures.

Flooding along Boneyard Creek is frequent, but the damage is usually limited to a few properties within the floodplain (see also Chapter III: Hazard Assessment). Because high costs would exceed limited benefits, no corrective policies are recommended.

1. Building Standards and Development Regulations (Zoning and Subdivision Ordinance)

1a. Identify Properties in Floodplain to Decide Appropriate Mitigation Measures for Each Property

Measures to include:

- Relocate buildings
- Acquire damaged buildings
- Acquire undeveloped lands
- Acquire development rights
- Acquire frequently damaged properties

Acquisition and relocation can be used to reduce the occupancy and value of existing exposed property in flood hazard areas. These lands could then be used for park, recreation, and open-space purposes that preserve the natural value of the floodplain. These measures are expensive and are ranked as low priorities. The City should consider these actions after a detailed cost-benefit study based on current watershed condition.

1b. Transfer Development Rights to Lower Risk Areas

To discourage new development in the floodplain, the City can provide a transfer of development rights to a lower-risk area at a very low monetary cost. Urbana tried this measure during development of the Boneyard Creek Master Plan, but it was not well received by residents. Thus, it is presently prioritized as low, but it should be considered in the future.

1c. Flood Zone Building and Siting Regulations (Specify Height, Anchoring, Flood Proofing Requirement, etc.)

A community should formulate its regulatory systems such that floodplain uses are compatible with the natural functions of conveyance and storage. They should not reduce, restrict or impede channel conveyance capacity or increase downstream velocities. Changes can take place in the floodplain that reduce storage capacities. If filling is allowed by the local flood control ordinance, compensatory storage should be encouraged. Development should be directed to areas free from flooding. All development within the floodplain should require a permit. These elements are already incorporated in the floodplain regulations for the Special Flood Hazard Area (SFHA) and should continue. If the regulation were modified to become a more stringent requirement, then it would lower the vulnerability of new buildings, but might also decrease new home starts and/or result in a reduction in property values.

The National Flood Insurance Program (NFIP) requires that new residential buildings in the floodplain must have freeboard, i.e. must be elevated above the Base Flood Elevation. The freeboard accounts for future flood fringe development, uncertainties inherent with the flood insurance study methodologies, lack of data, waves or debris that accompany the base flood, and floods higher than the base flood. Requiring a freeboard of one or two feet of additional protection above the base elevation can provide up to twice the savings that result from meeting

the minimum NFIP requirement (as measured as a percentage of the building's value). This addition to the present regulations is prioritized as high.

2. Capital Improvement Programs

Public facilities and utilities located in the floodplain require special attention. The NFIP requires that they be located and constructed to minimize flood damage. They should be sited away from the floodplain. This approach is highly feasible and a high priority.

In general, storm water runoff control is necessary, because development can increase downstream flooding, siltation, and erosion. Excess storm water runoff caused by new development should be detained and released at a rate that will not increase peak discharges above that which occurred prior to the development. Generally, regional detention basins are more effective than on-site facilities. Storm water management plans are required whenever a new development is planned.

3. Taxation & Fiscal Policies
- **3a. Impose impact taxes**
- **3b. Provide tax breaks**

Through the taxation policy approach, the City can discourage new hazardous development by imposing impact taxes and encourage existing property owners to move out of the floodplain by offering tax breaks. The size of Urbana's floodplain limits this approach's effectiveness and incurs considerable administrative costs. It is a low priority.

4. Improve Information
- **4a. A New Flood Insurance Study**
- **4b. Monitor Rain and Stream Gage on Boneyard Creek**
- **4c. Create Integrated Information Base (common GIS and database)**

4a. The preparation of a new flood insurance study should be considered, because conditions have changed since the last flood insurance study was done in 1980. This will help to revise floodplain data, such as the height and extent of the base flood, and ensure that the regulatory mechanism is based on current watershed conditions. The City should consider applying to FEMA for a new flood insurance study or fund a private study. If the study is done to FEMA standards, it can be submitted to FEMA for a map revision. Because of the cost and revision process, the priority is medium at present, but it should be pursued in the near future.

4b. This is an ongoing project, which should be continued to improve information on the floodplain. Monitoring will also verify any impacts from the University and Champaign's Boneyard Creek's improvements. This is an ongoing activity and is prioritized as high.

4c. Spatial information on all hazards should be organized in a common GIS based database, and non-spatial information should be organized in a separate database. These together form an integrated information base that should be accessible by all the involved agencies. This will improve the efficiency in use and exchange of information so that the City and other agencies

can coordinate actions to achieve multi-hazard mitigation. Under the auspices of the Champaign County Regional Planning Commission, a Countywide GIS is currently under preparation by a consortium of interested agencies and is planned to include relevant hazards-related data.

5. Other strategies

The following actions should be pursued in the long term:

5a. Identify Properties in the Base Floodplain Once the Floodplain Has Been Revised Based on More Accurate Information

This can be done to:

- To check if properties are included in the SFHA.
- To estimate value of damage from the base flood (based on value of properties in the floodplain and vulnerable population). Compare these estimates to the cost of flood control projects or mitigation measures, such as property acquisition/relocation, building protection, flood proofing measures, etc.

5b. NFIP Communities That Use the Community Rating System (CRS) Receive A Reduction of Floodplain Insurance Premiums For Actions They Have Taken to Reduce Flood Losses.

Under this program, Urbana can apply for CRS credit. There are ten CRS classes: Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction. The CRS recognizes eighteen creditable activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. Priority is medium because the vulnerability to flooding is not high, and thus the number of beneficiaries is low.

4.4 Earthquake

1. Building Codes and Standards: Update Current Seismic Resistance Code Requirements

The basic mitigation strategy for new buildings is the adoption of regulations requiring that new buildings should be designed to resist seismic forces. The City presently follows the 1990 BOCA code and is in the process of updating it to the 2003 International Code. The International Code has high standards for seismic resistance. The City should continue the updating process.

In 2002, the BOCA Code Effectiveness Grading System was initiated by the Insurance Services Office (ISO). Under this system, communities are assigned a classification of 1 to 10. A classification of 1 represents exemplary commitment to building code enforcement and a classification of 10 indicates no recognizable enforcement. This classification helps to distinguish between communities with effective building code enforcement and those with weak enforcement. The City of Urbana will be evaluated under this system in early 2005 once it has completed the Code Update process.

2. Technical or Financial Support to Critical Facilities

2.a. Provide Technical Support for Upgrading Structures of Critical Facilities and URM Buildings

2.b. Provide Funding or Subsidies for Upgrading Structures of Critical Facilities and URM Buildings

Some existing buildings need greater attention because of their construction type or their use, such as hospitals, fire stations, schools, and historic buildings. These also include utilities and communication systems.

The City can provide owners of URM buildings and critical facilities with technical and financial support. Since there is a finite chance of seismic events, it is feasible to provide technical support and incentives to owners of URM buildings and privately owned critical facilities. The City should provide funding for upgrading structures of critical municipal buildings, because of their value to the community. The city should also consider the feasibility of financial incentives to homeowners for upgrading their buildings. These measures are prioritized high.

4.5 Public Education and Awareness

This approach receives a high priority for all hazards, but varies by focus group. The focus groups are:

Home and Business Owners - Demonstration projects can be undertaken for increasing awareness of wind resistant construction techniques for all property owners in the city. The City residents should be informed about the costs and benefits of burying utility lines. Separate informational sessions or workshops should be held for the following groups. URM buildings owners should be provided information materials about seismic risk, lifeline response, design methods, construction practice, and retrofit techniques. Home and business owners within the floodplain should be informed about appropriate protective measures and the NFIP. Business and industry owners should be encouraged to prepare an emergency management plan for their property. Apartment and mobile home park owners should be encouraged to construct or designate storm shelters for residents.

Mortgage companies and financial institutions could be encouraged or even required to insist on hazard mitigation as a condition of financing construction. Furthermore, disincentives should be discontinued, such as those that guarantee aid for reconstruction irrespective of whether or not mitigation actions were taken. This proposal has less feasibility and is prioritized low.

Builder, Construction Companies, and City Officials (*emergency management professionals, regulatory officials*) – the City should arrange for seminars conducted by the University of Illinois Building Research Council. Video and pamphlets showing building/construction techniques to protect structures from wind and seismic events should be circulated. Builders should be encouraged to incorporate hazard mitigation concepts in design and construction of buildings.

A hazard mitigation certification system could prove very useful in motivating all these focus groups to practice voluntary mitigation measures. To motivate groups and individuals, the City could recognize homeowners who practice voluntary mitigation measures by awarding them with a plaque or certificate.

FLOOD Flooding along Boneyard Creek affected 2 properties in the early 90s. There is a 1 % chance of a 100 yr. level flood every year

Figure 4.1

APPROACH	IMPLEMENTATION STRATEGY	COST	BENEFIT	FEASIBILITY	PRIORITY
1. Building Standards and Development Regulations (Zoning and Subdivision Ordinance)	A. Identify properties in floodplain to decide mitigation measures by property 1. Relocate buildings 2. Acquire damaged buildings 3. Acquire undeveloped lands 4. Acquire development rights 5. Acquire frequently damaged properties	High acquisition costs	Floodplain used for natural uses Existing buildings protected	Medium	Low
	B. Transfer development rights to lower risk areas	Administrative cost	New buildings protected	Medium	Low
	C. Flood zone regulations (specify height, anchoring, flood proofing requirement etc.)	Decrease in new home starts Enforcement costs	New buildings protected	Ongoing	High
2. Capital Improvement Programs	Site public facilities & utilities away from floodplain		New public facilities protected	High	High
3. Taxation & Fiscal Policies	A. Impose impact taxes	Decrease in new home starts Enforcement costs	Increase tax base	Low	Low
	B. Provide tax breaks	Decrease in tax base	Retain residents	Low	Low
4. Improve Information	A. New flood insurance study	Needs approval by FEMA	Update floodplain maps	Medium	Medium
	B. Monitor rain and stream gage on Boneyard creek			Ongoing	High
	C. Create integrated information base (common GIS and database)		Efficient use of information	High	High
5. Other	A. Apply for CRS (Community Rating System) credit	Staff time	Lower insurance premium	High	Medium
6. Public Education and Awareness	A. Information session for residents in floodplain (Appropriate protective measures, NFIP)	Uncertainty in reduction of vulnerability	Voluntary mitigation measures	High	High

WIND STORM

The tornado in 1996 measured F2 or F3 on the Fujita scale and damaged 112 home and businesses. There have been 36 tornadoes in Champaign County between 1950 and 1995.

Figure 4.2

APPROACH	IMPLEMENTATION STRATEGY	COST	BENEFIT	FEASIBILITY	PRIORITY
1. Improve Building Practice and Material	A. Modify building code to incorporate higher wind resistant construction methods	Decrease in new home starts Enforcement cost Cost of upgrading is 3% – 7% of total	Building vulnerability minimized	Low	Low
	B. City provides funds or subsidizes wind resistant construction with special attention to URM and wood buildings.	City has to share part of the cost Management cost	Building vulnerability reduced	Medium	Low
	C. City provides funds or subsidizes cost of constructing safe room (e.g. tax break)	Cost of a typical safe room (8'X8') for a new home from $2000 to$6000. For existing homes, the cost would be 20% higher.		Medium	Low
2. Shelters	A. Provide new public shelters	Higher monetary cost	Adequate shelters for entire city (protection from wind storm and earthquake)	Low	Low
	B. Provide incentives to encourage shelters in apartment complex shelters	Lower monetary cost Administrative cost		High	High
	C. Identify existing buildings as shelters	Lower monetary cost		High	High
3. Mobile Homes	A. 'Buy out' or relocate mobile homes	Monetary and Administrative cost	Vulnerability minimized	Medium	Low
	B. Modify building code for stronger tie-down and anchoring method	Enforcement costs	Minor reduction in vulnerability	Ongoing	Low (Continue)
	C. Provide shelters in mobile home parks	Monetary cost	Adequate shelters for mobile home parks	Medium	High
	D. Provide incentives to encourage shelters in mobile home parks	Lower monetary cost Administrative cost		Medium	High

WIND and ICE STORM

The ice storm in 1990 caused widespread electrical power outage and destroyed many trees. This storm resulted in a federal disaster declaration for the county. Emergency response and clean-up costs were $768,000. On an average, Illinois experiences 15 severe ice storms in a 10-year period.

Figure 4.3

APPROACH	IMPLEMENTATION STRATEGY	COST	BENEFIT	FEASIBILITY	PRIORITY
1. Power Supply Management	A. Burying power lines for the entire city	High capital cost	Entire city protected from power loss	Low	Low (High for long term)
	B. Emergency back up power systems for critical facilities/ areas of the city	Recurring costs of repair	Critical facilities and areas protected from power loss	Ongoing	Medium (Continue)
2. Urban Forestry	A. Post-disaster plan for damaged trees to be properly pruned or removed Identify priority routes for clearing streets	Staff time	Decrease potential hazards Improve health of trees Increase tolerance of trees to future storms Efficient clean-up process	Ongoing	High (Continue)
	B. Improve maintenance and proper species selection		Tree damage reduced during tornado and ice storms.	Ongoing	High (Continue)
3. Education and Awareness	A. Information sessions for insurance companies	Uncertainty in reduction of vulnerability	Voluntary mitigation measures	Low	Low (Consider after BCEGS)
	B. Information sessions for mortgage companies			Low	Low
	C. Information/training workshop for builders construction companies about multi-hazard approach for construction resistant to wind, flood			Medium	High
	D. Information sessions for home and business owners			Medium	High

EARTHQUAKE

There hasn't been an earthquake in the recent past. The greatest risk comes from a magnitude 6 event occurring within about 75-125 km. of Urbana. Such an event has a 0.1% - 4% annual probability (could occur once every 25 – 1000 years) and would cause approximately $15 million in direct damages.

Figure 4.4

APPROACH	IMPLEMENTATION STRATEGY	COST	BENEFIT	FEASIBILITY	PRIORITY
1. Building Codes and Standards	Update current code to BOCA seismic resistant design code • Mechanical Code, 1998 • International Residential Code, 2000 • International Building Code, 2000 BCEGS (BOCA Code Effectiveness Grading System) will be done by ISO in 2002	Enforcement cost	Vulnerability minimized for new buildings	Ongoing	High (Continue)
2. Technical or Financial Support	A. Provide technical support for upgrading structures of critical facilities and URM buildings		Reduction of vulnerability for existing high-risk buildings	High	High
	B. Provide funding or subsidize for upgrading structures of critical facilities and URM buildings	Higher monetary cost		Low	High (for Critical Municipal Facilities)
3. Education and Awareness	A. Seminar or Workshop for home and business-owners of URM buildings	Uncertainty in reduction of vulnerability	Voluntary mitigation measures	Medium	High
	B. Information/training workshop for emergency management professionals / regulatory officials			Low	High

Chapter V

ACTION PLAN

Chapter V. Action Plan

General recommendations for mitigation strategies appear in Chapter IV. This chapter converts those general recommendations to specific action items. Each action item is accompanied with the appropriate agencies and tentative suggested time frames in Section 5.1. Recommendations for monitoring and updating the plan to ensure effective plan implementation are outlined in Section 5.2.

The action items are aimed at carrying out all possible mitigation activities, either immediately or in the long term. For low priority strategies, this plan suggests activities that would improve information and help determine future courses of action. Actions for low priority strategies should not be overlooked since they need to be implemented when resources become available in the future.

5.1 Actions

The action items are organized by the implementing agency. *Figure 5.1* summarizes action items with suggested time frames and is organized by agencies appropriate for implementation.

Figure 5.1. Action Plan Summary

	Action Item	Suggested Time Frame	Lead Office
1	Hazard Mitigation Coordinator	Immediately after plan adoption	City of Urbana Building Safety Division
2	Shelter designation program: Identify existing buildings as shelters	Within 18 months of plan adoption	City of Urbana Fire Department and Building Safety Division
3	Consider incentives for shelters in multi family apartment complexes	1 year from plan adoption	City of Urbana Building Safety Division
4	Mobile Home Shelter Program	2 to 3 years after adoption	
5	Cost-Benefit Analysis of Buy-Out of Mobile Homes	1 to 2 years after adoption	
6	Floodplain Study Program	1 to 2 years after adoption	
7	Community Rating System	1 year from adoption	
8	Conduct zoning study for possible Transfer of Development Rights	1 year from adoption	
9	Create integrated information base for multi-hazard applications	1 year from adoption	City of Urbana *Coordinating Agency: Champaign County Regional Planning Commission*
10	Technical Assistance Program for upgrading URM buildings	6 months from adoption	City of Urbana Building Safety Division
11	Feasibility study of financial assistance to improve safety of existing buildings	1 year from adoption	
12	Financial Assistance Program for retrofitting URM buildings	1 year from adoption	
13	Certification Program for retrofitting URM buildings	1 year from adoption	
14	Ensure emergency backup power system for critical facilities	3 months from adoption	
15	Improve public awareness and education	1 year from adoption	City of Urbana Fire Department *Coordinating Agencies: Champaign County Emergency Services and Disaster Agency (ESDA), and American Red Cross*

Action Item 1. Hazard Mitigation Coordinator

Designate coordination of all mitigation activities to an existing staff member or appoint a new member. This is recognized as the most critical action to ensure that mitigation activities are implemented. It is also important for maintaining continuity and interest of the involved agencies. This is to be done immediately after plan adoption.

Action Item 2. Shelter Designation Program: Identify Existing Buildings As Shelters

Buildings that are easily accessible and have a relatively safe structure, a capacity to accommodate people, and favorable ownership should be designated as shelters and strengthened, if necessary.

Refer to Mitigation Strategy 2c, Section 4.2 in Chapter IV.
Suggested Time Frame: Initiate within 18 months of plan adoption.

Action Item 3. Consider Zoning Ordinance Amendment to Develop Incentives for Shelters for Multi-Family Apartment Complexes

These shelters could even consist of a strengthened hallway or the first floor of a multistory residential building. Incentives could include greater floor space; increased ground coverage, permitting mixed use, and/or granting a density bonus.

Refer to Mitigation Strategy 2b, Section 4.2 in Chapter IV.
Suggested Time Frame: One year from plan adoption.

Action Item 4. Mobile Home Shelter Program

This program is recommended to facilitate construction of shelters in mobile home parks. Issues include lack of space for shelters in existing mobile home parks and, most likely, an increase in monthly payments associated with the cost of the shelter. These issues need to be discussed among mobile home park owners, residents, city officials, and insurance companies to improve safety of mobile home park residents.

The program's activities should include:

- Pursue funding opportunities for shelters, such as hazard mitigation grants.
- Consider cost sharing by the City through the use of special funds, such as Community Development Block Grants.
- Consider zoning ordinance amendments to require shelters for new mobile home park developments.

Refer to Mitigation Strategy 3, Section 4.2 in Chapter IV.
Reference: A Safe Place to Go (On the Line): The Mississippi Safe Room-Storm Shelter Initiative in Natural Hazards Observer.
Lee County Zoning Ordinance (Appendix B)
Suggested Time Frame: Two to three years from plan adoption

Action Item 5. Cost-Benefit Analysis of Buy-Out of Mobile Homes

The City should study the costs and benefits of buy-out of mobile homes. There are four small mobile home parks remaining within the City limits and several additional parks just outside of the corporate limits.

Suggested Time Frame: One to two years from plan adoption.

Action Item 6. Floodplain Study

Further identification of properties in the floodplain is recommended to improve information on vulnerability and damage estimates. This would help to evaluate options of buy out, relocation, or other flood-proofing measures.

Consider applying to FEMA for a new flood insurance study or fund a private study. If the study is done to FEMA standards, it can be submitted to FEMA for a map revision. The City has begun the process of investigating remapping in conjunction with the City of Champaign and the University of Illinois.

Refer to Mitigation Strategy 4a, Section 4.3 in Chapter IV.
Reference: Illinois Home Study Course (www.illinoisfloods.org), Chapter 4 and 7.
Suggested Time Frame: One to two years from plan adoption.

Action Item 7. Community Rating System

The City should assess the potential benefits of the Community Rating System. If it appears to be beneficial, the City should consider applying for a flood insurance premium rate discount under the Community Rating System. The application should include all flood mitigation activities being implemented by the City and other agencies. Identify additional activities that could be employed in order to receive the next higher classification.

Refer to Mitigation Strategy 5b, Section 4.3 in Chapter IV.
Reference: Subdivision Design in Flood Hazard Areas
Floodplain Management: Local Floodplain Administrator's Manual
Suggested Time Frame: One year from plan adoption.

Action Item 8. Conduct Zoning Study for Possible Transfer of Development Rights

For transferring development rights of properties in the floodplain to other parts of the city, potential areas need to be identified to which development rights can be transferred. After identified zones are mapped, the City should consider appropriate zoning ordinance amendments.

Refer to Mitigation Strategy 1.b, Section 4.3 in Chapter IV.
Suggested Time Frame: One year from plan adoption.

Action Item 9. Create Integrated Information Base for Multi-Hazard Applications

For all mitigation activities and future planning decisions to be coordinated, an integrated information base is recommended. This information should be accessible to all relevant departments in the City and outside agencies. It could be developed as a common GIS database. This data should be integrated into the countywide GIS that is currently under development.

Refer to Mitigation Strategy 4c, Section 4.3 in Chapter IV.
Suggested Time Frame: One year from plan adoption.
Coordinating Agency: Champaign County Regional Planning Commission

Action Item 10. Technical Assistance Program

Initiate a technical assistance program for supporting wind storm resistant construction and upgrade unreinforced masonry (URM) structures to minimize earthquake damage:

- Dedicate staff for answering public queries.
- Organize workshops and public meetings for interested citizens and provide them with plans and technical advice.
- Provide information on the City's website.

Refer to Mitigation Strategy 2a, Section 4.4 in Chapter IV.
Reference: Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability (Section - Federal Technical Assistance and Funding).
Suggested Time Frame: Six months from plan adoption.

Action Item 11. Feasibility Study for Financial Assistance to Improve Safety of Existing Buildings

- Study feasibility of funding for wind resistant construction and construction of safe rooms.
- Study feasibility of low interest loan program to support upgrade of URM buildings.
- Explore funding opportunities from various federal, state, and private agencies

Refer to Mitigation Strategy 1b., 1c., Section 4.2 and Mitigation Strategy 2b., Section 4.4 in Chapter IV.
Reference: Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability (Section - Federal Technical Assistance and Funding), Interagency Hazard Mitigation Team Report: Long-term hazard mitigation alternatives and funding sources for State and local Governments
Suggested Time Frame: One year from plan adoption.

Action Item 12. Financial Assistance Program for Retrofitting URM Public Buildings

- Identify URM buildings with high public usage and function and prioritize them by use, occupancy and ownership.
- Provide financial support for upgrading critical municipal facilities with URM structure, if any.

Refer to Mitigation Strategy 2, Section 4.4 in Chapter IV.
Reference: Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability (Section - Federal Technical Assistance and Funding), Interagency Hazard Mitigation Team Report: Long-term hazard mitigation alternatives and funding sources for State and local Governments
Suggested Time Frame: One year from plan adoption.

Action Item 13. Certification Program

Recognize property owners who practice voluntary mitigation measures to motivate others. An award of a plaque or certificate could be considered.

Refer to Section 4.5 in Chapter IV.
Suggested Time Frame: One year from plan adoption.

Action Item 14. Protect Critical Facilities

- Maintain the list of critical facilities and ensure that all critical facilities have adequate emergency power systems on a regular basis.
- Ensure emergency access to critical facilities.

Refer to Mitigation Strategy 1b, Section 4.2 in Chapter IV.
Suggested Time Frame: Three months from plan adoption.

Action Item 15. Improve Public Awareness and Education

Periodically inform the public about the community's risks, ongoing mitigation activities, and the voluntary mitigation options and incentives made available by the City, e.g. benefits of moving away from floodplain, availability of plans, and other information for retrofitting URM buildings.

- Make information available online.
- Organize special meetings and information sessions for the various focus groups.
- Encourage business and industry owners to prepare an emergency management plan for their property.

Refer to Section 4.5 in Chapter IV.
Reference: Emergency Management Guide for Business & Industry
Hazard Mitigation Strategy Report and Planning Guidance
Suggested Time Frame: One year from plan adoption.
Suggested Time Frame: One year from plan adoption.
Coordinating Agency: Champaign County Emergency Services and Disaster Agency (ESDA), American Red Cross.

5.2 Monitoring and Evaluation

It is recommended that the plan be reviewed on a yearly basis and updated every five years. The City's Planning Division staff will be responsible for facilitating the plan update process, which can be coordinated with the Urbana Comprehensive Plan review and update process. This plan should be incorporated into the Comprehensive Plan as a stand-alone element that represents the hazard component. It is recommended that the City's Plan Commission review this plan on an annual basis along with other planning efforts. The formation of a hazard committee that meets annually or semiannually would facilitate this process and be the responsibility of Planning Division staff.

As with all of the City's comprehensive planning activities, any adoption or amendment to the Hazard Mitigation Plan would occur as part of a public hearing process before the Urbana Plan Commission, with notification to media and to interested parties. Regular plan review activities are also noticed as a part of the regular agenda for Plan Commission and/or City Council meetings. All of the Urbana Plan Commission and City Council meetings are open to the public and televised on a local cable access channel. The City's Planning Division staff will seek public input through public notices, announcements, and presentations to interested civic groups. In addition, the Hazard Mitigation Plan will be available for public review through posting at the City's website (www.city.urbana.il.us) and placement at the Urbana Free Library and City Building. The City provides electronic copies (CD-ROM) of planning documents free of charge and can also provide hard copies for the cost of reproduction or as a loan copy.

A standard survey or document review form should be created and used to easily facilitate the update each term. The updated document may be used to summarize the accomplishments of the past year and help the community to prioritize community mitigation goals for the next year. If the document results in changes to the plan, it is then subject to the standard review processes of the Plan Commission and City Council.

Revised plans should be forwarded to the Illinois Emergency Management Agency (IEMA) for review and approval for the Hazard Mitigation Grant Program and other possible funding sources.

The Mitigation Plan also should be updated when a disaster occurs in the community, whether or not it receives a Presidential Declaration. It is recommended that the update be completed as soon as possible, but by no later than the end of the calendar year following the calendar year in which the disaster occurs. The earlier the plan is amended, the sooner funding would become available.

APPENDIX A

Land Use Development Code
FEMA Interim Final Rule

LAND DEVELOPMENT CODE
Chapter 10 DEVELOPMENT STANDARDS*
ARTICLE III. DESIGN STANDARDS AND REQUIREMENTS*
DIVISION 1. GENERALLY
Sec. 10-256. Bikeways and pedestrian ways.

(3) *On-site facilities.* All sidewalks constructed within the development must be a minimum of four feet in width and constructed of either (1) four-inch thick Portland cement concrete, or (2) a minimum of $1^1/_2$-inch asphaltic concrete of FDOT type S-III on a four-inch limerock base and six-inch type B sub-grade. For facilities constructed of Portland cement concrete, all driveway crossings must be a minimum of six inches thick. The applicant may submit an alternative design, subject to the approval of the director, provided it is structurally equal to or better than, the options set forth above.

(e) *Maintenance.* On-site bikeways and pedestrian ways must be maintained by the property owner's association through the operation and maintenance covenants. The county department of transportation will maintain bikeway and pedestrian way facilities located within county right-of-way.

(f) *Waiver of requirement.* Notwithstanding the provisions of paragraphs (a) through (e), bikeways and pedestrian ways will not be required where the director of zoning and development services determines that:

(1) Their establishment would be contrary to public safety;

(2) The cost would be excessively disproportionate to the need or probable use;

(3) Other available means or factors suggest an absence of need.

(Ord. No. 95-12, § 4, 7-12-95; Ord. No. 96-06, § 4, 3-20-96; Ord. No. 97-10, § 3, 6-10-97; Ord. No. 00-14, § 3, 6-27-00)

Sec. 10-257. Marina design.

The marina design criteria set forth in objective 98.6 and policies 98.6.1 through 98.6.16 of the Lee Plan will be utilized in evaluating the design of new marinas or the expansion of wet slip facilities or boat ramps.

(Ord. No. 92-44, § 7(G), 10-14-92; Ord. No. 94-07, § 8, 2-16-94; Ord. No. 97-10, § 3, 6-10-97)

Cross reference(s)--Marine facilities and structures, ch. 26; zoning regulations pertaining to marine facilities, § 34-1861 et seq.

Sec. *10-258.* Emergency shelters for mobile home or recreational vehicle developments.

For all mobile home or recreational vehicle developments there shall be required an emergency shelter, which shall be a building of wood frame, metal or CBS construction. The size of each emergency shelter shall be determined by using the total number of units and spaces multiplied by 2.4 (representing the average number of persons per household), multiplied by the shelter space requirement of 20 square feet of usable floorspace per person, and multiplied by the maximum estimated percentage of evacuating population that would use a shelter (45 percent), which would equal the total required size of the emergency shelter. In no case, however, shall this section be interpreted to require construction of a shelter with less than 1,000 square feet of floor area. The shelter shall be elevated to a minimum height equal to or above the worst case Category 3 flooding level utilizing the National Weather Service Storm Surge Model, "SLOSH."

(Ord. No. 92-44, § 7(H), 10-14-92; Ord. No. 94-07, § 8, 2-16-94)

Sec. 10-259. Placement of structures in easements.

No buildings or structures shall be placed in easements where placing a building or structure in the easement is contrary to the terms of the easement or interferes with the use of the easement.

(Ord. No. 92-44, § 7(I), 10-14-92; Ord. No. 94-07, § 8, 2-16-94)

Sec. 10-260. Off-street parking and loading requirements.

(a) Off-street parking requirements for developments that are subject to this chapter are specified in chapter 34, article VII, division 26. The development order drawings shall show all parking areas to be provided on the project. Off-street parking for all projects that are subject to this chapter shall comply with the off-street parking requirements specified in chapter 34.

(b) Off-street loading requirements for developments that are subject to this chapter are specified in chapter 34, article VII, division 25. The development order drawings shall show all off-street loading areas to be provided on the project. Off-street loading areas for all projects that are subject to this chapter shall comply with the off-street loading requirements specified in chapter 34.

(Ord. No. 92-44, § 8, 10-14-92)

Sec. 10-261. Refuse and solid waste disposal facilities.

(a) *Provision of container spaces.* All new construction of multifamily residential developments, commercial businesses, and industrial uses must provide sufficient on-site space for the placement of garbage containers or receptacles, and sufficient space for recyclable materials collection containers. At a minimum, the following area requirements must be provided:

Commercial Business Building Sq. Ft.	Multifamily Developments Units	Minimum sq. ft. for Garbage Collection	Minimum sq. ft. for Recyclable Collection
	5--25	120	48
	25+	168 sq. ft. (120 + 48) for first 25 units plus 4.8 square feet for each additional dwelling unit.	
0--5,000		60	12
5,001--10,000		80	24
10,001--25,000		120	48
25,000+		168 sq. ft. (120 + 48) for first 25,000 sq. ft. plus 4.26 sq. ft. for each additional 1,000 sq. ft.	

(b) A minimum overhead clearance of 22 feet is required.

(c) All storage areas/containers must be adequately shielded by a landscaped screen or fencing along at least three sides.

(Ord. No. 98-03, § 2, 1-13-98; Ord. No. 98-11, § 2, 6-23-98)

Secs. 10-262--10-280. Reserved.

DIVISION 2. TRANSPORTATION, ROADWAYS, STREETS AND BRIDGES

Sec. 10-281. Official trafficways map.

Federal Register

Tuesday,
February 26, 2002

Part III

Federal Emergency Management Agency

44 CFR Parts 201 and 206

Hazard Mitigation Planning and Hazard Mitigation Grant Program; Interim Final Rule

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Parts 201 and 206

RIN 3067–AD22

Hazard Mitigation Planning and Hazard Mitigation Grant Program

AGENCY: Federal Emergency Management Agency.

ACTION: Interim final rule.

SUMMARY: This rule addresses State mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. This rule also requires that repairs or construction funded by a disaster loan or grant must be carried out in accordance with applicable standards and says that FEMA may require safe land use and construction practices as a condition of grantees receiving disaster assistance under the Stafford Act.

DATES: *Effective Date:* February 26, 2002.

Comment Date: We will accept written comments through April 29, 2002.

ADDRESSES: Please send written comments to the Rules Docket Clerk, Office of the General Counsel, Federal Emergency Management Agency, 500 C Street, SW., room 840, Washington, DC 20472, (facsimile) 202–646–4536, or (email) *rules@fema.gov.*

FOR FURTHER INFORMATION CONTACT: Margaret E. Lawless, Federal Insurance and Mitigation Administration, Federal Emergency Management Agency, 500 C Street, SW., Washington, DC, 20472, 202–646–3027, (facsimile) 202–646–3104, or (email) *margaret.lawless@fema.gov.*

SUPPLEMENTARY INFORMATION:

Introduction

Throughout the preamble and the rule the terms ''we'', ''our'' and ''us'' refer to FEMA.

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under § 104 the Disaster Mitigation Act of 2000, (DMA 2000) P.L. 106–390, provides new and revitalized approaches to mitigation planning. This section: (1) Continues the requirement for a Standard State Mitigation plan as a condition of disaster assistance; (2) provides for States to receive an increased percentage of HMGP funds (from 15 to 20 percent of the total estimated eligible Federal assistance) if, at the time of the declaration of a major disaster, they have in effect a FEMA-approved Enhanced State Mitigation Plan that meets the factors listed in this rule; (3) establishes a new requirement for local mitigation plans; and (4) authorizes up to 7 percent of the HMGP funds available to a State to be used for development of State, tribal, and local mitigation plans. We will give Indian tribal governments the opportunity to fulfill the requirements of § 322 either as a grantee or a subgrantee. An Indian tribal government may choose to apply for HMGP funding directly to us and would then serve as a grantee, meeting the State level responsibilities, or it may apply through the State, meeting the local government or subgrantee responsibilities.

Section 322, in concert with other sections of the Act, provides a significant opportunity to reduce the Nation's disaster losses through mitigation planning. In addition, implementation of planned, pre-identified, cost-effective mitigation measures will streamline the disaster recovery process. The Act provides a framework for linking pre- and post-disaster mitigation planning and initiatives with public and private interests to ensure an integrated, comprehensive approach to disaster loss reduction. The language in the Act, taken as a whole, emphasizes the importance of strong State and local planning processes and comprehensive program management at the State level. The new planning criteria also support State administration of the HMGP, and contemplate a significant State commitment to mitigation activities, comprehensive State mitigation planning, and strong program management.

The planning process also provides a link between State and local mitigation programs. Both State level and local plans should address strategies for incorporating post-disaster early mitigation implementation strategies and sustainable recovery actions. We also recognize that governments are involved in a range of planning activities and that mitigation plans may be linked to or reference hazardous materials and other non-natural hazard plans. Improved mitigation planning will result in a better understanding of risks and vulnerabilities, as well as to expedite implementation of measures and activities to reduce those risks, both pre- and post-disaster.

Section 409 of the Stafford Act, 42 U.S.C. 5176, which required mitigation plans and the use of minimum codes and standards, was repealed by the DMA 2000. These issues are now addressed in two separate sections of the law: mitigation planning is in section 322 of the Act, and minimum codes and standards are in section 323 of the Act. We previously implemented section 409 through 44 CFR Part 206, Subpart M. Since current law now distinguishes the planning from the codes and standards in separate sections, we will address them in different sections of the CFR. We address the new planning regulations in Part 201 to reflect the broader relevance of planning to all FEMA mitigation programs, while the minimum standards remain in Part 206, Federal Disaster Assistance, Subpart M. The regulations implementing the Hazard Mitigation Grant Program are in Part 206, Subpart N. This rule also contains changes to Subpart N, to reflect the new planning criteria identified in section 322 of the Act.

The administration is considering changes to FEMA's mitigation programs in the President's Budget for FY 2003. However, States and localities still would be required to have plans in effect, which meet the minimum requirements under this rule, as a condition of receiving mitigation assistance after November 1, 2003.

Implementation Strategy. States must have an approved hazard mitigation plan in order to receive Stafford Act assistance, excluding assistance provided pursuant to emergency provisions. These regulations provide criteria for the new two-tiered State mitigation plan process: Standard State Mitigation Plans, which allow a State to receive HMGP funding based on 15 percent of the total estimated eligible Stafford Act disaster assistance, and Enhanced State Mitigation Plans, which allow a State to receive HMGP funds based on 20 percent of the total estimated eligible Stafford Act disaster assistance. Enhanced State Mitigation Plans must demonstrate that the State has developed a comprehensive mitigation program, that it effectively uses available mitigation funding, and that it is capable of managing the increased funding. All State Mitigations Plans must be reviewed, revised, and re-approved by FEMA every three years. An important requirement of the legislation is that we must approve a completed enhanced plan *before* a disaster declaration, in order for the State to be eligible for the increased funding.

We will no longer require States to revise their mitigation plan after every disaster declaration, as under former

section 409 of the Act, 42 U.S.C. 5176. We recommend, however, that States consider revising their plan if a disaster or other circumstances significantly affect its mitigation priorities. States with existing mitigation plans, approved under former section 409, will continue to be eligible for the 15 percent HMGP funding until November 1, 2003, when all State mitigation plans must meet the requirements of these regulations. If State plans are not revised and approved to meet the Standard State Mitigation Plan requirements by that time, they will be ineligible for Stafford Act assistance, excluding emergency assistance.

Indian tribal governments may choose to apply directly to us for HMGP funding, and would therefore be responsible for having an approved State level mitigation plan, and would act as the grantee. If an Indian tribal government chooses to apply for HMGP grants through the State, they would be responsible for having an approved local level mitigation plan, and would serve as a subgrantee accountable to the State as grantee.

This rule also establishes local planning criteria so that these jurisdictions can actively begin the hazard mitigation planning process. This requirement is to encourage the development of comprehensive mitigation plans before disaster events. Section 322 requires local governments to have an approved local mitigation plan to be eligible to receive an HMGP project grant; however, this requirement will not fully take effect until November 1, 2003. FEMA Regional Directors may grant an exception to this requirement in extenuating circumstances. Until November 1, 2003, local governments will be able to receive HMGP project grant funds and may prepare a mitigation plan concurrently with implementation of their project grant. We anticipate that the Predisaster Mitigation program authorized by section 203 of the Act, 42 U.S.C. 5133, will also support this local mitigation planning by making funds available for the development of comprehensive local mitigation plans. Managing States that we approve under new criteria established under section 404 of the Act, 42 U.S.C. 5170c(c), as amended by section 204 of DMA 2000 will have approval authority for local mitigation plans. This provision does not apply to States that we approved under the Managing State program in effect before enactment of DMA 2000.

Our goal is for State and local governments to develop comprehensive and integrated plans that are coordinated through appropriate State, local, and regional agencies, as well as non-governmental interest groups. To the extent feasible and practicable, we would also like to consolidate the planning requirements for different FEMA mitigation programs. This will ensure that one local plan will meet the minimum requirements for all of the different FEMA mitigation programs, such as the Flood Mitigation Assistance Program (authorized by sections 553 and 554 of the National Flood Insurance Reform Act of 1994, 42 U.S.C. 4104c and 42 U.S.C. 4104d), the Community Rating System (authorized by section 541 of the National Flood Insurance Reform Act of 1994, 42 U.S.C. 4022), the Pre-Disaster Mitigation Program (authorized by section 203 of the Stafford Act), the Hazard Mitigation Grant Program (authorized by section 404 of the Stafford Act), and the mitigation activities that are based upon the provisions of section 323 and subsections 406(b) and (e) of the Stafford Act. The mitigation plans may also serve to integrate documents and plans produced under other emergency management programs. State level plans should identify overall goals and priorities, incorporating the more specific local risk assessments, when available, and including projects identified through the local planning process.

Under section 322(d), up to 7 percent of the available HMGP funds may now be used for planning, and we encourage States to use these funds for local plan development. In a memorandum to FEMA Regional Directors dated December 21, 2000, we announced that this provision of section 322 was effective for disasters declared on or after October 30, 2000, the date on which the Disaster Mitigation Act of 2000 became law. Regional Directors are encouraging States to make these funds immediately available to local and Indian tribal governments, although the funds can be used for plan development and review at the State level as well.

As discussed earlier in this Supplementary Information, subsection 323(a) of the Stafford Act, 42 U.S.C. 5166(a), requires as a precondition to receiving disaster assistance under the Act that State and local governments, as well as eligible private nonprofit entities, must agree to carry out repair and reconstruction activities ''in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications, and standards.'' In addition, that subsection authorizes the President (FEMA, by virtue of Executive Order 12148, as amended) to ''require safe land use and construction practices, after adequate consultation with appropriate State and local officials'' in the course of the use of Federal disaster assistance by eligible applicants to repair and restore disaster-damaged facilities.

At the same time that we implement the planning mandates of section 322 of the Stafford Act, we are also implementing the Minimum Standards for Public and Private Structures provision of section 323 of the Act. This rule appears at Subpart M of Part 206 of Title 44 of the Code of Federal Regulations. As mentioned earlier, the section 322 planning regulations are in Part 201, while Part 206, Subpart M includes only the minimum codes and standards regulations mandated in § 323. The rule to implement § 323 of the Act reinforces the link between pre-disaster planning, building and construction standards, and post-disaster reconstruction efforts.

We encourage comments on this interim final rule, and we will make every effort to involve all interested parties prior to the development of the Final Rule.

Justification for Interim Final Rule

In general, FEMA publishes a rule for public comment before issuing a final rule, under the Administrative Procedure Act, 5 U.S.C. 533 and 44 CFR 1.12. The Administrative Procedure Act, however, provides an exception from that general rule where the agency for good cause finds the procedures for comment and response contrary to public interest. Section 322 of the Stafford Act allows States to receive increased post-disaster grant funding for projects designed to reduce future disaster losses. States will only be eligible for these increased funds if they have a FEMA-approved Enhanced State Mitigation Plan.

This interim final rule provides the criteria for development and approval of these plans, as well as criteria for local mitigation plans required by this legislation. In order for State and local governments to be positioned to receive these mitigation funds as soon as possible, these regulations must be in effect. The public benefit of this rule will be to assist States and communities assess their risks and identify activities to strengthen the larger community and the built environment in order to become less susceptible to disasters. Planning serves as the vital foundation to saving lives and protecting properties, having integrated plans in place can serve to both streamline recovery efforts and lessen potential future damages. Therefore, we believe it is contrary to the public interest to delay

the benefits of this rule. In accordance with the Administrative Procedure Act, 5 U.S.C. 553(d)(3), we find that there is good cause for the interim final rule to take effect immediately upon publication in the **Federal Register** in order to meet the needs of States and communities by identifying criteria for mitigation plans in order to reduce risks nationwide, establish criteria for minimum codes and standards in post-disaster reconstruction, and to allow States to adjust their mitigation plans to receive the increase in mitigation funding.

In addition, we believe that, under the circumstances, delaying the effective date of this rule until after the comment period would not further the public interest. Prior to this rulemaking, FEMA hosted a meeting where interested parties provided comments and suggestions on how we could implement these planning requirements. Participants in this meeting included representatives from the National Emergency Management Association, the Association of State Floodplain Managers, the National Governors' Association, the International Association of Emergency Managers, the National Association of Development Organizations, the American Public Works Association, the National League of Cities, the National Association of Counties, the National Conference of State Legislatures, the International City/County Management Association, and the Bureau of Indian Affairs. We took comments and suggestions provided at this meeting into account in developing this interim final rule. Therefore, we find that prior notice and comment on this rule would not further the public interest. We actively encourage and solicit comments on this interim final rule from interested parties, and we will consider them in preparing the final rule. For these reasons, we believe we have good cause to publish an interim final rule.

National Environmental Policy Act

44 CFR 10.8(d)(2)(ii) excludes this rule from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusion under 44 CFR 10.8(d)(2)(iii), such as the development of plans under this section.

Executive Order 12866, Regulatory Planning and Review

We have prepared and reviewed this rule under the provisions of E.O. 12866, Regulatory Planning and Review. Under Executive Order 12866, 58 FR 51735, October 4, 1993, a significant regulatory action is subject to OMB review and the requirements of the Executive Order. The Executive Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The purpose of this rule is to implement section 322 of the Stafford Act which addresses mitigation planning at the State, tribal, and local levels, identifies new local planning requirements, allows Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. The rule identifies local mitigation planning requirements before approval of project grants, and requires our approval of an Enhanced State Mitigation plan as a condition for increased mitigation funding. The rule also implements section 323 of the Stafford Act, which requires that repairs or construction funded by disaster loans or grants must comply with applicable standards and safe land use and construction practices. As such the rule itself will not have an effect on the economy of more than $100,000,000.

Therefore, this rule is a significant regulatory action and is not an economically significant rule under Executive Order 12866. The Office of Management and Budget (OMB) has reviewed this rule under Executive Order 12866.

Executive Order 12898, Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994, we incorporate environmental justice into our policies and programs. The Executive Order requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that those programs, policies, and activities do not have the effect of excluding persons from participation in our programs, denying persons the benefits of our programs, or subjecting persons to discrimination because of their race, color, or national origin.

No action that we can anticipate under the final rule will have a disproportionately high or adverse human health and environmental effect on any segment of the population. Section 322 focuses specifically on mitigation planning to: Identify the natural hazards, risks, and vulnerabilities of areas in States, localities, and tribal areas; support development of local mitigation plans; provide for technical assistance to local and tribal governments for mitigation planning; and identify and prioritize mitigation actions that the State will support, as resources become available. Section 323 requires compliance with applicable codes and standards in repair and construction, and use of safe land use and construction standards. Accordingly, the requirements of Executive Order 12898 do not apply to this interim final rule.

Paperwork Reduction Act of 1995

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) and concurrent with the publication of this interim final rule, we have submitted a request for review and approval of a new collection of information, which is contained in this interim final rule. Under the Paperwork Reduction Act of 1995, a person may not be penalized for failing to comply with an information collection that does not display a currently valid Office of Management and Budget (OMB) control number. The request was submitted to OMB for approval under the emergency processing procedures in OMB regulation 5 CFR 1320.1. OMB has approved this collection of information for use through August 31, 2002, under OMB Number 3067–0297.

We expect to follow this emergency request with a request for OMB approval to continue the use of the collection of information for a term of three years. The request will be processed under OMB's normal clearance procedures in accordance with provisions of OMB regulation 5 CFR 1320.10. To help us with the timely processing of the emergency and normal clearance submissions to OMB, we invite the general public to comment on the collection of information. This notice and request for comments complies with the provisions of the Paperwork

Reduction Act of 1995 (44 U.S.C. 3506(c)(2)(A)).

Collection of Information

Title: State/Local/Tribal Hazard Mitigation Plans under Section 322 of the Disaster Mitigation Act of 2000.

Abstract: Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act, as amended by Section 104 of the Disaster Mitigation Act of 2000, provides new and revitalized approaches to mitigation planning. To obtain Federal assistance, new planning provisions require that each state, local, and tribal government prepare a hazard mitigation plan to include sections that describe the planning process, an assessment of the risks, a mitigation strategy, and identification of the plan maintenance and updating process. The Act provides a framework for linking pre- and post-disaster mitigation planning and initiatives with public and private interests to ensure an integrated, comprehensive approach to disaster loss reduction. Under Section 322 there is a two-tiered State mitigation plan process. State mitigation plans must be reviewed, revised, and submitted to us every 3 years.

(1) A *Standard State Mitigation Plan* must be approved by us in order for States to be eligible to receive Hazard Mitigation Grant Program (HGMP) funding based on 15 percent of the total estimated eligible Federal disaster assistance. This plan demonstrates the State's goals, priorities, and commitment to reduce risks from natural hazards and serves as a guide for State and local decision makers as they commit resources to reducing the effects of natural hazards.

(2) An *Enhanced State Mitigation Plan* must be approved by us for a State to be eligible to receive HMGP funds based on 20 percent of the total estimated eligible Federal disaster assistance. This plan must be approved by us within the 3 years prior to the current major disaster declaration. It must demonstrate that a State has developed a comprehensive mitigation program, is effectively using available mitigation funding, and is capable of managing the increased funding.

To be eligible to receive HMGP project grants, *local governments* must develop Local Mitigation Plans that include a risk assessment and mitigation strategy to reduce potential losses and target resources. Plans must be reviewed, revised, and submitted to us for approval every 5 years.

To receive HMGP project grants, *tribal governments* may apply as a grantee or subgrantee, and will be required to meet the planning requirements of a State or local government.

Estimated Total Annual Burden:

Type of collection/forms	No. of respondents	Hours per response	Annual burden hours
Update state or tribal mitigation plans (standard state mitigation plans)	18	320	5,760
State review of local plans	500 local plans	8	4,000
States develop Enhanced State Mitigation Plans	7	100	700
Local or tribal governments develop mitigation plans	500 local plans	300	150,000
Total burden			160,460

Comments: We are soliciting written comments to: (a) Evaluate whether the proposed data collection is necessary for the proper performance of the agency, including whether the information shall have practical utility; (b) evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information; (c) obtain recommendations to enhance the quality, utility, and clarity of the information to be collected; and (d) evaluate the extent to which automated, electronic, mechanical, or other technological collection techniques may further reduce the respondents' burden. FEMA will accept comments through April 29, 2002.

Addressee: Interested persons should submit written comments to Muriel B. Anderson, Chief, Records Management Section, Program Services and Systems Branch, Facilities Management and Services Division, Administration and Resource Planning Directorate, Federal Emergency Management Agency, 500 C Street, Street, SW., Washington, DC 20472.

FOR FURTHER INFORMATION CONTACT: You may obtain copies of the OMB paperwork clearance package by contacting Ms. Anderson at (202) 646–2625 (voice), (202) 646–3347 (facsimile), or by e-mail at *muriel.anderson@fema.gov.*

Executive Order 13132, Federalism

Executive Order 13132, Federalism, dated August 4, 1999, sets forth principles and criteria that agencies must adhere to in formulating and implementing policies that have federalism implications, that is, regulations that have substantial direct effects on the States, or on the distribution of power and responsibilities among the various levels of government. Federal agencies must closely examine the statutory authority supporting any action that would limit the policymaking discretion of the States, and to the extent practicable, must consult with State and local officials before implementing any such action.

We have reviewed this rule under E.O.13132 and have concluded that the rule does not have federalism implications as defined by the Executive Order. We have determined that the rule does not significantly affect the rights, roles, and responsibilities of States, and involves no preemption of State law nor does it limit State policymaking discretion.

However, we have consulted with State and local officials. In order to assist us in the development of this rule, we hosted a meeting to allow interested parties an opportunity to provide their perspectives on the legislation and options for implementation of § 322. Stakeholders who attended the meeting included representatives from the National Emergency Management Association, the Association of State Floodplain Managers, the National Governors' Association, the International Association of Emergency Managers, the National Association of Development Organizations, the American Public Works Association, the National League of Cities, the National Association of Counties, the National Conference of State Legislatures, the International City/County Management Association, and the Bureau of Indian Affairs. We received valuable input from all parties at the meeting, which we took into account in the development of this rule. Additionally, we actively encourage and solicit comments on this interim final rule from interested parties, and we will

consider them in preparing the final rule.

Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

We have reviewed this interim final rule under Executive Order 13175, which became effective on February 6, 2001. Under the Hazard Mitigation Grant Program (HMGP), Indian tribal governments will have the option to apply for grants directly to us and to serve as ''grantee'', carrying out ''State'' roles. If they choose this option, tribal governments may submit either a State-level Standard Mitigation Plan for the 15 percent HMGP funding or a State-level Enhanced Mitigation Plan for 20 percent HMGP funding. In either case, Indian tribal governments would be able to spend up to 7 percent of those funds on planning. Before developing this rule, we met with representatives from State and local governments and the Bureau of Indian Affairs, to discuss the new planning opportunities and requirements of § 322 of the Stafford Act. We received valuable input from all parties, which helped us to develop this interim final rule.

In reviewing the interim final rule, we find that it does not have ''tribal implications'' as defined in Executive Order 13175 because it will not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes. Moreover, the interim final rule does not impose substantial direct compliance costs on tribal governments, nor does it preempt tribal law, impair treaty rights or limit the self-governing powers of tribal governments.

Congressional Review of Agency Rulemaking

We have sent this interim final rule to the Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, Public Law 104–121. The rule is a not ''major rule'' within the meaning of that Act. It is an administrative action in support of normal day-to-day mitigation planning activities required by section 322 and compliance under section 323 of the Stafford Act, as enacted in DMA 2000.

The rule will not result in a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have ''significant adverse effects'' on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises. This final rule is subject to the information collection requirements of the Paperwork Reduction Act, and OMB has assigned Control No. 3067–0297. The rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Public Law 104–4, and any enforceable duties that we impose are a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Part 201 and Part 206

Administrative practice and procedure, Disaster assistance, Grant programs, Mitigation planning, Reporting and recordkeeping requirements.

Accordingly, Amend 44 CFR, Subchapter D—Disaster Assistance, as follows:

1. Add Part 201 to read as follows:

PART 201—MITIGATION PLANNING

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

§ 201.1 Purpose.

(a) The purpose of this part is to provide information on the polices and procedures for mitigation planning as required by the provisions of section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

§ 201.2 Definitions.

Grantee means the government to which a grant is awarded, which is accountable for the use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the grantee. However, after a declaration, an Indian tribal government may choose to be a grantee, or may act as a subgrantee under the State. An Indian tribal government acting as grantee will assume the responsibilities of a ''state'', as described in this part, for the purposes of administering the grant.

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Hazard Mitigation Grant Program means the program authorized under section 404 of the Stafford Act, 42 U.S.C 5170c and implemented at 44 CFR Part 206, Subpart N, which authorizes funding for certain mitigation measures identified through the evaluation of natural hazards conducted under section 322 of the Stafford Act 42 U.S.C 5165.

Indian tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local government is any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Managing State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c). FEMA may also delegate authority to tribal governments to administer and manage the HMGP as a Managing State.

Regional Director is a director of a regional office of FEMA, or his/her designated representative.

Small and impoverished communities means a community of 3,000 or fewer individuals that is identified by the State as a rural community, and is not a remote area within the corporate boundaries of a larger city; is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80 percent of national, per capita income, based on

best available data; the local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate; and any other factors identified in the State Plan in which the community is located.

The Stafford Act refers to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93–288, as amended (42 U.S.C. 5121–5206).

State is any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

State Hazard Mitigation Officer is the official representative of State government who is the primary point of contact with FEMA, other Federal agencies, and local governments in mitigation planning and implementation of mitigation programs and activities required under the Stafford Act.

Subgrantee means the government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-profit organizations, or Indian tribal government. Indian tribal governments acting as a subgrantee are accountable to the State grantee.

§ 201.3 Responsibilities.

(a) *General.* This section identifies the key responsibilities of FEMA, States, and local/tribal governments in carrying out section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) *FEMA.* The key responsibilities of the Regional Director are to:

(1) Oversee all FEMA related pre- and post-disaster hazard mitigation programs and activities;

(2) Provide technical assistance and training to State, local, and Indian tribal governments regarding the mitigation planning process;

(3) Review and approve all Standard and Enhanced State Mitigation Plans;

(4) Review and approve all local mitigation plans, unless that authority has been delegated to the State in accordance with § 201.6(d);

(5) Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled, and when necessary, take action, including recovery of funds or denial of future funds, if mitigation commitments are not fulfilled.

(c) *State.* The key responsibilities of the State are to coordinate all State and local activities relating to hazard evaluation and mitigation and to:

(1) Prepare and submit to FEMA a Standard State Mitigation Plan following the criteria established in § 201.4 as a condition of receiving Stafford Act assistance (except emergency assistance).

(2) In order to be considered for the 20 percent HMGP funding, prepare and submit an Enhanced State Mitigation Plan in accordance with § 201.5, which must be reviewed and updated, if necessary, every three years from the date of the approval of the previous plan.

(3) At a minimum, review and, if necessary, update the Standard State Mitigation Plan by November 1, 2003 and every three years from the date of the approval of the previous plan in order to continue program eligibility.

(4) Make available the use of up to the 7 percent of HMGP funding for planning in accordance with § 206.434.

(5) Provide technical assistance and training to local governments to assist them in applying for HMGP planning grants, and in developing local mitigation plans.

(6) For Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c), review and approve local mitigation plans in accordance with § 201.6(d).

(d) *Local governments.* The key responsibilities of local governments are to:

(1) Prepare and adopt a jurisdiction-wide natural hazard mitigation plan as a condition of receiving project grant funds under the HMGP, in accordance with § 201.6.

(2) At a minimum, review and, if necessary, update the local mitigation plan every five years from date of plan approval to continue program eligibility.

(e) *Indian tribal governments.* Indian tribal governments will be given the option of applying directly to us for Hazard Mitigation Grant Program funding, or they may choose to apply through the State. If they apply directly to us, they will assume the responsibilities of the State, or grantee, and if they apply through the State, they will assume the responsibilities of the local government, or subgrantee.

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* By November 1, 2003, States must have an approved Standard State Mitigation plan meeting the requirements of this section, in order to receive assistance under the Stafford Act, although assistance authorized under disasters declared prior to November 1, 2003 will continue to be made available. In any case, emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards. States may choose to include the requirements of the HMGP Administrative Plan in their mitigation plan.

(b) *Planning process.* An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups, and be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

(c) *Plan content.* To be effective the plan must include the following elements:

(1) Description of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

(2) *Risk assessments* that provide the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments. The risk assessment shall include the following:

(i) An overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate;

(ii) An overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the

identified hazard areas shall also be addressed;

(iii) An overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

(3) A *Mitigation Strategy* that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:

(i) A description of State goals to guide the selection of activities to mitigate and reduce potential losses.

(ii) A discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of State funding capabilities for hazard mitigation projects; and a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

(iii) An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.

(iv) Identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

(4) A section on the *Coordination of Local Mitigation Planning* that includes the following:

(i) A description of the State process to support, through funding and technical assistance, the development of local mitigation plans.

(ii) A description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.

(iii) Criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

(5) A *Plan Maintenance Process* that includes:

(i) An established method and schedule for monitoring, evaluating, and updating the plan.

(ii) A system for monitoring implementation of mitigation measures and project closeouts.

(iii) A system for reviewing progress on achieving goals as well as activities and projects identified in the Mitigation Strategy.

(6) A *Plan Adoption Process.* The plan must be formally adopted by the State prior to submittal to us for final review and approval.

(7) *Assurances.* The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

(d) *Review and updates.* Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible. We also encourage a State to review its plan in the post-disaster timeframe to reflect changing priorities, but it is not required.

§ 201.5 Enhanced State Mitigation Plans.

(a) A State with a FEMA approved Enhanced State Mitigation Plan at the time of a disaster declaration is eligible to receive increased funds under the HMGP, based on twenty percent of the total estimated eligible Stafford Act disaster assistance. The Enhanced State Mitigation Plan must demonstrate that a State has developed a comprehensive mitigation program, that the State effectively uses available mitigation funding, and that it is capable of managing the increased funding. In order for the State to be eligible for the 20 percent HMGP funding, FEMA must have approved the plan within three years prior to the disaster declaration.

(b) Enhanced State Mitigation Plans must include all elements of the Standard State Mitigation Plan identified in § 201.4, as well as document the following:

(1) Demonstration that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.

(2) Documentation of the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:

(i) Established eligibility criteria for multi-hazard mitigation measures.

(ii) A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A–94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, and to rank the measures according to the State's eligibility criteria.

(iii) Demonstration that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, including a record of the following:

(A) Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;

(B) Preparing and submitting accurate environmental reviews and benefit-cost analyses;

(C) Submitting complete and accurate quarterly progress and financial reports on time; and

(D) Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.

(iv) A system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.

(3) Demonstration that the State effectively uses existing mitigation programs to achieve its mitigation goals.

(4) Demonstration that the State is committed to a comprehensive state mitigation program, which might include any of the following:

(i) A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.

(ii) A statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private

partnerships, and/or other executive actions that promote hazard mitigation.

(iii) The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.

(iv) To the extent allowed by State law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.

(v) A comprehensive, multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery operations.

(vi) A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.

(c) *Review and updates.* (1) A State must review and revise its plan to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities, and resubmit it for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(2) In order for a State to be eligible for the 20 percent HMGP funding, the Enhanced State Mitigation plan must be approved by FEMA within the three years prior to the current major disaster declaration.

§ 201.6 Local Mitigation Plans.

The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

(a) *Plan requirement.* (1) For disasters declared after November 1, 2003, a local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. Until November 1, 2003, local mitigation plans may be developed concurrent with the implementation of the project grant.

(2) Regional Directors may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(3) Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

(b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for 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 to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

(c) *Plan content.* The plan shall include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

(2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;

(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

(3) *A mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

(iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

(iii) Discussion on how the community will continue public participation in the plan maintenance process.

(5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

(d) *Plan review.* (1) Plans must be submitted to the State Hazard Mitigation Officer for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval.

(2) The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(3) Plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for HMGP project grant funding.

(4) Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c) will be delegated approval authority for local mitigation plans, and the review will be based on the criteria in this part. Managing States will review the plans within 45 days of receipt of the plans, whenever possible, and provide a copy of the approved plans to the Regional Office.

PART 206—FEDERAL DISASTER ASSISTANCE FOR DISASTERS DECLARED ON OR AFTER NOVEMBER 23, 1988

2. The authority citation for part 206 is revised to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

2a. Revise Part 206, Subpart M to read as follows:

Subpart M—Minimum Standards

Sec.
206.400 General.
206.401 Local standards.
206.402 Compliance.

§ 206.400 General.

(a) As a condition of the receipt of any disaster assistance under the Stafford Act, the applicant shall carry out any repair or construction to be financed with the disaster assistance in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications and standards.

(b) Applicable codes, specifications, and standards shall include any disaster resistant building code that meets the minimum requirements of the National Flood Insurance Program (NFIP) as well as being substantially equivalent to the recommended provisions of the National Earthquake Hazards Reduction Program (NEHRP). In addition, the applicant shall comply with any requirements necessary in regards to Executive Order 11988, Floodplain Management, Executive Order 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction, and any other applicable Executive orders.

(c) In situations where there are no locally applicable standards of safety, decency and sanitation, or where there are no applicable local codes, specifications and standards governing repair or construction activities, or where the Regional Director determines that otherwise applicable codes, specifications, and standards are inadequate, then the Regional Director may, after consultation with appropriate State and local officials, require the use of nationally applicable codes, specifications, and standards, as well as safe land use and construction practices in the course of repair or construction activities.

(d) The mitigation planning process that is mandated by section 322 of the Stafford Act and 44 CFR part 201 can assist State and local governments in determining where codes, specifications, and standards are inadequate, and may need to be upgraded.

§ 206.401 Local standards.

The cost of repairing or constructing a facility in conformity with minimum codes, specifications and standards may be eligible for reimbursement under section 406 of the Stafford Act, as long as such codes, specifications and standards meet the criteria that are listed at 44 CFR 206.226(b).

§ 206.402 Compliance.

A recipient of disaster assistance under the Stafford Act must document for the Regional Director its compliance with this subpart following the completion of any repair or construction activities.

Subpart N—Hazard Mitigation Grant Program

3. Revise § 206.431 to read as follows:

§ 206.431 Definitions.

Activity means any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

Applicant means a State agency, local government, Indian tribal government, or eligible private nonprofit organization, submitting an application to the grantee for assistance under the HMGP.

Enhanced State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201 as a condition of receiving increased funding under the HMGP.

Grant application means the request to FEMA for HMGP funding, as outlined in § 206.436, by a State or tribal government that will act as grantee.

Grant award means total of Federal and non-Federal contributions to complete the approved scope of work.

Grantee means the government to which a grant is awarded and which is accountable for the use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the grantee. However, an Indian tribal government may choose to be a grantee, or it may act as a subgrantee under the State. An Indian tribal government acting as a grantee will assume the responsibilities of a ''state'', under this subpart, for the purposes of administering the grant.

Indian tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local Mitigation Plan is the hazard mitigation plan required of a local or Indian tribal government acting as a subgrantee as a condition of receiving a project subgrant under the HMGP as outlined in 44 CFR 201.6.

Standard State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201, as a condition of receiving Stafford Act assistance as outlined in § 201.4.

State Administrative Plan for the Hazard Mitigation Grant Program means the plan developed by the State to describe the procedures for administration of the HMGP.

Subgrant means an award of financial assistance under a grant by a grantee to an eligible subgrantee.

Subgrant application means the request to the grantee for HMGP funding by the eligible subgrantee, as outlined in § 206.436.

Subgrantee means the government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-profit organizations, or Indian tribal government as outlined in § 206.433.

Indian tribal governments acting as a subgrantee are accountable to the State grantee.

4. Revise § 206.432(b) to read as follows:

§ 206.432 Federal grant assistance.

* * * * *

(b) *Amounts of assistance.* The total of Federal assistance under this subpart shall not exceed either 15 or 20 percent of the total estimated Federal assistance (excluding administrative costs) provided for a major disaster under 42 U.S.C. 5170b, 5172, 5173, 5174, 5177, 5178, 5183, and 5201 as follows:

(1) *Fifteen (15) percent.* Effective November 1, 2003, a State with an approved Standard State Mitigation Plan, which meets the requirements outlined in 44 CFR 201.4, shall be eligible for assistance under the HMGP not to exceed 15 percent of the total estimated Federal assistance described in this paragraph. Until that date, existing, approved State Mitigation Plans will be accepted.

(2) *Twenty (20) percent.* A State with an approved Enhanced State Mitigation Plan, in effect prior to the disaster declaration, which meets the requirements outlined in 44 CFR 201.5 shall be eligible for assistance under the HMGP not to exceed 20 percent of the total estimated Federal assistance described in this paragraph.

(3) The estimates of Federal assistance under this paragraph (b) shall be based on the Regional Director's estimate of all eligible costs, actual grants, and appropriate mission assignments.

* * * * *

5. Section 206.434 is amended by redesignating paragraphs (b) through (g) as paragraphs (c) through (h), respectively; adding a new paragraph (b); revising redesignated paragraphs (c) introductory text and (c)(1); and revising redesignated paragraph (d) to read as follows:

§ 206.434 Eligibility.

* * * * *

(b) *Plan requirement.* (1) For all disasters declared on or after November 1, 2003, local and tribal government applicants for subgrants, must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of HMGP subgrant funding. Until November 1, 2003, local mitigation plans may be developed concurrent with the implementation of subgrants.

(2) Regional Directors may grant an exception to this requirement in extraordinary circumstances, such as in a small and impoverished community when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(c) *Minimum project criteria.* To be eligible for the Hazard Mitigation Grant Program, a project must:

(1) Be in conformance with the State Mitigation Plan and Local Mitigation Plan approved under 44 CFR part 201;

* * * * *

(d) *Eligible activities.* (1) *Planning.* Up to 7% of the State's HMGP grant may be used to develop State, tribal and/or local mitigation plans to meet the planning criteria outlined in 44 CFR part 201.

(2) *Types of projects.* Projects may be of any nature that will result in protection to public or private property. Eligible projects include, but are not limited to:

(i) Structural hazard control or protection projects;

(ii) Construction activities that will result in protection from hazards;

(iii) Retrofitting of facilities;

(iv) Property acquisition or relocation, as defined in paragraph (e) of this section;

(v) Development of State or local mitigation standards;

(vi) Development of comprehensive mitigation programs with implementation as an essential component;

(vii) Development or improvement of warning systems.

* * * * *

6. Revise § 206.435(a) to read as follows:

§ 206.435 Project identificaiton and selection criteria.

(a) *Identification.* It is the State's responsibility to identify and select eligible hazard mitigation projects. All funded projects must be consistent with the State Mitigation Plan. Hazard Mitigation projects shall be identified and prioritized through the State, Indian tribal, and local planning process.

* * * * *

7. Revise § 206.436 to read as follows:

§ 206.436 Application procedures.

(a) *General.* This section describes the procedures to be used by the grantee in submitting an application for HMGP funding. Under the HMGP, the State or Indian tribal government is the grantee and is responsible for processing subgrants to applicants in accordance with 44 CFR part 13 and this part 206. Subgrantees are accountable to the grantee.

(b) *Governor's Authorized Representative.* The Governor's Authorized Representative serves as the grant administrator for all funds provided under the Hazard Mitigation Grant Program. The Governor's Authorized Representative's responsibilities as they pertain to procedures outlined in this section include providing technical advice and assistance to eligible subgrantees, and ensuring that all potential applicants are aware of assistance available and submission of those documents necessary for grant award.

(c) *Hazard mitigation application.* Upon identification of mitigation measures, the State (Governor's Authorized Representative) will submit its Hazard Mitigation Grant Program application to the FEMA Regional Director. The application will identify one or more mitigation measures for which funding is requested. The application must include a Standard Form (SF) 424, Application for Federal Assistance, SF 424D, Assurances for Construction Programs, if appropriate, and an narrative statement. The narrative statement will contain any pertinent project management information not included in the State's administrative plan for Hazard Mitigation. The narrative statement will also serve to identify the specific mitigation measures for which funding is requested. Information required for each mitigation measure shall include the following:

(1) Name of the subgrantee, if any;

(2) State or local contact for the measure;

(3) Location of the project;

(4) Description of the measure;

(5) Cost estimate for the measure;

(6) Analysis of the measure's cost-effectiveness and substantial risk reduction, consistent with § 206.434(c);

(7) Work schedule;

(8) Justification for selection;

(9) Alternatives considered;

(10) Environmental information consistent with 44 CFR part 9, Floodplain Management and Protection of Wetlands, and 44 CFR part 10, Environmental Considerations.

(d) *Application submission time limit.* The State's application may be amended as the State identifies and selects local project applications to be funded. The State must submit all local HMGP applications and funding requests for the purpose of identifying new projects to the Regional Director within 12 months of the date of disaster declaration.

(e) *Extensions.* The State may request the Regional Director to extend the application time limit by 30 to 90 day

increments, not to exceed a total of 180 days. The grantee must include a justification in its request.

(f) *FEMA approval.* The application and supplement(s) will be submitted to the FEMA Regional Director for approval. FEMA has final approval authority for funding of all projects.

(g) *Indian tribal grantees.* Indian tribal governments may submit a SF 424 directly to the Regional Director.

Subpart H—Public Assistance Eligibility

* * * * *

8. Revise § 206.220 to read as follows:

§ 206.220 General.

This subpart provides policies and procedures for determinations of eligibility of applicants for public assistance, eligibility of work, and eligibility of costs for assistance under sections 402, 403, 406, 407, 418, 419, 421(d), 502, and 503 of the Stafford Act. Assistance under this subpart must also conform to requirements of 44 CFR part 201, Mitigation Planning, and 44 CFR part 206, subparts G—Public Assistance Project Administration, I—Public Assistance Insurance Requirements, J—Coastal Barrier Resources Act, and M—Minimum Standards. Regulations under 44 CFR part 9—Floodplain Management and 44 CFR part 10—Environmental Considerations, also apply to this assistance.

9. Section 206.226 is amended by redesignating paragraphs

(b) through (j) as paragraphs (c) through (k), respectively; adding a new paragraph (b); and revising redesignated paragraph (g)(5) to read as follows:

§ 206.226 Restoration of damaged facilities.

* * * * *

(b) *Mitigation planning.* In order to receive assistance under this section, as of November 1, 2003, the State must have in place a FEMA approved State Mitigation Plan in accordance with 44 CFR part 201.

* * * * *

(g) * * *

(5) If relocation of a facility is not feasible or cost effective, the Regional Director shall disapprove Federal funding for the original location when he/she determines in accordance with 44 CFR parts 9, 10, 201, or subpart M of this part 206, that restoration in the original location is not allowed. In such cases, an alternative project may be applied for.

* * * * *

Dated: February 19, 2002.

Michael D. Brown,

General Counsel.

[FR Doc. 02–4321 Filed 2–25–02; 8:45 am]

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APPENDIX B

Terms and Definitions
References

Terms and Definitions:

ESDA - Champaign County Emergency Services Disaster Agency
FEMA - Federal Emergency Management Agency
IEMA - Illinois Emergency Management Agency
NFIP – National Flood Insurance Program
USGS - United States Geology Survey

Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year. The base flood is also known as the one-hundred-year flood.

BOCA (Building Officials and Code Administrators International, Inc.): The professional association representing the full spectrum of code enforcement disciplines and construction industry interests. BOCA is the premier publishers of model codes.

CRS (Community Rating System): The National Flood Insurance Program's (NFIP) Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards.

FIRM (Flood Insurance Rate Map): The official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

Flood Insurance Study: The official report in which the Federal Insurance Administration has provided flood profiles, as well as the flood boundary-floodway map and the water surface elevation of the base flood. The flood insurance study consists of the flood boundary-floodway map, the flood insurance rate map and a technical narrative.

Mitigation: Sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects.

Mobile Home Park (Manufactured Home Park, Manufactured Home Subdivision): A parcel of land divided into two or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lot on which the manufactured home is to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed before the effective date of this article. Manufactured Home (Prefabricated Building) is a structure that is transportable in one or more sections, built on a permanent chassis, and designed to be used with or without a permanent foundation when connected to the required utilities.

Special Flood Hazard Area (SFHA): Those lands within the jurisdiction of the city that are subject to inundation by the base flood. The SFHA's of the city are generally identified as such on the Flood Insurance Rate Map of the city prepared by the Federal

Insurance Administration and dated January 16, 1981, as amended, and the Flood Insurance Rate Map of the County of Champaign, dated March 1, 1984.

Shelter: A space where people can survive a tornado or hurricane with little or no injury. Shelter must be adequately anchored to the house foundation to resist overturning and uplift. The connections between all parts of the shelter must be strong enough to resist failure, and the walls, roof, and door must resist penetration by windborne missiles. A shelter located inside the house can be called a “Safe Room”.

URM (Unreinforced Masonry): Unreinforced masonry (URM) buildings consist of structures in which there is no steel reinforcing within a masonry wall. Some cities classify unreinforced infill walls within a reinforced frame as a URM, while others classify unreinforced exterior veneers on to a wood frame as URMs.

References:

Baxley Media Group, *Inland Wind Resistant Construction* (Video), City of Urbana

Champaign County 1997, *Hazard Mitigation Plan,* Champaign County Department of Planning and Zoning and Emergency Services and Disaster Agency (ESDA), Champaign, Illinois.

City of Urbana 2001, *2002 Comprehensive Plan Update - Existing Conditions Report*, City of Urbana, Illinois.

City of Urbana Public Works Department 2001, *Overhead to Underground Utility Conversion*, City of Urbana, Illinois.

City of Tulsa 1994, *From Rooftop to River: Tulsa's Approach to Floodplain and Stormwater Management,* City of Tulsa, Oklahoma.

Department of Regional Development and Environment, Executive Secretariat for Economic and Social Affairs, General Secretariat of the Organization of American States (with support from OFDA, USAID) 1991, *Primer on Natural Hazard Management in Integrated Regional Development Planning*, Washington D.C.

FEMA 2000, *Interagency Hazard Mitigation Team Report: Long-term hazard mitigation alternatives and funding sources for State and local Governments*, FEMA-1296-DR-NY.

FEMA 2000, *Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability*, FEMA 364 (http://www.fema.gov/mit/planning_toc.htm).

FEMA 1999, *Taking Shelter From the Storm: Building a Safe Room Inside Your House,* FEMA 320 (*http://www.fema.gov/mit/tsfs01.htm*)

FEMA 1997,*Multi Hazard Identification and Risk Assessment- A Cornerstone of the* National Mitigation Strategy, FEMA (*http://www.fema.gov/mit/tsd/ft_mhira.htm*)

FEMA 1996, *Hazard Mitigation Strategy Report and Planning Guidance,* FEMA-1110-DR-IL

FEMA 1993, *Emergency Management Guide for Business & Industry*, FEMA

FEMA 1980, Flood Insurance Study, Urbana, FEMA

Fox, Paul, FEMA and Al Goodman, Mississippi Emergency Management Agency, January 2002, Volume XXVI, Number 3, *A Safe Place to Go (On the Line): The Mississippi Safe Room-Storm Shelter Initiative,* Natural Hazards Observer, Boulder, Colorado.

Hauer, Richard J., Mary C. Hruska, and Jeffrey O. Dawson, 1994, *Trees and ice storms: The development of ice storm–resistant urban tree populations,* Special Publication 94-1, Department of Forestry, University of Illinois at Urbana- Champaign. Urbana, Illinois.

Illinois Department of Natural Resources 1996, *Floodplain Management: Local Floodplain Administrator's Manual,* Illinois Department of Natural Resources, Springfield, Illinois.

IEMA 1997, *Model Hazard Mitigation Plan Handbook,* IEMA

Morris, Marya 1997, *Subdivision Design in Flood Hazard Areas,* Planning Advisory Service (PAS) Report Number 473, American Planning Association, Chicago, Illinois.

Wu, Yueming 2001, *Seismic Risk Assessment for Typical Communities in mid-America* (unpublished doctorate dissertation), Department of Urban and Regional Planning, University of Illinois, Champaign, Illinois.

Websites:

All hazards
University of Colorado/ Natural Hazards Observer
www.colorado.edu/hazards

Tornado
General information about the nature of tornadoes is on
http://205.156.54.206/om/brochures/tornado.htm
http://www.tornadoproject.com/alltorns/iltorn1.htm#C has history of tornadoes by state and county.
http://ww2010.atmos.uiuc.edu/(Gh)/arch/cases/960419/nxrd/urb.rxml has some maps for Illinois.
http://www.crh.noaa.gov/ilx/torstats.htm
http://www.disastercenter.com/illinois/tornado.html
http://www.nssl.noaa.gov/~brooks/essays/mobilehome.html has information on vulnerability of mobile homes.
BOCA international - www.bocai.org

Winter/ice storms
http://www.sws.uiuc.edu/atmos/statecli/winter.htm
http://il.water.usgs.gov/nwis-w/IL/data.components/nmdmap.cgi?statnum=03337000

Floods
Association of Floodplain Managers - www.floods.org
Illinois Home Study Course - www.illinoisfloods.org
For stream flow data
http://water.usgs.gov/il/nwis/discharge?site_no=03337000&agency_cd=USGS&format=gif

Earthquake
About magnitude – intensity comparison of earthquake
http://www.neic.cr.usgs.gov/neis/general/handouts/mag_vs_int.html

Examples

North Carolina Mitigation Plan -
http://www.dem.dcc.state.nc.us/mitigation/home_protection.htm#flood

Ice storm mitigation – Canada -
http://www.electricityforum.com/et/May99/ice.html