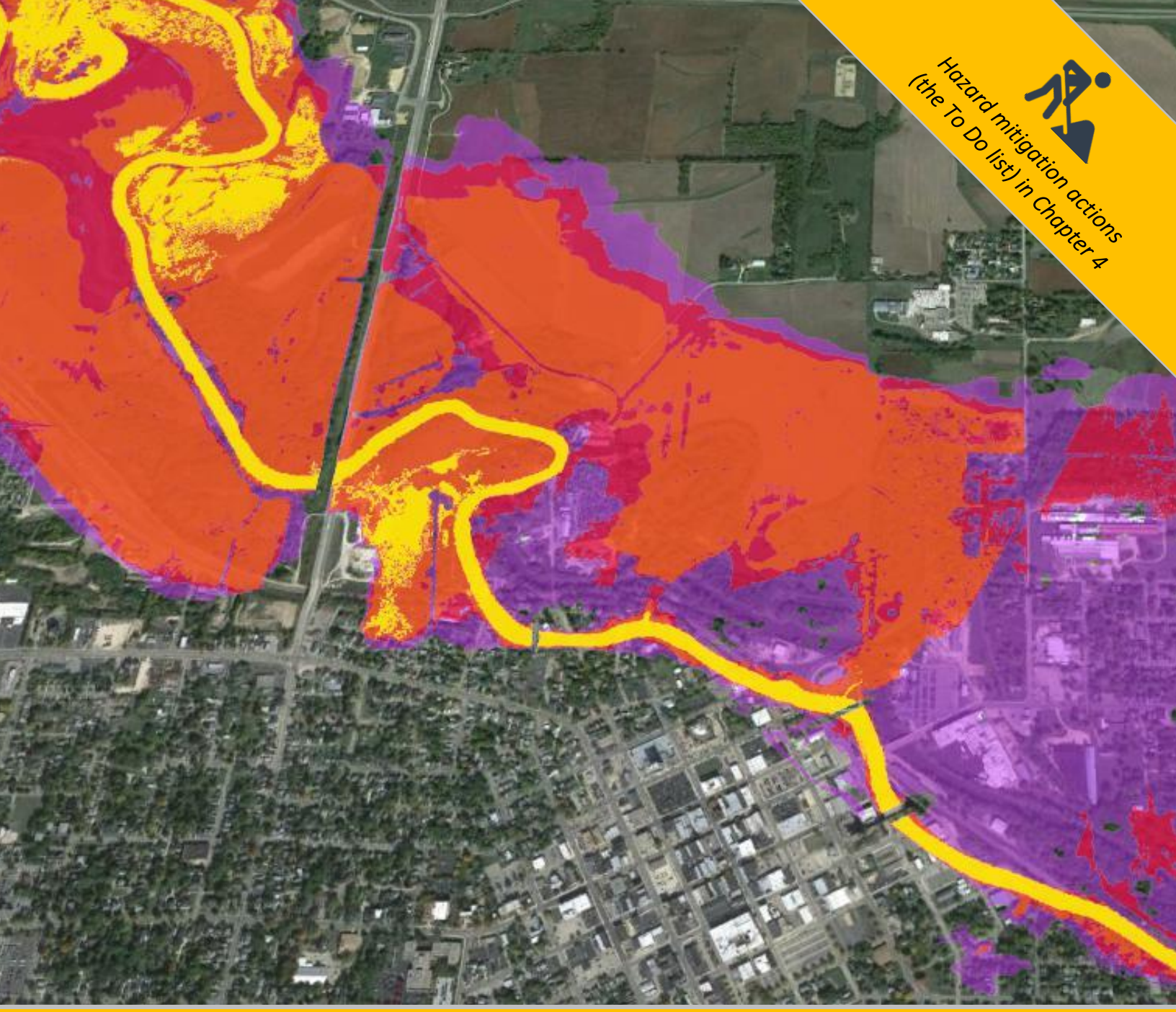


2016-2021

STEPHENSON COUNTY

MULTI-HAZARD MITIGATION PLAN

This update to the 2008 plan was funded by an Illinois Emergency Management Agency (IEMA) grant awarded to the City of Freeport and created by and for the municipalities and unincorporated areas of Stephenson County. It expires in 2021; annual maintenance is prescribed in Chapter 5.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Photo 1: June 2014 damage to utility poles and trees in rural Lena resulting from straight-line wind and microburst activity – source: SCEMA

Hazard mitigation planning provides communities and local jurisdictions opportunities to develop hazard awareness, specify mitigation strategies, and implement projects and programs that reduce vulnerability and risk. This latest five-year plan, covering 2016 to 2021, refines the goals and objectives developed in 2008. It calls for specific actions by hazard and jurisdiction; each action is assigned a priority from low to high. The planning committee recognizes that some goals (and particular actions) may be unachievable in the five-year timeframe. Thus, certain actions are included – in part – to better direct long-term planning efforts.

GOALS FOR 2016-2021

Actions relate to larger objectives; objectives relate to overarching goals, chief among which is the *preservation of life*, followed by (in no particular order):

- Protection of critical facilities, infrastructure, and environmental health
- Improvement of planning and regulatory practices
- Promotion of individual and community resiliency
- Encouragement of communication and development of relationships

HIGHLIGHTED COUNTYWIDE ACTIONS FOR 2016-2021

This document focuses on actions that support emergency management's ability to alert the public, including the deployment of a countywide warning system of sirens to announce inclement weather. Additional actions include working with local communities to help them achieve StormReady Certification, as well as developing and distributing educational materials to residents and businesses within the county. Moreover, there remains interest in installing additional streamgages to record the rise and fall of the Pecatonica River and Yellow Creek.

HIGHLIGHTED INDIVIDUAL JURISDICTION ACTIONS FOR 2016-2021

Population 25,000 or Greater

Freeport, Stephenson County's largest municipality, has lately emphasized stormwater infrastructure investments (e.g., improved street, curb, gutter, and pipe systems) and will continue to make investments in the coming years, in part to better manage water during flooding and severe thunderstorm events. The city is also interested in non-traditional/natural methods of water detention and retention (including multi-hectare water storage systems in restored wetlands within/beyond municipal limits). Further, officials are engaged in blight reduction, which connects to hazard mitigation by addressing properties that are typically impacted by flooding, especially along the Pecatonica River. Acquisition of blighted properties (especially in the floodway/floodplain) will remain critical, with the process expected to be slow but steady. Property acquisition will continue to be based on the voluntary cooperation of individuals and organizations.

A common theme among Stephenson County stakeholders is implementation. While there is recognition that high cost, high benefit actions should take precedence (such as reconditioning and protecting existing water supply and wastewater treatment systems), there is the sense that implementing highly visible, low cost, high benefit projects and programs is important. Accomplishments related to "low-hanging fruit," it is felt, might encourage community support to form around various large-scale investments of time and money. This approach may be important in an era when popular perceptions of institutions and government (in particular, the State of Illinois, which provides aid) are less than favorable.

Population Less than 25,000

Due to dwindling or stagnant municipal resources, emphasis in rural communities is placed on ongoing maintenance and cost avoidance. Yet, certain types of hazard mitigation actions remain desirable and doable. For example, communities with bridges still wish to see debris around piers removed. Waterway bottlenecks, as well as undredged waterbodies, present issues that local officials and the public would like to see addressed. As such, some bottleneck/water flow studies (targeting areas around bridges, culverts, etc.) are included in the plan.

In municipalities with extensive floodway/floodplain (as a percentage of total incorporated land), there is desire to pursue mitigation actions that support both public safety/health and economic opportunity. For the few municipalities with critical facilities remaining in the floodplain, floodproofing or relocation remains a priority. Smaller (but still costly) projects for villages under 25,000 include the installation of backup generators for water/wastewater systems, the acquisition of warning sirens, and investment in sheltering facilities.

TAKING ACTION, INTERWEAVING PLANS

In Stephenson County, there are significant individual and organizational misgivings with respect to planning. Some contemporary apprehension and lack of engagement is caused by the failure to implement projects and programs following previous planning efforts. In addition, existing plans – great in numbers – have not always referenced one another. Lack of formal linkages has sometimes proved a source of frustration.

While other factors are at play (notably, the lack of available financial resources, staff turnover, and declining/stagnant development), the resulting fatigue, not specific to hazard mitigation planning, has sometimes impacted implementation negatively. Even so, for mitigation strategies to come to life and for goals to be met, projects and programs must be implemented and the plan itself must be connected to other plans.

With respect to implementation, it is recommended that Stephenson County officials (both elected and staff) and stakeholders (both local and countywide):

- Take on smaller projects that are both visible (to the public) and have measurable outcomes (not just outputs)
- Let smaller projects be gateways to larger projects and organizing efforts
- Consider the hazard mitigation plan's relationship to other plans (and vice-versa)
- Review plans of yesteryear and, if possible, connect them to contemporary and future planning efforts
- Reference hazard mitigation goals and actions when debating the merits of new projects and programs

SUMMARY BY CHAPTER

Chapter 1: Planning

Hazard mitigation planning is defined and its benefits are explained. The local planning process is covered, including how the plan update was prepared and who was involved. Information is provided about planning committee membership, stakeholder participation, and public involvement (such as open attendance/participation at committee meetings, meetings by jurisdiction, and a countywide survey of residents and workers). Outreach to adjacent jurisdictions and government agencies (local, state, and federal) is accounted for, and plans, studies, reports, and technical data used to prepare the document are noted.

Chapter 2: Planning Context

Such context includes background on geography, features, demographics, utilities, and employment/industry. Transportation/other infrastructure and emergency services are also addressed.

Chapter 3: Capabilities, Hazard ID, & Risk Assessment

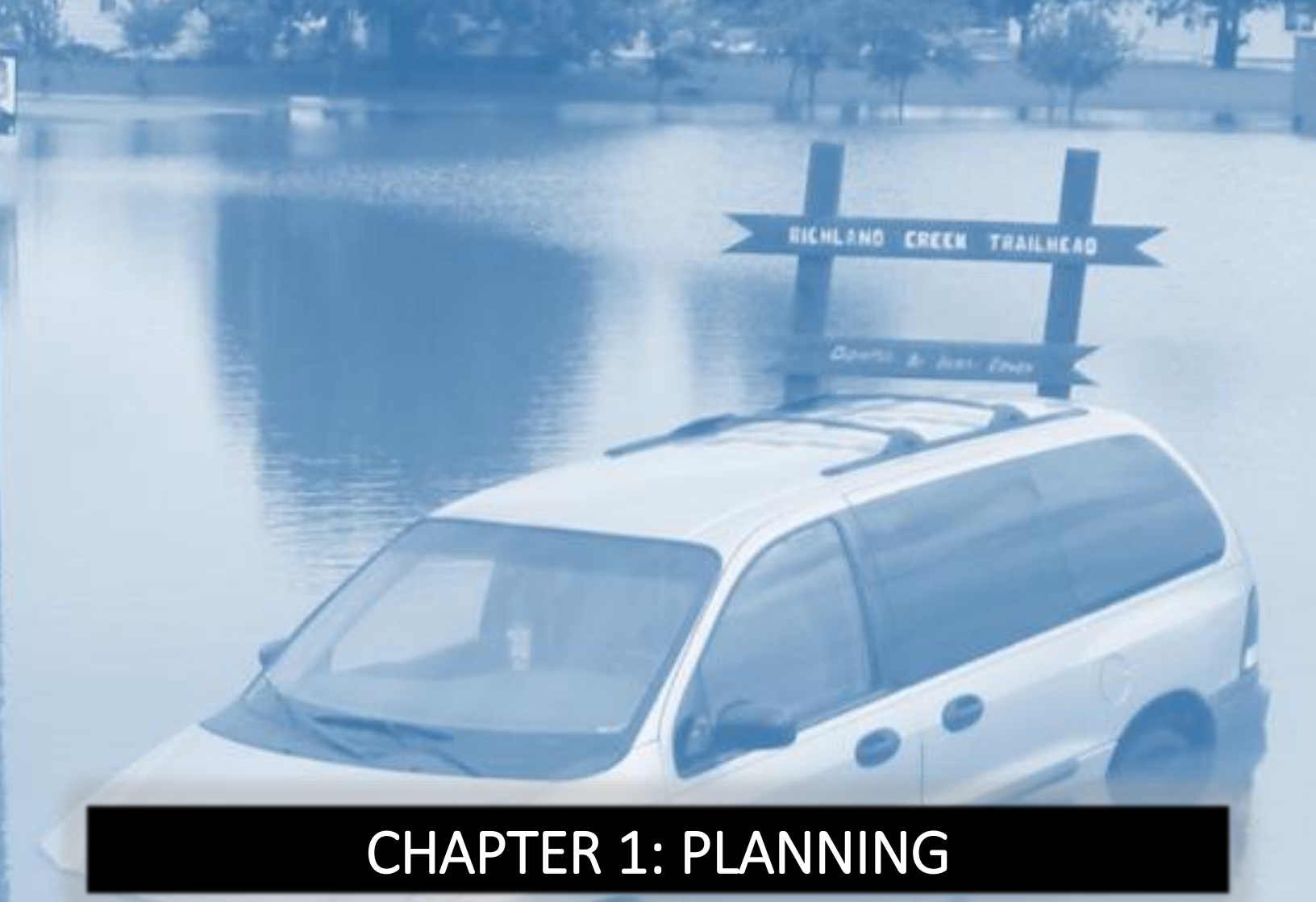
Capabilities by community are listed (including existing authorities, policies, programs, and resources), and the ability to expand on/improve on them is considered. Hazard profiles, which explain the type, location, and extent of all natural hazards that can effect each jurisdiction, are provided. The probability of hazard occurrence is analyzed by hazard (with historic events listed in Appendix D). The impacts of identified hazards are reviewed and vulnerabilities for each jurisdiction are discussed and illustrated using maps. The chapter also covers development trends since 2008, outlines hazard-specific scenarios, and incorporates the following tables: 3.1: Capabilities by Community, 3.38: Assets, Vulnerabilities, and Risks by Community, and 3.39: Community Assets in Floodway/Floodplain – Stephenson County. Finally, counts of insured repetitive loss structures are noted and continued participation in/compliance with the National Flood Insurance Program (NFIP) is covered.

Chapter 4: Mitigation Strategy

Includes revised goals, objectives, actions, and an action plan (including prioritization). In addition, actions completed since the 2008 plan was adopted are listed.

Chapter 5: Post-Planning/Implementation

Integration, implementation, and administration, as well as methods for maintaining, monitoring, evaluating, and updating the plan between 2016 and 2021 are addressed. Public participation during plan maintenance is covered. Appendix G includes resolutions of adoption by participating jurisdictions (county and municipal).



CHAPTER 1: PLANNING

CHAPTER 1: PLANNING

OVERVIEW

This chapter lays the groundwork for the hazard mitigation planning process. The term is defined, federal requirements are noted, and the local planning process is described (including pre-planning work). Furthermore, Chapter 1 addresses the planning committee, stakeholders (within and outside of the county), and the public, as well as completed outreach and research.

What is hazard mitigation planning?

Mitigation is defined as "sustained actions taken to reduce or eliminate long-term risk to life and property from hazards."[1] According to FEMA, state, tribal, and local governments "are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects. The [Stafford] Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for [governments] to undertake a risk-based approach to reducing risks from natural hazards through mitigation planning."[2] Comprehensive regulations, guidance, and policies pertaining to or further defining hazard mitigation requirements are available on FEMA's website.

In addition to meeting federal statutory requirements that ensure eligibility for funding, hazard mitigation planning offers other benefits, noted in the following table.

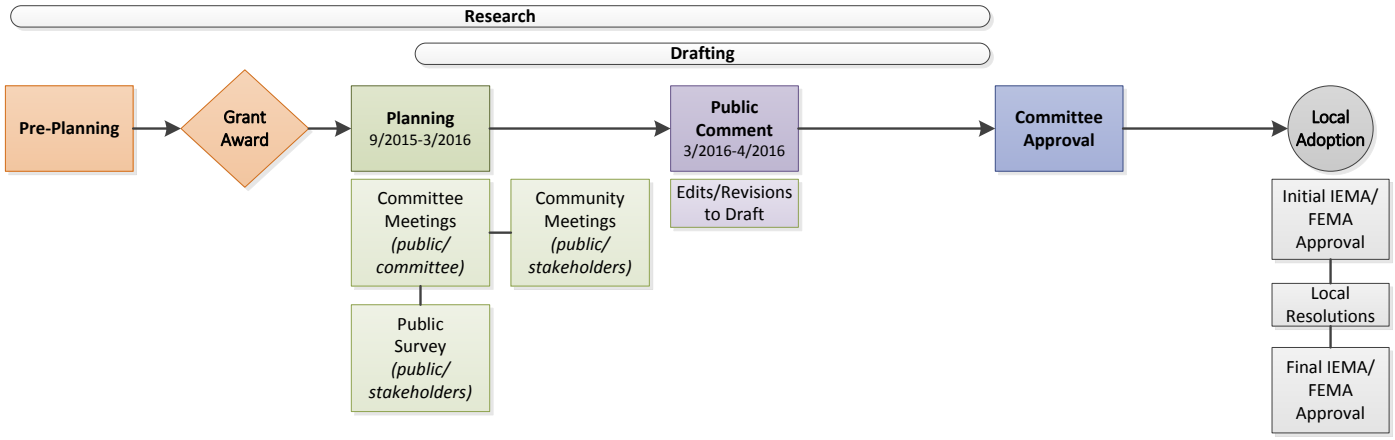
Table 1.1: Hazard Mitigation Planning Benefits

Direct Benefits	Indirect and/or Potential Benefits
• Ensure county and municipal eligibility for pre-disaster and post-disaster hazard mitigation grants • Identify hazard mitigation planning stakeholders • Increase public awareness about the risks of county/jurisdiction-specific hazards • Establish and prioritize mitigation goals, objectives, actions, and responsibilities with respect to available resources	*If hazard mitigation strategies are implemented, the plan may:* • Reduce recovery costs • Decrease human and property exposure to hazards • Improve emergency preparation, response, and recovery • Encourage ongoing stakeholder participation and monitoring • Support ongoing community planning efforts

[1] "Beyond the Basics: Best Practices in Local Mitigation Planning," mitigationguide.org, last accessed December 11, 2015
[2] "Hazard Mitigation Planning Laws, Regulations & Policies," Federal Emergency Management Agency (FEMA), last accessed September 30, 2015

LOCAL PLANNING PROCESS

Illustration 1.1: Local Planning Process



Pre-Planning

In September 2015, the City of Freeport accepted a grant extension from IEMA to update the 2008 Stephenson County Multi-Hazard Mitigation Plan, which had expired in 2013.

The Freeport Community Development Department (FCDD) had, prior to accepting the extension, contacted the Stephenson County Emergency Management Agency (SCEMA) to request support during the local planning process. To ensure adequate staffing, the City of Freeport would eventually recruit Blackhawk Hills Regional Council (BHRC), northwest Illinois' regional planning commission, to provide facilitation, technical, and drafting services.

Illustration 1.2: Lead Agencies

Emergency Management Agency
STEPHENSON COUNTY
295 W Lamm Rd
Freeport, IL 61032
www.stcoema.org

Community Development Department
CITY OF FREEPORT
524 W Stephenson St, Ste 330
Freeport, IL 61032
www.ci.freeport.il.us

Blackhawk Hills
REGIONAL COUNCIL
102 E Rte 30, Ste 3
Rock Falls, IL 61071
www.blackhawkhills.com

2008 Multi-Hazard Mitigation Plan

The previous document – researched, compiled, and written by Vandewalle and Associates, based in Madison, WI – provided the updated plan's foundation. Although there have been notable additions and revisions, a significant portion of the original data and analysis from the 2008 planning process was included in the 2016 document.

Planning Committee

Lead agencies (SCEMA, FCDD, and BHRC) began by reassembling members of the 2008 committee still available to meet. New members representing various government, emergency management, regulatory, community organizations, and jurisdictions were invited to join.

Table 1.2: Planning Committee and Meeting Attendance

			Attendance (y/-)			
Name	Title	Agency	M1 9/15	M2 10/15	M3 12/16	M4 2/22
Andra Taylor	Regional Property Manager	Freeport Housing Authority	y	-	-	-
Bruce Johnson	Manager	Stephenson County Farm Bureau	y	y	y	-
Craig Beintema	Public Health Administrator	Stephenson County Health Department	y	-	-	-
David Pietryla	Community Relations and Economic Development Manager	Nicor Gas	-	y	-	-
Douglas Toepfer	Emergency Preparedness Coordinator	FHN	y	-	y	Y
Jeffery Mikkelsen	Planning and Development Committee Chair	Stephenson County	y	-	-	-
Jill Janssen	Vice President of Administrative Services	Highland Community College	y	-	-	-
Joe Ginger	Vice President	Yellow Creek Watershed Partnership	y	y	y	Y
Jon Staben	Planning Commission Chair	Freeport Planning Commission	y	-	y	Y
Lorna Chezem	Administrative Coordinator	Stephenson County Soil and Water Conservation District	y	-	-	-
Margaret Larson	Director	University of Illinois Extension	y	y	-	-
Mark Marti	Chief Deputy	Stephenson County Sheriff's Office	y	-	-	-
Ronnie Bush	Resident, Third Ward, City of Freeport	n/a	-	-	y	-
Scott Miller	Fire Chief	Freeport Fire Department	-	y	-	-
Shaun Gallagher*	City Engineer	City of Freeport	-	y	-	Y
Shelly Griswold	Community Development Specialist	Fehr-Graham	y	-	-	Y
Steve Ehlbeck	Superintendent of Parks	Freeport Park District	y	y	-	Y
Terry Groves	Zoning Director	Stephenson County	y	y	-	Y
Todd Barkalow	Police Chief	City of Freeport	-	y	-	-
Tom Cassidy	Maintenance	Freeport Housing Authority	y	-	-	-
Yvette Alexander-Maxie	External Relations Manager	American Red Cross	y	y	-	y
LEAD AGENCY REPRESENTATIVES						
Robert Baker	Director	SCEMA	y	y	y	y
Brea Adams	Assistant Director	SCEMA	y	y	y	Y
Alexander Mills	Community Development Director	FCDD	-	y	-	-
Nick Jupin	Grants Coordinator	FCDD	y	-	y	Y
Daniel Payette	Outreach Coordinator	BHRC	y	y	y	y
Andrew Shaw	GIS Mapping Specialist	BHRC	y	y	y	y
MUNICIPAL REPRESENTATIVES						
Tyson Terhune	Coordinator of Economic Development and Support Services	Village of Lena	-	y	-	-
Shawn Cox	Village President	Village of Cedarville	-	-	y	Y
Tim Wilson	Clerk	Village of Dakota	-	-	-	Y
Norman Truessel	Trustee	Village of Davis	-	-	-	Y
Shaun Gallagher*	Trustee	Village of German Valley	-	y	-	-

Name	Title	Agency	*Attendance (y/-)*			
			M1 9/15	M2 10/15	M3 12/16	M4 2/22
William Backus	Trustee	Village of Pearl City	y	y	y	y
Kurt Schilling	Trustee	Village of Orangeville	-	-	y	y
Michael Siedschlag	Village President	Village of Orangeville	-	-	y	y
Don Hoyle	Trustee	Village of Orangeville	-	-	y	-
Kim Kopp	Village President	Village of Ridott	-	-	y	-
DuWayne Olson	Trustee	Village of Ridott	y	-	-	-
Charles Halbleib	Trustee	Village of Rock City	-	y	-	y
Mary Marks	Trustee	Village of Winslow	-	-	y	y
Ken Rose	Trustee	Village of Winslow	-	-	y	y
Terri Rose	Village President	Village of Winslow	-	-	y	y

*Note: invited to the process but not attending for various reasons (e.g., staff shortages, vacancies, other representation provided, etc.): all chief elected officials of county and municipal government, the Lake Summerset Association, ComEd, IDNR, the Mutual Aid Box Alarm System (MABAS), the Freeport School District, the City of Freeport Public Works, and the Stephenson County Highway Department. * = representing Freeport and German Valley.*

Agendas were distributed before each meeting. Each meeting was open to and encouraged public attendance, participation, and comment. Meeting notices were provided to community leaders, media outlets in the Stephenson County region, public libraries, and websites. See Appendix C for agendas, minutes, media coverage, etc.

Table 1.3: 2015-2016 Planning Committee/Public Meeting Dates

Meeting #1/Kick-Off – September 21, 10 a.m. at Stephenson County Farm Bureau Synopsis: introductions, discussion of outreach strategy, review of previous plan, review of hazards, consideration of mission	**Meeting #2 – October 20, 2:30 p.m.** at Stephenson County Farm Bureau Synopsis: adoption of mission statement, continued review of previous plan, continued review of hazards, review of goals
Meeting #3 – December 29, 6 p.m. at FHN Memorial Hospital Synopsis: complete risk assessment, complete review of goals, review strategies (projects and programs), discussion of vulnerabilities and prioritization of hazard mitigation actions	**Meeting #4 – February 22, 6 p.m.** at FHN Memorial Hospital Synopsis: complete review of strategies and priorities, solidify action plan, finalize implementation and maintenance (including responsibilities and schedule), consider criteria for success

Stakeholder & Public Involvement

SCEMA invited the chief elected official of each Stephenson County municipality and the president of the Lake Summerset Association to participate in the local planning process. Officials were asked to use a pre-addressed, pre-paid post card provided by SCEMA to confirm municipal or association participation. Responses were recorded as they were received; some replies were received over telephone or email.

Table 1.4: Participating Municipalities

2016 Plan Update		2008 Plan
Included in this table as a participating municipality if lead agencies received written, telephone, or email confirmation and participated at some point during the planning process:		*Included in this table as a participating municipality if plan was adopted:*
1. City of Freeport	9. Village of Ridott	1. City of Freeport
2. Village of Cedarville	10. Village of Rock City	2. Village of Dakota
3. Village of Dakota	11. Village of Winslow	3. Village of German Valley
4. Village of Davis	12. Stephenson County	4. Village of Orangeville
5. Village of German Valley		5. Village of Pearl City
6. Village of Lena		6. Village of Ridott
7. Village of Orangeville		7. Village of Winslow
8. Village of Pearl City		8. Stephenson County

Lead agency staff also met with representatives from participating communities to review past progress, capabilities, assets, hazards, vulnerabilities, goals, etc. Meetings included elected officials and/or staff members, community and/or economic development representatives, and persons with historical knowledge of the community and/or hazard events. Local officials/staff were responsible for promoting and/or securing local participation. Meetings were held in the following communities (accounting for all eleven municipalities and Stephenson County):

Table 1.5: 2015-2016 Community Meetings

Meeting Date, Time	Jurisdiction	Attending
November 18, 1 p.m.	Village of Lena	Chris Posey (Environmental and Safety Manager at Adkins Energy), Steve Schaible (Chief of Police), Tyson Terhune - L (Coordinator of Economic Development and Support Services)
November 18, 3 p.m.	Village of Winslow	Mike Milliken (Trustee), Ken Rose (Trustee), Terri Rose - L (Village President)
December 1, 6 p.m.	Village of Ridott	Jon Jilderda (Trustee), Kim Kopp - L (Village President), DuWayne Olson (Trustee), Cindy Olson (Trustee)
December 7, 6 p.m.	Village of Orangeville	Doug DeSchepper (Superintendent), Don Hoyle - L (Trustee), Larry Rackow (Chief of Police), Kurt Schilling (Trustee), Michael Siedschlag (Acting Village President), Leslie Schmidt (Clerk), Mel Wickman (Chief of Fire)
December 28, 9 a.m.	Village of Pearl City	Robert Acshe (Trustee), William Backus - L (Trustee), Bob Knoup (Village President), Kirk Knoup (Citizen), Rob Knoup (Superintendent of Public Works), Mark Toepfer (Citizen)
January 15, 3 p.m.	Village of Rock City	Charles Halbleib - L (President)
January 19, 7 p.m.	Village of Davis	Ray Casewell (Public Works Director), Ed Koelling (Chief of Fire), Judy LaFurge - L (Trustee), Bradley Meinert (Village President), Norman Truessel (Trustee)
January 20, 1 p.m.	City of Freeport	Todd Barkalow (Chief of Police), Travis Davis (Police Lieutenant), Tom Dole (Superintendent of Streets), Jim Gitz (Mayor), Nick Jupin - L (Grants Coordinator), Alexander Mills (Community Development Director), Scott Miller (Chief of Fire), Shaun Gallagher (City Engineer), Tom Glendenning (Executive Director of Utilities), Art Ross (Third Ward Alderman)
January 26, 11 p.m.	Village of Cedarville	Shawn Cox - L (Village President), Cindy Lloyd (Clerk), Tom Lloyd (Public Works Superintendent)
February 8, 9 a.m.	Stephenson County	Brea Adams (EMA Assistant Director), Robert Baker - L (EMA Director), Craig Beintema (Public Health Administrator), Terry Groves (Zoning Director), Paul Rampenthal (Acting County Engineer)
February 16, 6:30 p.m.	Village of German Valley	Eric Bruning (Chief of Fire), Mark Jewel - L (Village President), Tim Loffman (Trustee), Ken Pals (Public Works Director)
March 7, 7 p.m.	Village of Dakota	Dave Bordner (Chief of Fire), Laura Bremme (Trustee), Brad Clark (Sewer and Water Superintendent), Arlene Jaeger (Trustee), Jason Knox (Trustee), Chris Kruger (Trustee), Timothy Last - L (Village President), William Long (Trustee), Bill Small (Citizen), Chris Wells (Assistant Chief of Fire), Tim Wilson (Village Clerk)

Note: L indicates local organizer.

At each meeting, participants also considered hazard mitigation actions to include in the 2016-2021 update. Additionally, information about the following documents was collected (when available): capital improvement plan (CIP), zoning map, current and future land use map, comprehensive plan, list of publically-owned structures and parcels, list of potentially hazardous material and brownfield sites, list of desirable infrastructure projects and programs related to hazard mitigation, list of nearby dams, levees, bridges, and other infrastructure, and, finally, emergency operations (EOP), continuity of operations (COOP), and continuity of government (COG) plans. Community maps, provided by lead agencies, were annotated by participants, who penciled in the location of community/critical facilities, vulnerabilities, past hazard events, and other points of interest.

Regarding the ability to improve on capabilities: most municipalities in Stephenson County – especially the smallest in population – have limited planning apparatus. Most plans are informal, and many types of plans found in larger suburban

and urban communities simply do not exist at the rural level. If they do, they can create maintenance burdens. The county has not updated its comprehensive plan since it was produced in 2000; Freeport's was updated in 2010. Scarcity of resources (e.g., financial, technical, etc.), State of Illinois political deadlock, and lackluster civic participation (whether government engaging citizens or citizens engaging government) are sticky issues and will presumably remain so. Furthermore, the county and its various jurisdictions are experiencing greatly reduced development demand (in some localities, development is non-existent and has been so for some time), which means there is less pressure to dedicate resources to planning.

Adjacent Jurisdictions & Government Agencies

Emergency management agency directors from adjacent counties (Jo Daviess, Winnebago, Carroll, and Ogle in Illinois, as well as Green and Lafayette in Wisconsin) were invited via email/phone to attend the December 29, 2015, planning committee meeting. Illinois Department of Natural Resources (including IDNR law enforcement and planning), IEMA, and NWS representatives were also invited to attend. Representatives confirmed attending included Greg Miller and Bud Turner of the counties of Carroll and Winnebago, respectively; each discussed their own hazard mitigation processes, as well as projects and programs potentially related to Stephenson County. The planning committee also solicited input from the aforementioned jurisdictions and agencies during the public comment period.

Public Comment

The planning committee solicited comments from the public between April 22, 2016, and May 27, 2016. Open houses were held at the public library in Freeport and Lena's village hall. These events featured displays of maps and plan contents, including the projects and programs assembled by the planning committee and Stephenson County communities. Draft copies of the plan were posted online (www.stephensonplan.org), made available at Freeport City Hall and the Stephenson County Emergency Management Agency, and forwarded to stakeholders. Such stakeholders included planning team members, neighboring jurisdictions, and state and federal agencies. A press release was issued and a link to the document was distributed via agency social media.

Open House #1 – April 25, 6 p.m.	Open House #2 – April 26, 1 p.m.
at Freeport Public Library Synopsis: brief overview of the process and draft plan; comments solicited; displays	at Lena Village Hall Synopsis: brief overview of the process and draft plan; comments solicited; displays

RESEARCH

Public Survey

Responses were accepted between November and December 2015. Residents of Stephenson County and employees working in the county were encouraged to take the survey online at www.stephensonplan.org or complete a paper version. The URL was included in a press release and distributed to local media; officials from participating communities promoted the URL via social media. Paper surveys were distributed to selected libraries, village halls, banks, and other sites throughout Stephenson County. These pick-up and drop-off locations were mentioned in the press release. News coverage was provided by the Freeport Journal Standard, based in Freeport, and WIFR, based out of Rockford, IL.

Residents and employees were asked about their experiences with Stephenson County hazard events and actions related to individual preparedness and local hazard mitigation measures. Responses were collected and presented during the planning committee's December 29 meeting and used to direct discussion among those present. Future planning processes should budget for and/or secure funds for survey-related postage, acquisition of mailing lists, etc., to derive a more thorough, statistically valid survey of Stephenson County residents.

Plans, Studies, Reports, & Technical Data

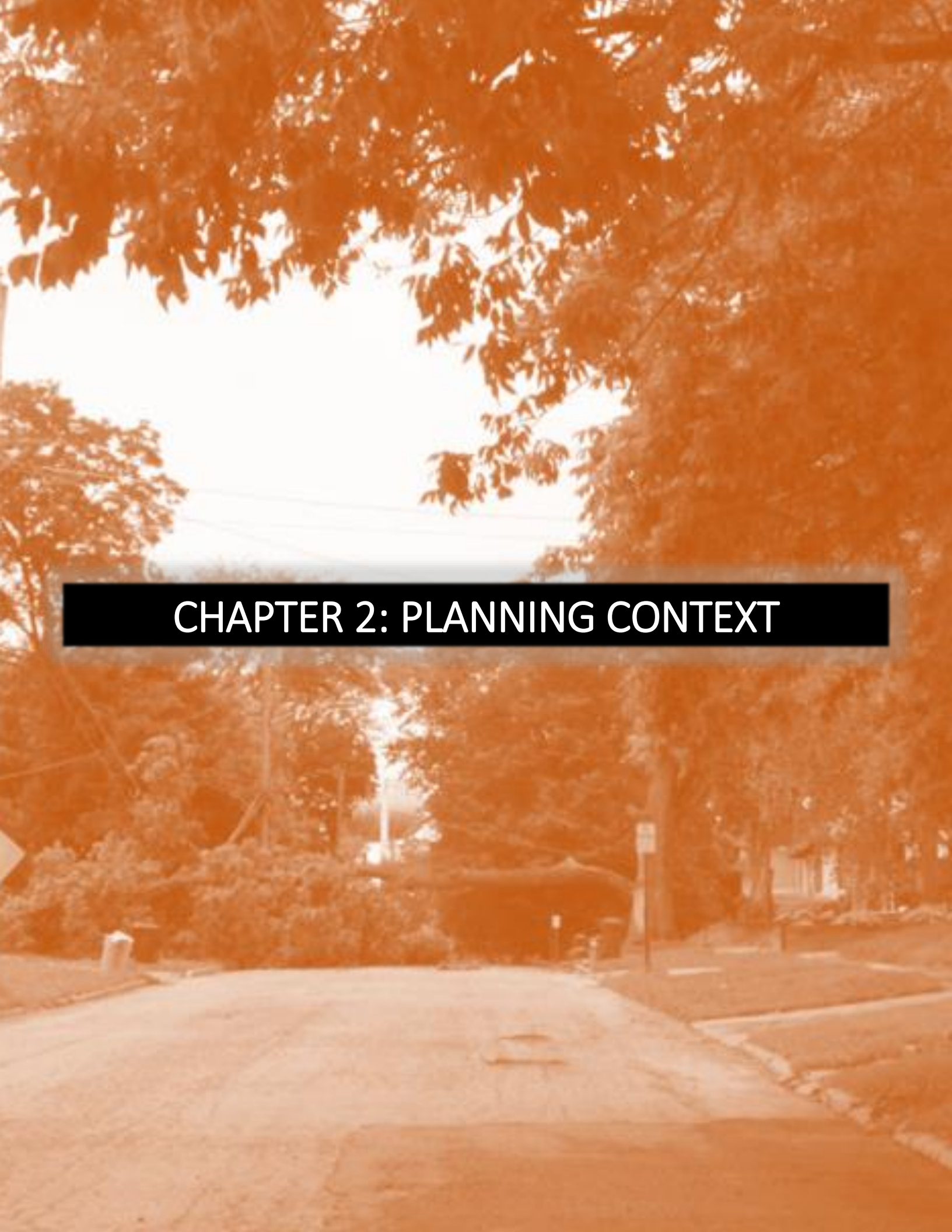
The county's multi-hazard mitigation plan includes data and analysis from previous planning initiatives, including comprehensive and land use plans.

Table 1.6: Documents Incorporated or Reviewed

Focus on Local/County	Focus on Regional/State/Federal
2008 MITIGATION PLAN	

• Flood Insurance Studies:
  ○ City of Freeport - 1976
  ○ Unincorporated Areas of Stephenson County - 1982
  ○ Village of Winslow - 1982
  ○ Village of Pearl City - 1989
• Reconnaissance Report for General Investigations Study: Freeport on Pecatonica River, Illinois – US Army Corps of Engineers (USACE), Rock Island District - 1995
• Stephenson County Disaster Plan - 2006
• Future Land Use Plan for Stephenson County - 2000
• City of Freeport East Side Revitalization Strategy - 2007
• County and municipal zoning and subdivision ordinances
• County and municipal land use plans
	• Illinois Natural Hazard Mitigation Plan - 2004
	• Rock River Basin Assessment, Illinois Environmental Protection Agency (IEPA) - 2006
	• National Weather Service Quad Cities Service Guide (NWS) - 2007
	• National Oceanic and Atmospheric Administration (NOAA) Storm Events Database*
	
	**Name updated since 2008*

2016 MITIGATION PLAN	
• Stephenson County Comprehensive Plan - 1954, 1970, 2001 • Storm Drainage & Erosion Control Management Design Manual - 2008 • City of Freeport Comprehensive Plan - 2010 • East Side Revitalization - 2007 • East Side Revitalization - 2013 • Green Infrastructure Guide Book - 2013 • The Spark: Rekindling Freeport's Legacy of Innovation - 2013 • Third Ward Healthy Neighborhoods - 2013 • Freeport Forward: Riverfront Neighborhood Project - 2015 • Digital Flood Insurance Rate Maps (DFIRMs)/Flood Insurance Rate Maps (FIRMs) • Websites: Freeport Forward and Rawleigh Complex Redevelopment	• Illinois Natural Hazard Mitigation Plan - 2013 • National Oceanic and Atmospheric Administration (NOAA) Storm Events Database • Threat and Hazard Identification and Risk Assessment – 2015



CHAPTER 2: PLANNING CONTEXT

CHAPTER 2: PLANNING CONTEXT

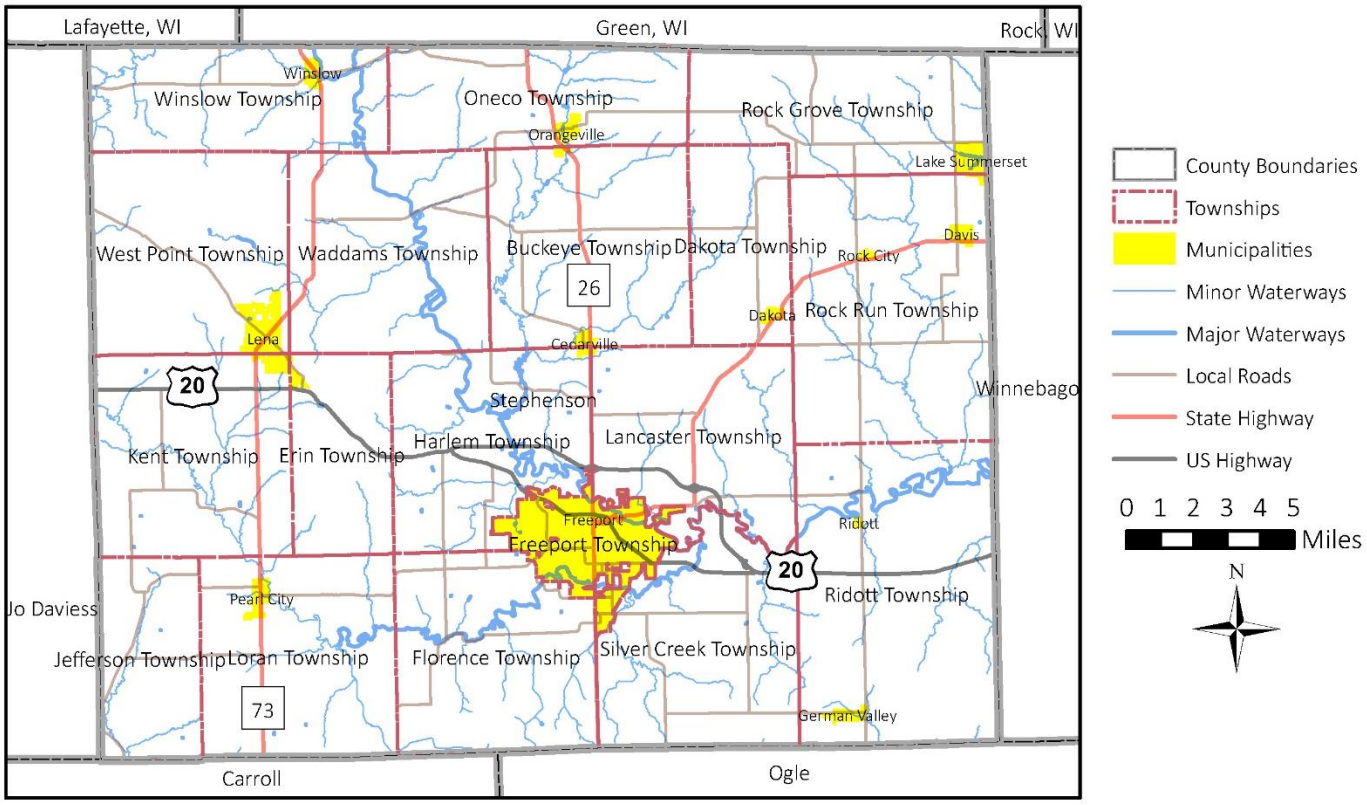
OVERVIEW

Chapter 2 provides geographic, geologic, climatic, demographic, and other planning context for hazard mitigation strategies.

GEOGRAPHY

Geography & Governance

*Map 2.1: Political Divisions – Stephenson County**



Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Ancy Shaw, December 1, 2015

**Maps like this one and others contained within are available enlarged in a supplemental document.*

Stephenson County is located in northwest Illinois and covers approximately 564.52 square miles.[3] The county shares a western border with Jo Daviess County, an eastern border with Winnebago County, and a southern border with Carroll County and Ogle County. Its northern border is shared with Green County, WI, and Lafayette County, WI. Freeport, the county seat, has 53.52% (24,851 people)[4] of the county's estimated 2014 population of 46,435.[5]

The Stephenson County Board, the county's governing body, consists of twenty-two elected members. A total of fifty-nine taxing bodies serve various constituencies.[6]

Table 2.1: Selected Units of Government – Stephenson County

Municipalities	Townships (18)	Fire Protection Districts (13)	School Districts (5)	College Districts (1)
CITIES (1)	Buckeye	Cedarville/McConnell	Dakota	Highland Community College
Freeport	Dakota	Dakota	Freeport	
	Erin	Davis	Lena-Winslow	
VILLAGES (10)	Florence	Freeport City	Orangeville	
	Freeport	Freeport Rural	Pearl City	
Cedarville	Harlem	German Valley/Ridott		
Dakota	Jefferson	Lena		
Davis	Kent	Orangeville		
German Valley	Lancaster	Pearl City/Kent		
Lena	Loran	Pecatonica		
Orangeville	Oneco	Rock City		
Pearl City	Ridott	Shannon		
Ridott	Rock Grove	Winslow		
Rock City	Rock Run			
Winslow	Silver Creek			
	Waddams			
	West Point			
	Winslow			

Note: not all fifty-nine taxing bodies are listed above.

[3] "Stephenson County, Illinois," State and County Quick Facts, US Census Bureau, updated October 14, 2015
[4] "Freeport (city), Illinois," State and County Quick Facts, US Census Bureau, updated October 14, 2015
[5] "Stephenson County, Illinois," State and County Quick Facts, US Census Bureau, updated October 14, 2015
[6] "2014 Property Tax Statistics," Illinois Department of Revenue (IDOR), last accessed January 19, 2015

Physical Geography

Map 2.2: Driftless Area

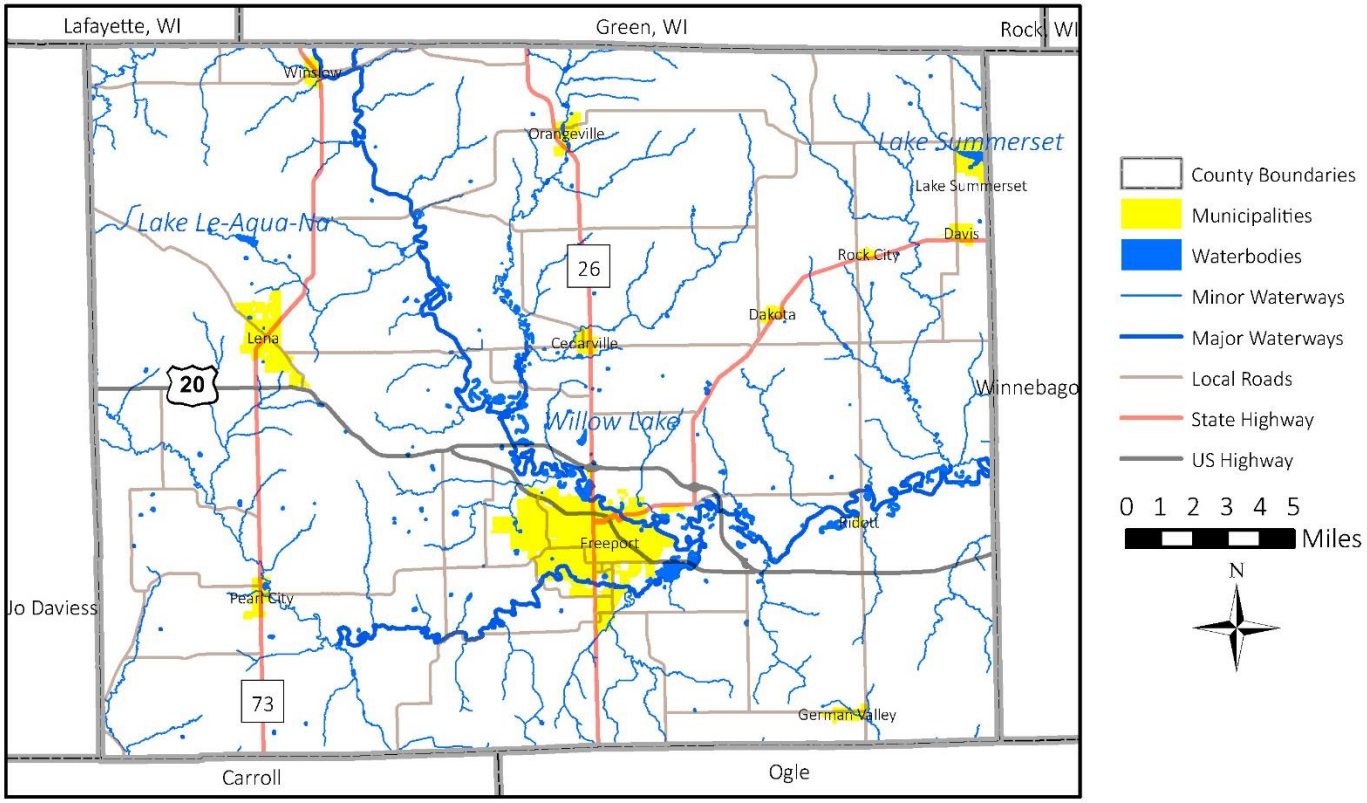
Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

Stephenson County is positioned on the southeastern edge of the Driftless Area, an unglaciated hilly region that includes northwest Illinois and portions of Wisconsin, Iowa, and Minnesota. Generally, the county's topography rolls gently.

FEATURES

Waterways & Waterbodies

Map 2.3: Rivers and Lakes – Stephenson County

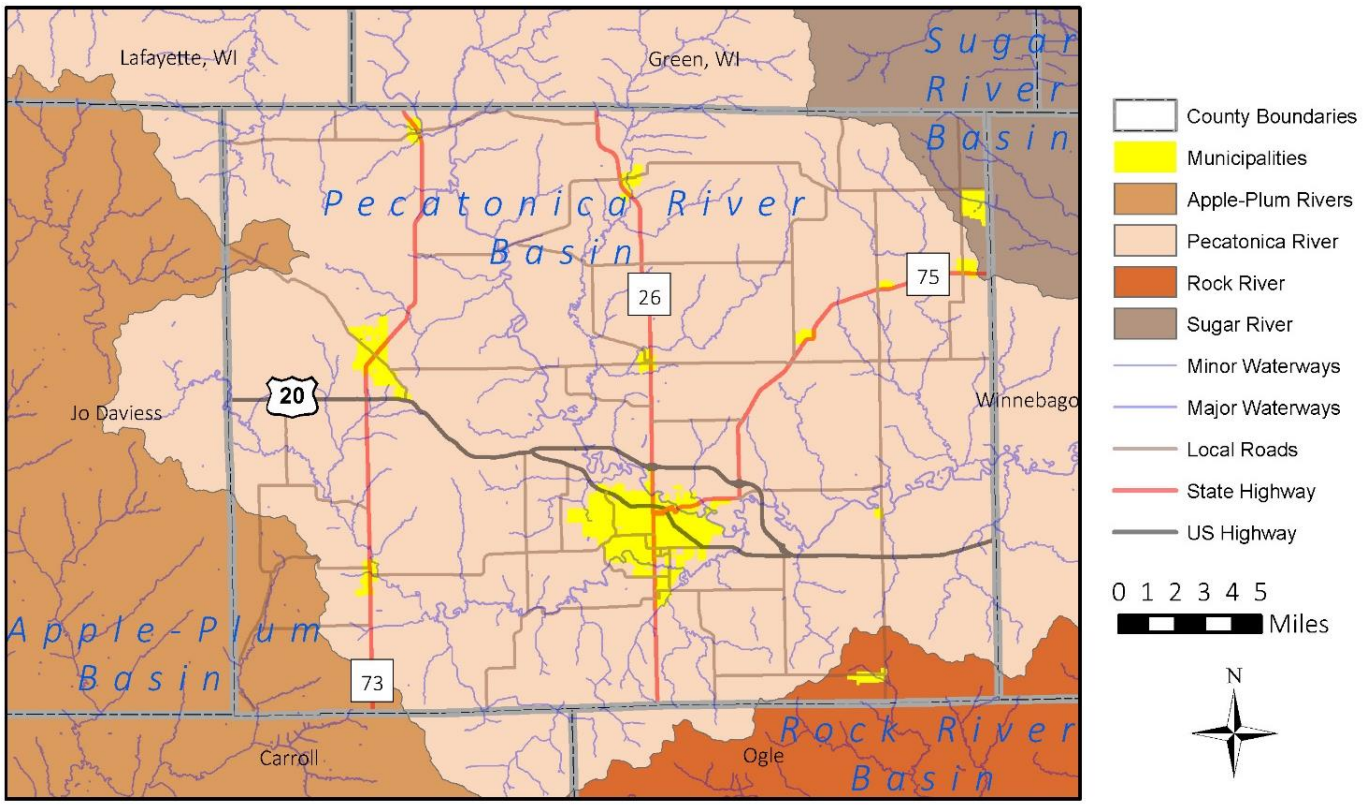


Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Ancy Shaw, December 1, 2015

One of Stephenson County's most prominent natural features is the Pecatonica River, which runs from Iowa County in Wisconsin, then into northern Illinois, and finally into the Rock River in Winnebago County. Stephenson County is impacted by flooding along the Pecatonica River and various area creeks (e.g., Yellow Creek, Currier Creek, etc.). Most of these creeks are tributaries to the Pecatonica River. Lakes in Stephenson County include Lake Le-Aqua-Na, Lake Summerset, and Willow Lake.

Watersheds

Map 2.4: Watersheds/Drainage Basins – Stephenson County



Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

A watershed is an area that drains into a common waterway or waterbody. Typically, small watersheds are part of larger ones. Stephenson County is located almost entirely within the Pecatonica River Watershed, which in addition to Stephenson County, covers the counties of Jo Daviess, Carroll, Ogle, and Winnebago in Illinois.[7] The Pecatonica River Watershed is connected to the Rock River Watershed and Mississippi River Watershed. Generally speaking, water in the county flows from the Pecatonica River, to the Rock River, and to the Mississippi River.

[7] "Science in Your Watershed," United States Geological Survey (USGS), updated March 5, 2014

Table 2.2: Acres of Watershed – Stephenson County[8]

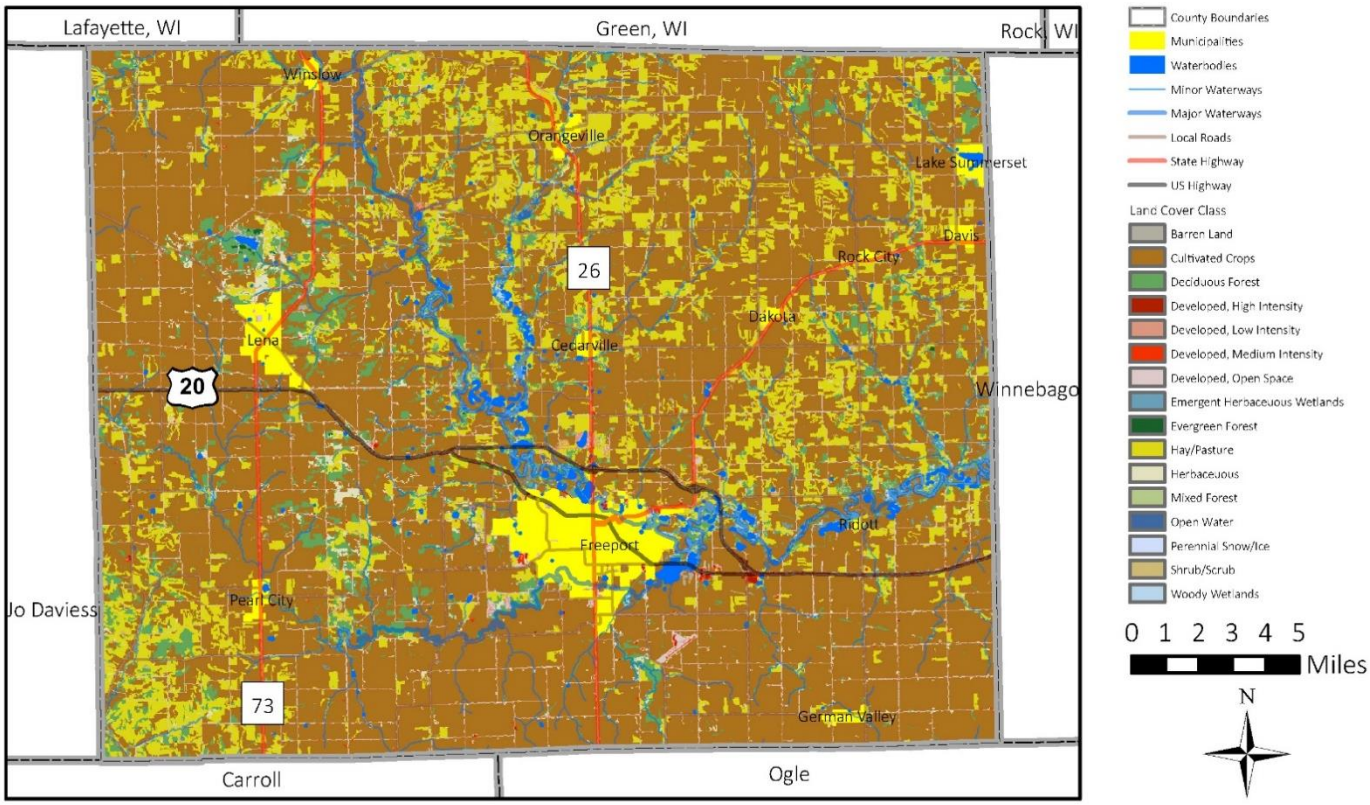
Pecatonica River Watershed	Apple-Plum River Watershed	Lower Rock River Watershed
ACRES OF COUNTY IN WATERSHED 335,098.77	*ACRES OF COUNTY IN WATERSHED* 18,620.95	*ACRES OF COUNTY IN WATERSHED* 343,098.26
% OF COUNTY IN WATERSHED 93%	*% OF COUNTY IN WATERSHED* 5.15%	*% OF COUNTY IN WATERSHED* 95%
MUNICIPALITIES IN WATERSHED All municipalities but German Valley.	*MUNICIPALITIES IN WATERSHED* No municipalities in Stephenson County.	*MUNICIPALITIES IN WATERSHED* All municipalities in Stephenson County.

Floods occur over areas defined by watersheds and are not solely contained within the bounds of political divisions. The sometimes unpredictable flow of water demands that neighboring jurisdictions work together to effectively manage flood risks and minimize the potential for damage. Policy makers must consider that within a watershed, development upstream directly affects communities downstream.

[8] Blackhawk Hills Regional Council analysis, based on the "National Hydrography Dataset," United States Geological Service

Land Cover, Soils, & Slopes

Map 2.5: Land Cover – Stephenson County



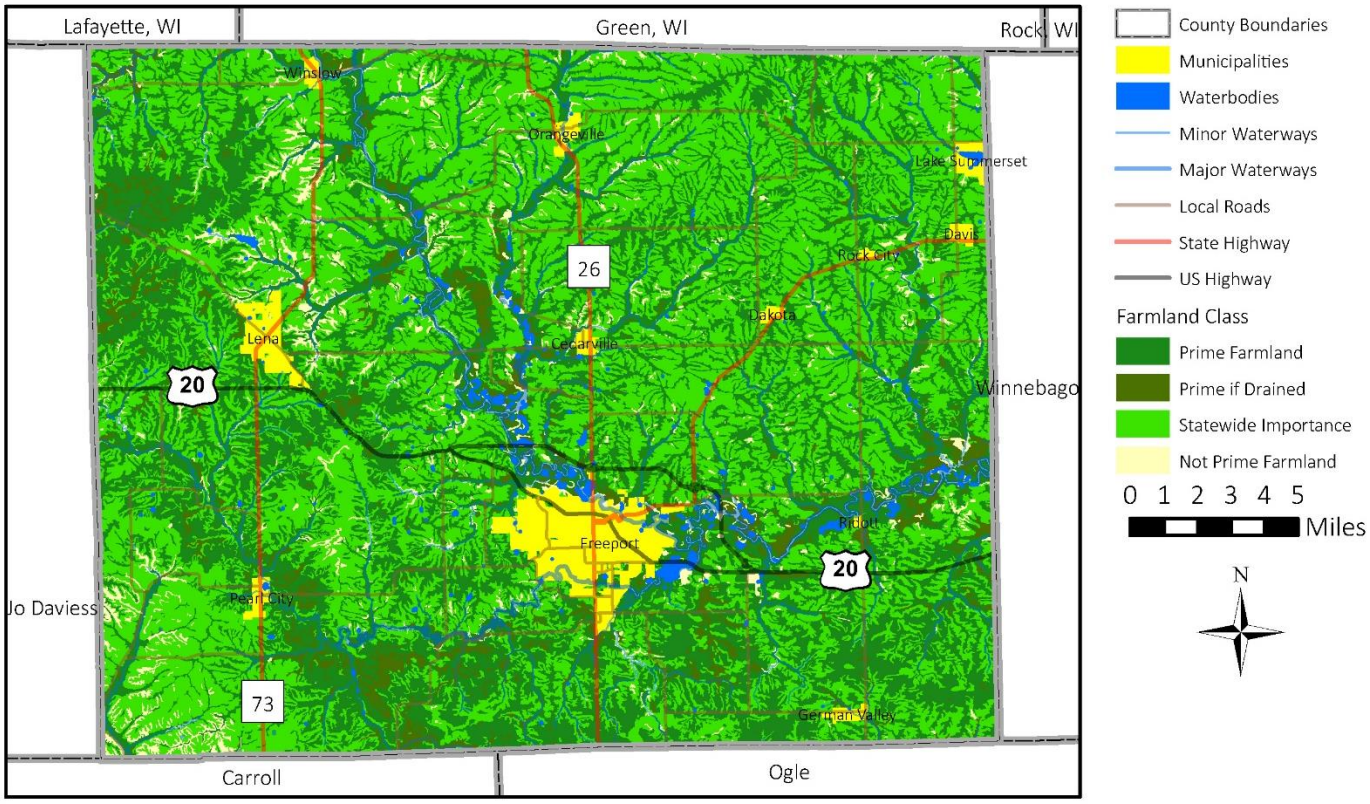
Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

Table 2.3: Land Cover by Classification and Area – Stephenson County[9]

National Land Cover Database Classification	Area (sq mi)	Percent
Cultivated Crops	377.69	66.84
Pasture/Hay	93.37	16.52
Deciduous Forest	32.41	5.74
Developed, Open Space	25.01	4.43
Developed, Low Intensity	14.75	2.61
Grassland/Herbaceous	6.85	1.21
Emergent Herbaceous Wetlands	3.52	0.62
Woody Wetlands	3.35	0.59
Developed, Medium Intensity	3.35	0.59
Developed, High Intensity	1.13	0.20
Open Water	1.07	0.19
Shrub/Scrub	1.07	0.19
Mixed Forest	1.03	0.18
Barren Land (Rock/Sand/Clay)	0.24	0.04
Evergreen Forest	0.19	0.03

[9] Blackhawk Hills Regional Council analysis, based on the "National Land Cover Database 2011," Multi-Resolution Land Characteristics Consortium

Map 2.6: Prime Farmland – Stephenson County



Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Ancy Shaw, December 1, 2015

Most land in Stephenson County is so-called "farmland of statewide importance" (48.68%) or "prime farmland"/"prime if drained" (47.03%).[10] Of these distinct, non-overlapping categories, prime farmland is considered to have greater agricultural value. Less than 5% of Stephenson County land falls outside of the above classifications.

Table 2.4: Soil by Classification and Area – Stephenson County[11]

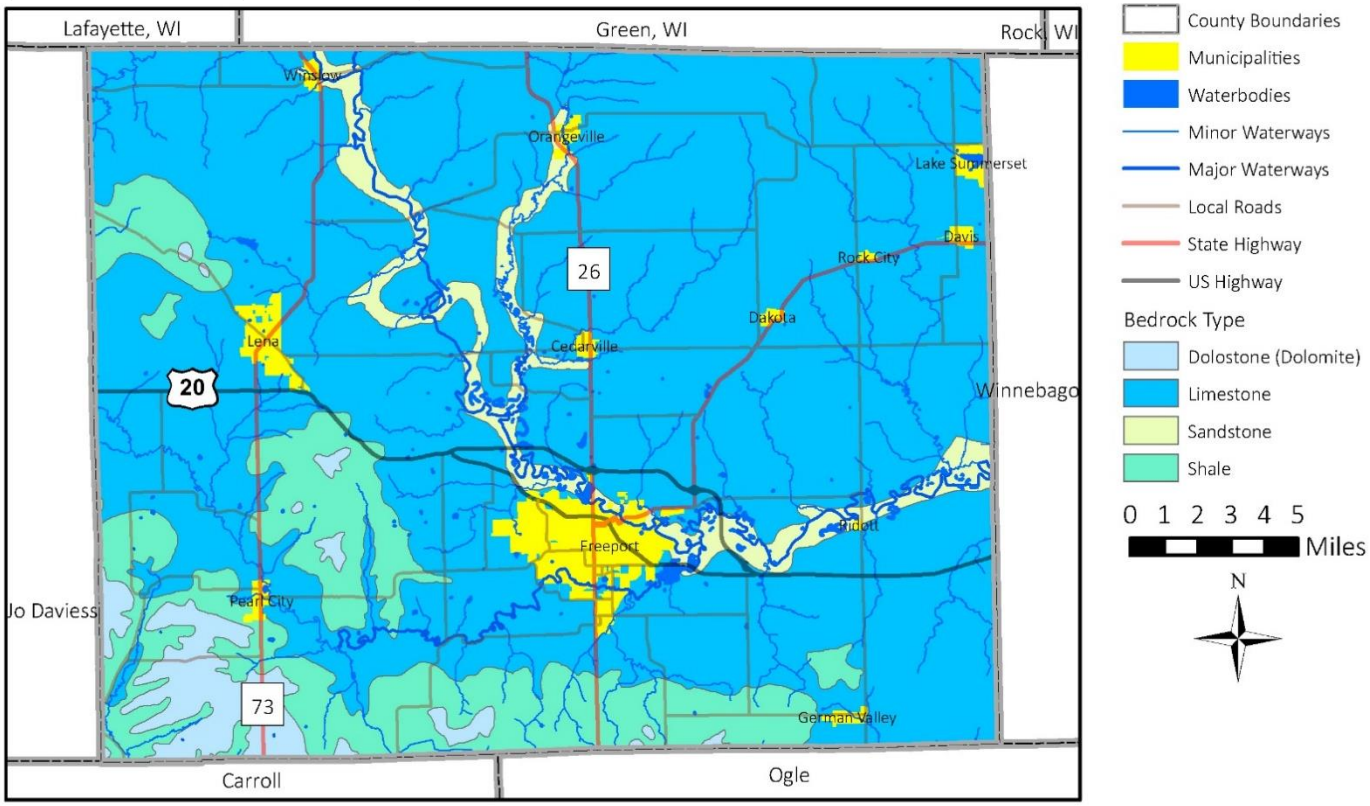
Soil Classification	Area (sq mi)	Percent
Farmland of statewide importance	275.02	48.71
Prime farmland	237.77	42.11
Prime if drained	27.62	4.89
Not prime farmland	24.25	4.29

Soil erosion varies according to slope. The average slope in Stephenson County is 2.29% with a total relief range of 470 feet.[12] According to IEPA's Rock River Basin Assessment, published in March 2006, "flat upland areas and floodplains [, which are common in Stephenson County,] generally have a low potential for soil erosion." However, "areas of steeper slopes adjacent to floodplains are susceptible to severe soil erosion[.]"[13] Erosion contributes to the destruction of fertile land. Landowners and farmers can use soil conservation methods (e.g., planting cover crops) to break the erosion cycle and maintain topsoil. These methods can decrease flooding potential, prevent washouts, and improve water quality.

[10] Blackhawk Hills Regional Council analysis, based on "Web Soils Survey," Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (USDA), last accessed February 3, 2016
[11] Ibid
[12] "Illinois High and Low," Illinois State Geological Survey (ISGS), last accessed September 25, 2015
[13] "Rock River Basin Assessment: an Overview of the Rock River Watershed in Illinois," IEPA, published March 2006

Geology

Map 2.7: Bedrock – Stephenson County



Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

ISGS data[14] indicates most Stephenson County bedrock is of the Galena-Platteville group, including limestone (45%), dolostone/dolomite (45%), and shale (10%). Furthermore:

- Some river bedrock is of the Ancell group and consists of sandstone (60%), dolostone/dolomite (30%), limestone (10%), and evaporate (no percentage given).
- Portions of southern and western Stephenson County bedrock is of the Maquoketa Group, which consists of shale (20%), limestone (70%), and siltstone (10%).
- Finally, there are small pockets of the Silurian group in the county's southwest quadrant. These pockets include dolostone/dolomite (50%), limestone (50%), and coral bedrock (no percentage given).

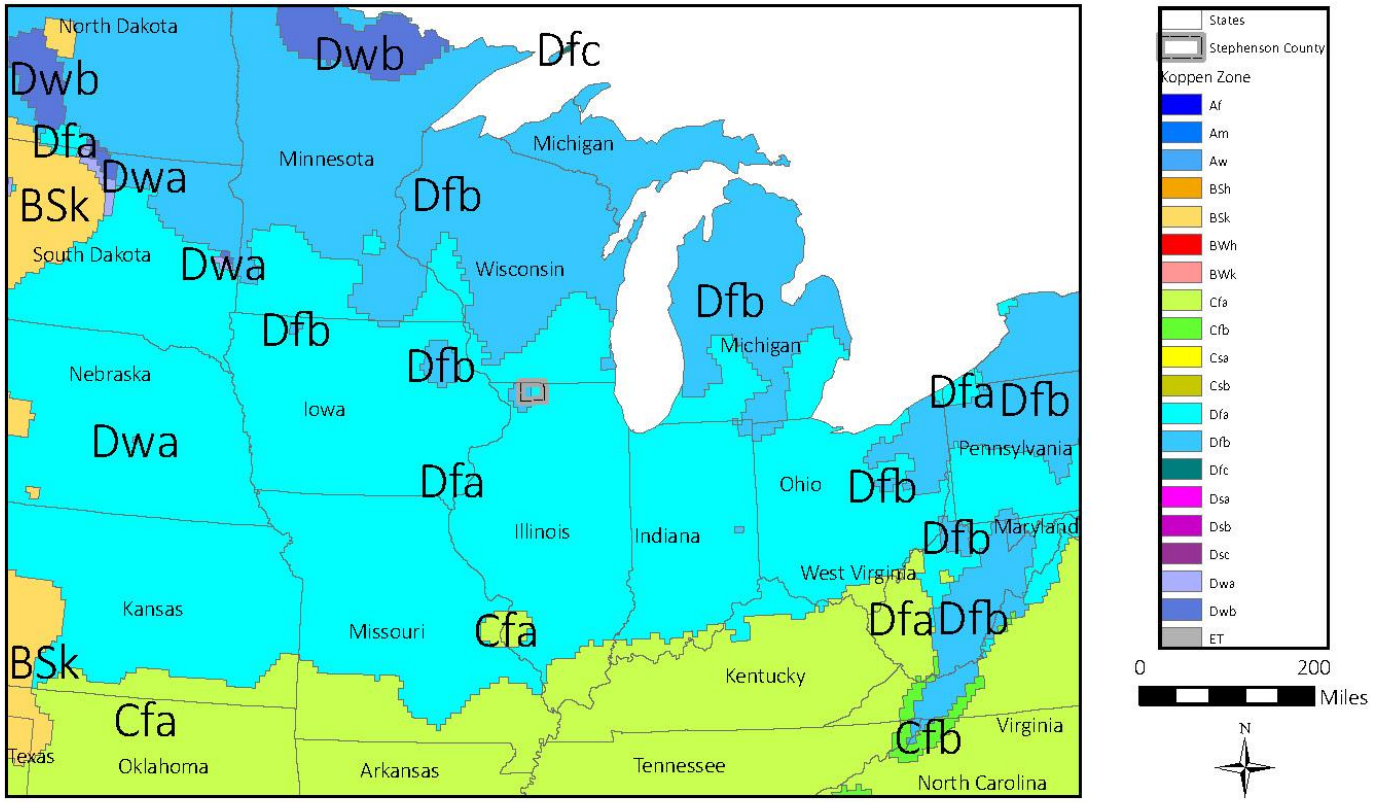
Dolostone/dolomite and limestone (both prominent in Stephenson County bedrock) are susceptible to dissolution from sources of water, including snow and rain. The dissolution process can lead to the formation of sinkholes and the development of karst, which "refers to a landscape that typically is pockmarked with sinkholes, may be underlain by caves, and has many large springs that discharge into stream valleys."[15] When undertaking hazard mitigation actions related to land use, policy makers should note the presence of karst, as well as preservation-worthy dolomite and upland prairies in Stephenson County.

[14] "Illinois Geologic Map Data," United States Geological Service, updated October 13, 2015
[15] "Karst Landscapes of Illinois: Dissolving Bedrock and Collapsing Soil," ISGS, last accessed September 25, 2015

Climate

The county's climate is classified as a mix of Dfb and Dfa ("humid continental") under the Koppen-Geiger climate classification. Britannica explains that "hot summers and cold winters" and the "changeable nature of weather in all seasons is a characteristic feature of [Dfb and Dfa climates]." Predicted changes in climate may intensify or prolong certain hazards (including, but not limited to, drought, flooding, and severe thunderstorms) and should be addressed.

Map 2.8: Koppen-Geiger Climate Zones



Data: US Census TIGER, Koppen Data adapted from Peel MC, Finlayson BL & McMahon TA (2007), Updated world map of the Köppen-Geiger climate classification, Hydrol. Earth Syst. Sci., 11, 1633-1644 and Blackhawk Hills Regional Council. Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

Generally speaking, Stephenson County and Illinois are middle-of-the-pack with respect to annual precipitation (when compared to other states and regions).

Table 2.5: Precipitation and Temperature Normals – Stephenson County[16]

Place	Precipitation (in) - Annual	Min Tmp (F) - Annual	Avg Tmp (F) - Annual	Max Tmp (F) - Annual	Low Tmp (F) - Monthly	High Tmp (F) - Monthly
Stephenson County (Freeport WWP, IL US)	36.06	37.5°	47.9°	58.3°	11.2° (January)	83.4° (July)

[16] "1981-2010 U.S. Climate Normals," National Centers for Environmental Information (NCEI), NOAA, last accessed January 19, 2016

DEMOGRAPHICS

Population[17]

Stephenson County's population has decreased since the 2000 Census was taken. As of the "2014 Annual Estimates of Resident Population," the county's population was 46,435, down from 48,979 in 2000 (a 5.19% decrease). All municipalities lost population between 2010 and 2014; Freeport, the county seat and largest municipality, experienced a 3.1% decrease in population from 2010 to 2014.

Table 2.6: County and Municipal Population Totals

	2000	2010	2014
COUNTY			
Stephenson County	48,979	47,711	46,435
MUNICIPAL			
Cedarville	719	741	726
Dakota	499	506	486
Davis	662	677	653
Freeport	26,443	25,638	24,851
German Valley	481	463	456
Lena	2,887	2,912	2,840
Orangeville	751	793	768
Pearl City	780	838	818
Ridott	159	164	161
Rock City	313	315	311
Winslow	345	338	333

Note: municipal totals do not add up to Stephenson County total because of unincorporated areas.

Housing[18]

In 2010, Stephenson County had 22,081 housing units, up from 21,713 housing units in 2000. A 2014 estimate put housing units at 21,926. In 2000, renters accounted for 25.2% of housing tenure. The percentage of renters increased to 28.1 in 2010. In 2000, 91.1% of housing units were occupied; over a decade, the percentage of occupied housing decreased slightly, to 89.9.

[17] "DP-1 - Profile of General Demographic Characteristics: 2000," "DP-1 - Profile of General Population and Housing Characteristics: 2010," "PEPANNRES - Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2014," US Census Bureau's American Fact Finder, last accessed September 30, 2015

[18] "DP-1 - Profile of General Demographic Characteristics: 2000," "QT-H1 - General Housing Characteristics: 2000," "QT-H1 - General Housing Characteristics: 2010," "PEPANNHU - Annual Estimates of Housing Units for the United States, Regions, Divisions, States, and Counties: April 1, 2010 to July 1, 2014," US Census Bureau's American Fact Finder, last accessed November 3, 2015

Employment & Industry

The annual average unemployment for Stephenson County was 7.4% in 2014, down from 9.5% in 2013 (Illinois' rates were 7.1% and 9.1%, respectively).[19] Business establishments in Stephenson County numbered 1,087 in 2013.[20] The US Census Bureau defines a business establishment as "a single physical location where business is conducted or where services or industrial operations are performed." Countywide, business establishments with retail trade, other services, and construction NAICS codes were most numerous, numbering 158, 143, and 118 establishments, respectively. Regarding so-called "other services," the Bureau of Labor Statistics explains that "establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grant-making, advocacy, and [providing dry cleaning and laundry, personal care, death care, pet care, and related services]."

Table 2.7: Top Employers by Number of Employees (100 or more) – Stephenson County[21]

Employer	Type	Employees
FHN	Public/Non-Profit	1,400
The Helm Group	Private	750
Freeport School District #145	Public/Non-Profit	750
Honeywell	Private	545
Highland Community College	Public/Non-Profit	425
Berner Food & Beverage	Private	395
Titan Tire	Private	390
Wal-Mart	Private	380
Snak King	Private	350
County of Stephenson	Public/Non-Profit	350
Stewart & Associates	Private	300
Newell Rubbermaid	Private	260
City of Freeport	Public/Non-Profit	216
Danfoss	Private	210
Liberty Village	Public/Non-Profit	183
Provena/St. Joseph Campus	Public/Non-Profit	160
Menards	Private	145
Willowglen Academy	Public/Non-Profit	145
Morse Electric	Private	130
Sentry Insurance	Private	120
YMCA	Public/Non-Profit	120
Fischer	Private	115
Cub Foods	Private	110
Pearl Pavilion	Public/Non-Profit	105
Parkview Home	Public/Non-Profit	105
Seaga	Private	105
HB Plastic	Private	100
Stephenson Service Company	Private	100

[19] "Annual Averages by Area - Local Area Unemployment Statistics," Illinois Department of Employment Security, last accessed December 18, 2015

[20] "2013 County Business Patterns (NAICS)," Censtats Databases, COTS Integration Branch, Application Services Division, US Census Bureau, last accessed November 19, 2015

[21] "Stephenson County Major Employers," Northwest Illinois Development Alliance (NIDA), published January 19, 2016

UTILITIES

These include communication lines (copper, coaxial, or fiber optics), transportation, power (electric or gas), as well as drinking water and wastewater systems.

Table 2.8: Utilities by Municipality – Stephenson County

Public or Private Utility	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
Water	Public	Public	Public	Public	Public	Public	Public	Public	Private	Public	Public
Wastewater	Public	Public	Public	Public	Public	Public	Public	Public	Private	Public	Public
Electric	ComEd										
Natural Gas	Nicor Gas										
Communications	National: Comcast, Frontier, Mediacom, US Cellular, Verizon, Rise Broadband Local/Regional: Aero Group, iFiber, JCWIFI										

Most municipalities have public water and public wastewater treatment systems. Municipalities with public water and public wastewater treatment systems manage their own facilities. Ridott is the only municipality in Stephenson County without public water or public wastewater treatment. Residents and businesses in unincorporated Stephenson County rely on private on-site waste treatment (septic) systems and private on-site wells. Residents of unincorporated Willow Lake and Lake Summerset receive water and wastewater treatment through community systems, operated by Northern Hills Utilities (Willow Lake) and Otter Creek Lake Utility District (Lake Summerset). There is also a community wastewater treatment system located at W Stephenson St Rd and N/S Rink Rd that serves multiple trailer and manufactured homes.

ComEd supplies electric service to all of Stephenson County; Nicor Gas supplies natural gas service to most of the county, with the exception of unincorporated areas (including Lake Summerset). Communications services are provided by a number of companies, including national companies like Comcast, Frontier, Mediacom, and Rise Broadband. National companies US Cellular and Verizon provide cellular service. Regional service providers like Aero Group, iFiber, and JCWIFI offer Internet, VoIP, and/or broadband transport services to public and private sector end users.

Table 2.9: Wastewater Treatment Plants – Stephenson County

Pearl City

Winslow

Willow Lake

Davis

Rock City

Lake Summerset

German Valley

Orangeville

Freeport

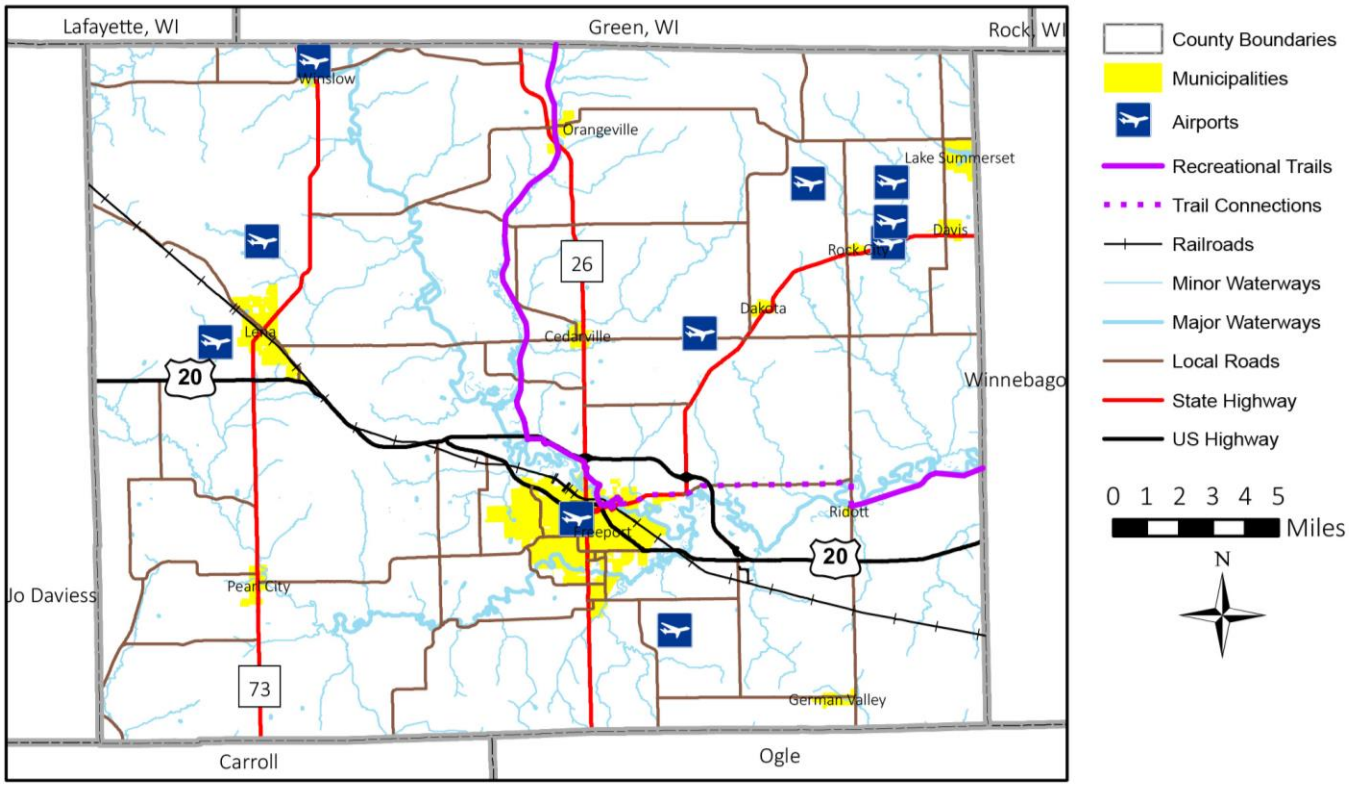
Lena

Dakota

Cedarville

TRANSPORTATION & OTHER INFRASTRUCTURE

Map 2.9: Transportation Infrastructure – Stephenson County



Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

The Illinois Department of Transportation (IDOT) calculated Stephenson County's annual Vehicle Miles Traveled (VMT) at 398,023,477 for 2014; annual daily VMT in 2014 was 1,090,475.[22] There is approximately 1,314.67 miles of roadway in Stephenson County (township roadway accounts for 811.54 miles, or 61.73% of total roadway).[23] In general, VMT has decreased since the 2008 plan was published.

[22] "2014 Illinois Travel Statistics," IDOT, published April 2015
[23] Ibid

The Pecatonica River is a navigable waterway; however, neither public nor private barges use it for transport. Although Stephenson County has nine airports, most are small and for private use.

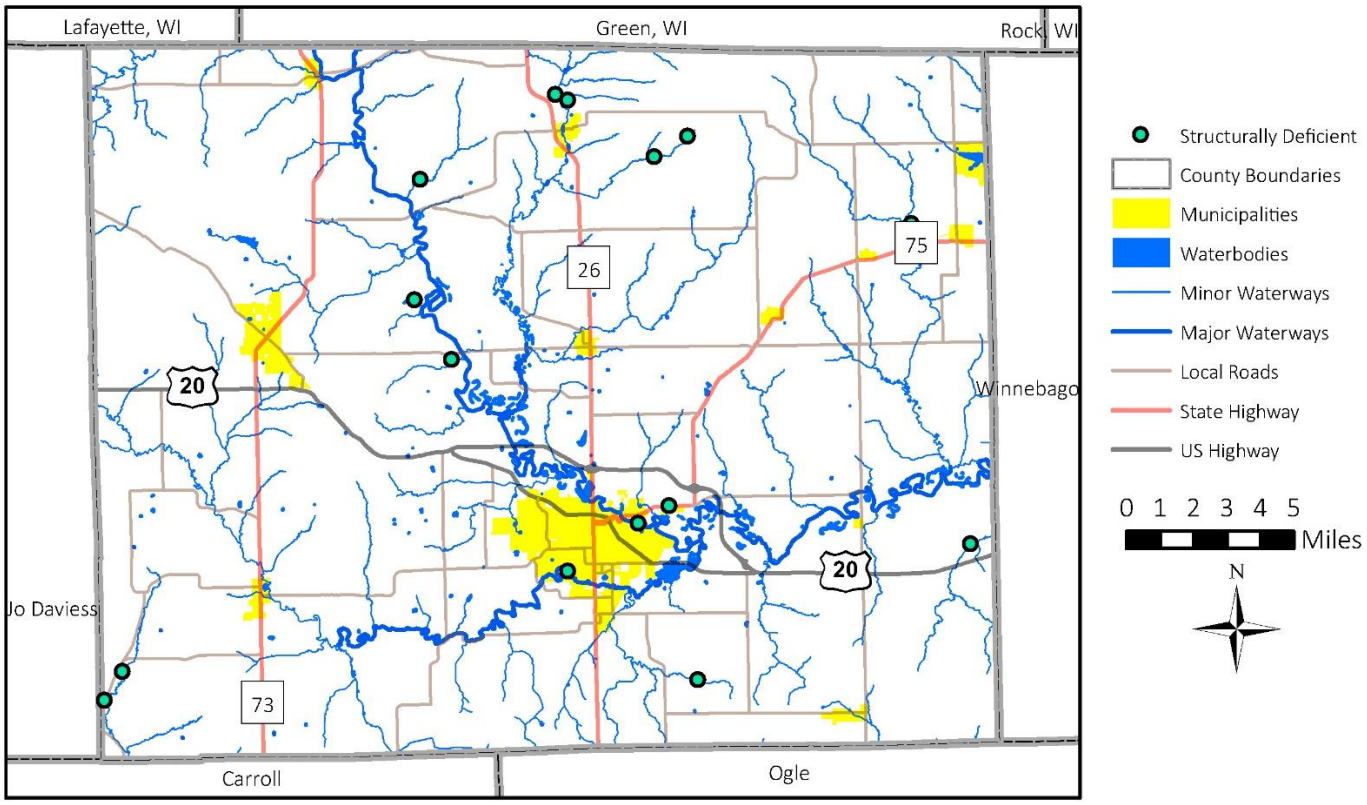
Table 2.10: Trains, Planes, and Automobiles – Stephenson County[24]

Major Roadways	Railways	Airports	Heliports
US Rte 20 IL Rte 26 IL Rte 73 IL Rte 75	Canadian National • Route: track runs SE to NW, intersecting Freeport and Lena; parallels US Rte 20 Freeport to Lena; parallels W Stage Coach Rd Lena to the county line • Freight: petroleum, chemicals, grain, fertilizers, coal, metals, minerals, forest products, and automobiles	Airports • Publicly-owned, public use (1): Albertus (Freeport) • Privately-owned, public use (1): Ronald K. Dornink (Freeport) • Privately-owned, private use (7): Ellis (Davis), Kramer (Lena), Red Shed Field (Lena), Chester Wyss (Rock City), Hillman (Rock City), Sue Rock Intl (Cedarville), and Mitek (Winslow)	Heliports • Privately owned, private use (1): FHN Memorial Hospital (Freeport)

[24] "Airport Data & Contact Information," Federal Aviation Administration (FAA), updated December 10, 2015

IDOT maintains a statewide dataset of bridges. Over three hundred bridges span various stretches in Stephenson County, dating from 1896 to present day.[25] Fifteen (approximately 5%) are rated structurally deficient.[26] Most structurally deficient bridges are located on local roadways (county, township, and municipal, rather than state routes). Some of these bridges have cultural and historical value.

Map 2.10: Structurally Deficient Bridges (private bridges not considered) – Stephenson County



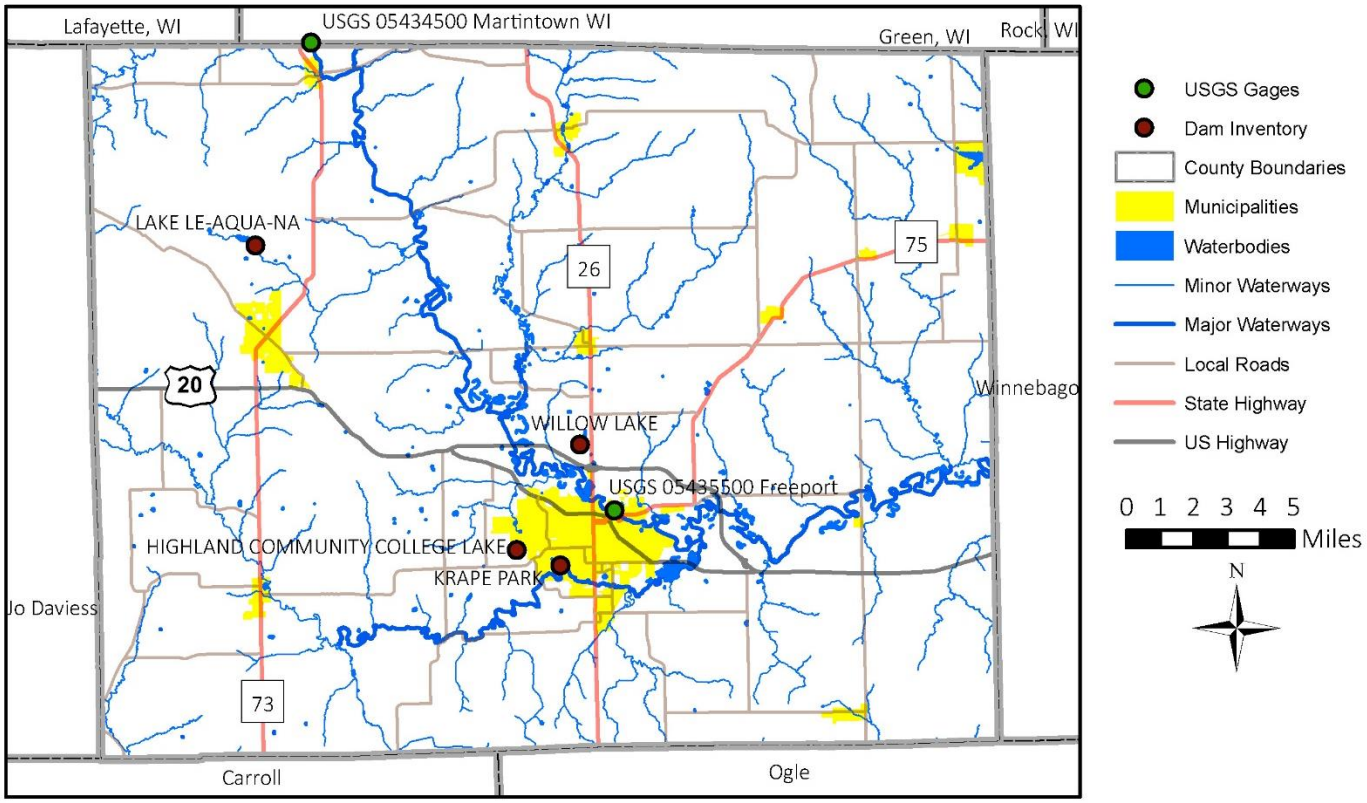
Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

[25] "Bridge Information," IDOT, last accessed December 18, 2015
[26] Ibid

The National Inventory of Dams, maintained by USACE, counts three major dams in Stephenson County. Dams are included by USACE if they meet certain risk thresholds. Another dam (which does not meet established thresholds for NID inclusion) is found in Krape Park in Freeport. Planning committee members report that earthen levees – constructed by farmers – border segments of the Pecatonica River north of Freeport (e.g., near McConnell). Smaller earthen or otherwise manmade dams may exist on private property and elsewhere in the county.

A system of USGS streamgages measures water levels nationally. USGS maintains a streamgage on the Pecatonica River that measures water levels near Freeport. Nearby streamgages include one in Martintown, WI, near Winslow in northwestern Stephenson County and one in Shirland, IL, in adjacent Winnebago County (the streamgage in Shirland is not pictured on Map 2.11).

Map 2.11: Streamgages and Notable Dams – Stephenson County

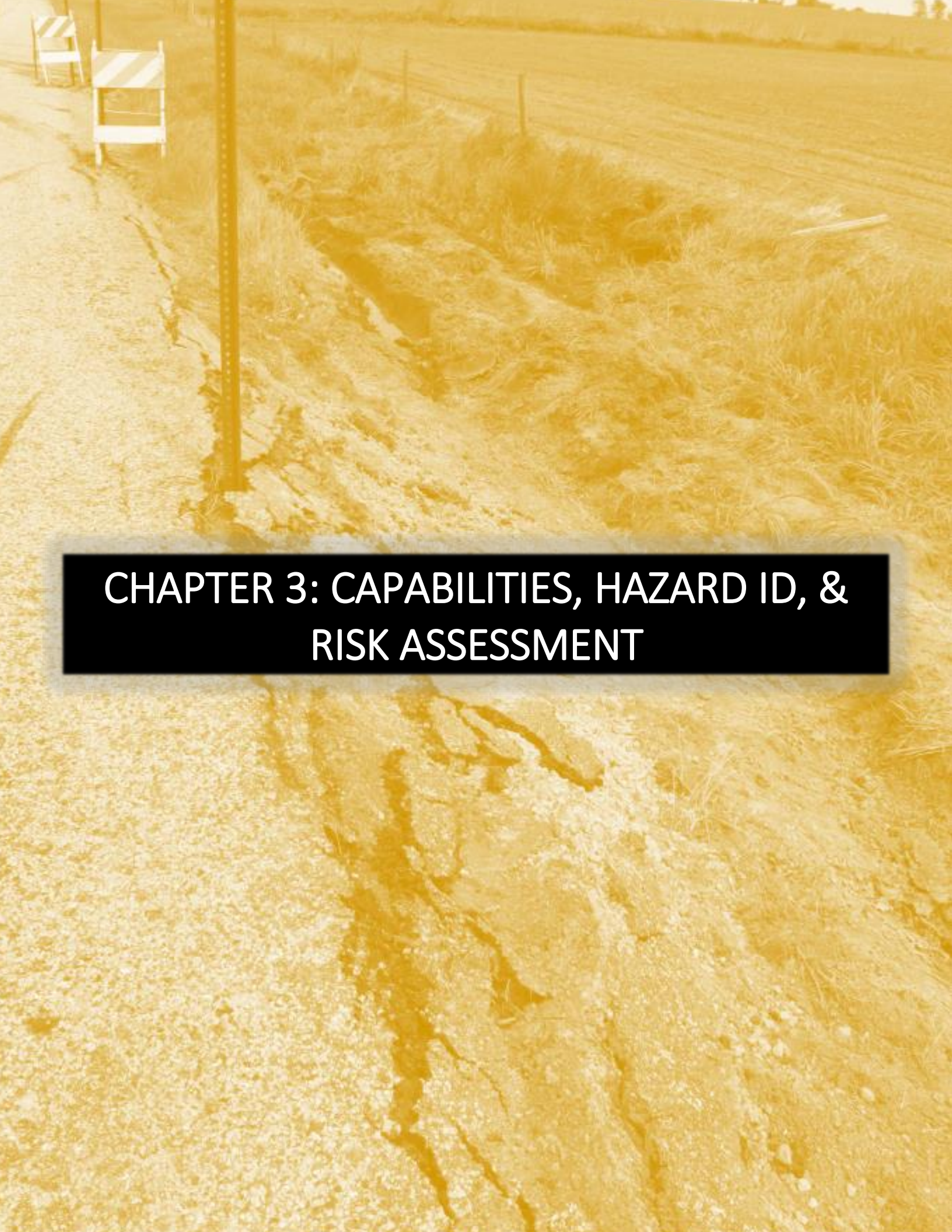


Data: IDOT T2, National Hydrography Database, NHDplus, Web Soil Survey, US Census, USGS Mineral Resources, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

EMERGENCY SERVICES

SCEMA maintains the county's Emergency Operations Center (EOC), which supports the Incident Command System (ICS). The EOC is currently located at the Stephenson County Highway Department. Countywide, there are two 9-1-1 Public Safety Access Points (PSAPs) – one serves the City of Freeport; the other serves the remainder of Stephenson County. Both PSAPs are capable of dispatching emergency services throughout the county.

Fire protection is provided by thirteen fire protection districts. Districts participate in MABAS, which allows individual departments to request additional emergency response resources from neighboring jurisdictions. The level of alarm, set by the on-scene incident commander, determines the amount of resources deployed. Fire protection districts in Stephenson County belong to MABAS District 17.



CHAPTER 3: CAPABILITIES, HAZARD ID, & RISK ASSESSMENT

CHAPTER 3: CAPABILITIES, HAZARD ID, & RISK ASSESSMENT

OVERVIEW

Chapter 3 identifies community capabilities in Stephenson County and its municipalities (and addresses the various jurisdictions' ability to improve such capabilities). Hazard profiles focus on six natural hazards that impact the county. Type, location, extent, and probability are covered. Each identified hazard's impact on jurisdictions is noted. Furthermore, development and land use trends since 2008 are described.

A list of historical occurrences of hazard events, organized by hazard, are included in Appendix D.

Illustration 3.1: Relationship between Hazards, Assets, and Risk[27]

[27] Illustration from "Defining Risk Assessment," mitigationguide.org, last accessed February 17, 2016

COMMUNITY CAPABILITIES INVENTORY

Information about community capabilities was collected from local stakeholders, as well as relevant governmental databases. If information was unavailable or the capability did not apply, n/a (not available or not applicable) is indicated in the respective column/row. With few exceptions, relative ability to expand and improve on existing capabilities (including policies, programs, and projects) is limited due to financial and staffing scarcities. Of particular importance is demographic decline and the state's fiscal picture, which influence local ability to develop the following.

Table 3.1: Capabilities by Community

Capability	Stephenson County	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
International Building Code	N	N	N	N	Y	N	N	N	N	N	N	N
Capital Improvements Plan	N	Y	N	N	Y	N	N	N	N	N	N	N
CEDS Community	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N
Future Land Use Map	Y	N	N	N	Y	N	N	N	N	N	N	N
Comprehensive Plan	Y	N	N	N	Y	N	N	N	N	N	N	N
COOP or COG	N	N	N	N	N	N	N	N	N	N	N	N
Emergency Operations Plan	Y	N	N	Y	N	N	N	N	N	N	N	N
Evacuee or Refugee Plan	N	N	N	N	N	N	N	N	N	N	N	N
IPWMAN Member	Y	N	N	N	Y	N	N	N	N	N	N	N
NFIP[28] Community Number	170639	170842	170843	n/a	170640	n/a	171340	170641	170642	170643	n/a	170644
NFIP Entry	12/27/74	4/11/75	n/a	n/a	11/2/73	n/a	3/3/11	8/16/74	5/3/74	4/16/76	n/a	3/15/74
NFIP FIRM Current Effective Map	3/16/15	3/16/15(M)	NSFHA	n/a	3/16/15	n/a	3/16/15(M)	3/16/15(M)	3/3/11	3/16/15	n/a	3/16/15
NFIP Community Ratings System	N	N	N	N	N	N	N	N	N	N	N	N
Floodplain Ordinance Updated	1/2015	3/2015	n/a	n/a	3/2015	n/a	3/2015	n/a	n/a	9/2010	n/a	2/2015
Erosion Management Ordinance	N	N	N	N	Y	N	N	N	N	N	N	N
Smart Growth Ordinance	N	N	N	N	N	N	N	N	N	N	N	N
Stormwater Management Ordinance	N	N	N	N	Y	N	N	N	N	N	N	N
Subdivision Ordinance	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N
Zoning Regulations	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Brownfields Redevelopment Plan	N	N	N	N	Y	N	N	N	N	N	N	N
StormReady Certification	Y	N	N	N	N	N	N	N	N	N	N	N
Community Hazards Aware. Prog.	Y	N	N	N	N	N	N	N	N	N	N	N
Planning Commission	Y	N	N	N	Y	N	N	N	N	N	N	N
Community Planner	Y	N	N	N	Y	N	Y	N	N	N	N	N
Chief Building Official/Inspector	Y	N	N	N	Y	N	N	N	N	N	N	N
Civil Engineer	Y	N	N	N	Y	N	N	N	N	N	N	N
Floodplain Manager	Y	N	N	N	Y	N	N	N	N	N	N	N
Grant Writer	N	N	N	N	Y	N	Y	N	N	N	N	N
Community Messaging System	N	N	N	Celly	Nixle	N	N	N	N	N	N	N

Note: communities without engineering or grant writing staff typically contract or use private firms, including Fehr Graham, Willet Hoffman, CFPS, etc. Some communities are able to use their respective school district's messaging system, although the audience is limited. M = no elevation determined (all Zone A, C, and X). NSFHA = non-special flood hazard area. Pearl City had left and has since rejoined NFIP. German Valley might benefit from participation but extremely rarely experiences impacts from flooding.

[28] "National Flood Insurance Program Community Status Book," FEMA, accessed February 3, 2016

DEVELOPMENT TRENDS

Land Value

Stephenson County's total equalized assessed value (EAV) was $752,912,670 in 2015 (over $2 billion in total land and improvement value, otherwise known as fair cash value, which is "the amount for which a property can be sold in the due course of business and trade, not under duress, between a willing buyer and a willing seller").[29] The following table breaks down EAV by residential, commercial, industrial, mineral, and farm classifications.

Table 3.2.1: 2015 EAV, Fair Cash Value, and Parcels – Stephenson County[30]

Class	Equalized Assessed Value	Fair Cash Value	Parcels
Residential	$444,901,844.00	$1,334,705,532.00	17,816
Commercial	$95,243,578.00	$285,730,734.00	1,630
Industrial	$21,607,859.00	$64,823,577.00	171
Mineral	$10,389,355	$31,168,065	67
Farm	$176,390,257.00	$529,170,771.00	6,567

Note: table does not include total EAV or all parcels (excludes railroads).

The next few tables contain information about building replacement costs, building counts by construction type, and square footage by building type, sourced from the HAZUS-MH 3.0 application/database.[31]

Table 3.2.2: Building Replacement Costs – Stephenson County

Class	Replacement Cost
Residential	$4,308,192,000.00
Commercial	$1,187,296,000.00
Industrial	$338,371,000.00
Agriculture	$116,785,000.00
Religion	$144,714,000.00
Government	$43,784,000.00
Education	$104,406,000.00
Total Stephenson County replacement cost = $6,243,548,000.00	

Table 3.2.3: Building Counts by Construction Type – Stephenson County

Type	Buildings
Wood	14,525
Steel	500
Masonry	4,677
Concrete	317
Manufactured	867
Total Stephenson County building count = 20,886	

[29] "Understanding Your Property Tax Bill," IDOR, last accessed January 19, 2016
[30] "2015 Assessor Estimated EAV Report by Tax District – Stephenson County," Stephenson County, published November 16, 2015
[31] "HAZUS-MH 3.0," FEMA, updated November 24, 2015

Table 3.2.4: Square Footage by Building Type – Stephenson County

Class	Square Feet
Residential	30,031,690
Commercial	6,855,590
Industrial	2,134,530
Agriculture	997,630
Religion	733,560
Government	229,500
Education	544,750
Total Stephenson County square feet = 41,527,250	

More information about flood-related exposure and vulnerability (including the value of land and improvements in floodway/floodplain) is included in the "Hazard Profiles: Flooding (& related)" section of Chapter 3.

Building Permits

The US Census Bureau collects data from counties and municipalities to keep track of new construction activity. Development, by all accounts, is stagnant within Stephenson County. Some notable industrial/commercial expansion has occurred/is planned to occur, although major employers have also vacated buildings (notably, Freeport's MetLife complex). Demand for residential construction has dropped enormously, with only eight single family building permits issued in 2014. At some level, the potential for new exposure to natural hazards is likely reduced with the lack of growth, loss of employment opportunities, and the movement of jobs outside of the county and state (although, funding hazard mitigation projects/programs may become more difficult, thus increasing risk).

Table 3.3: Annual New Privately-Owned Residential Building Permits – Stephenson County[32]

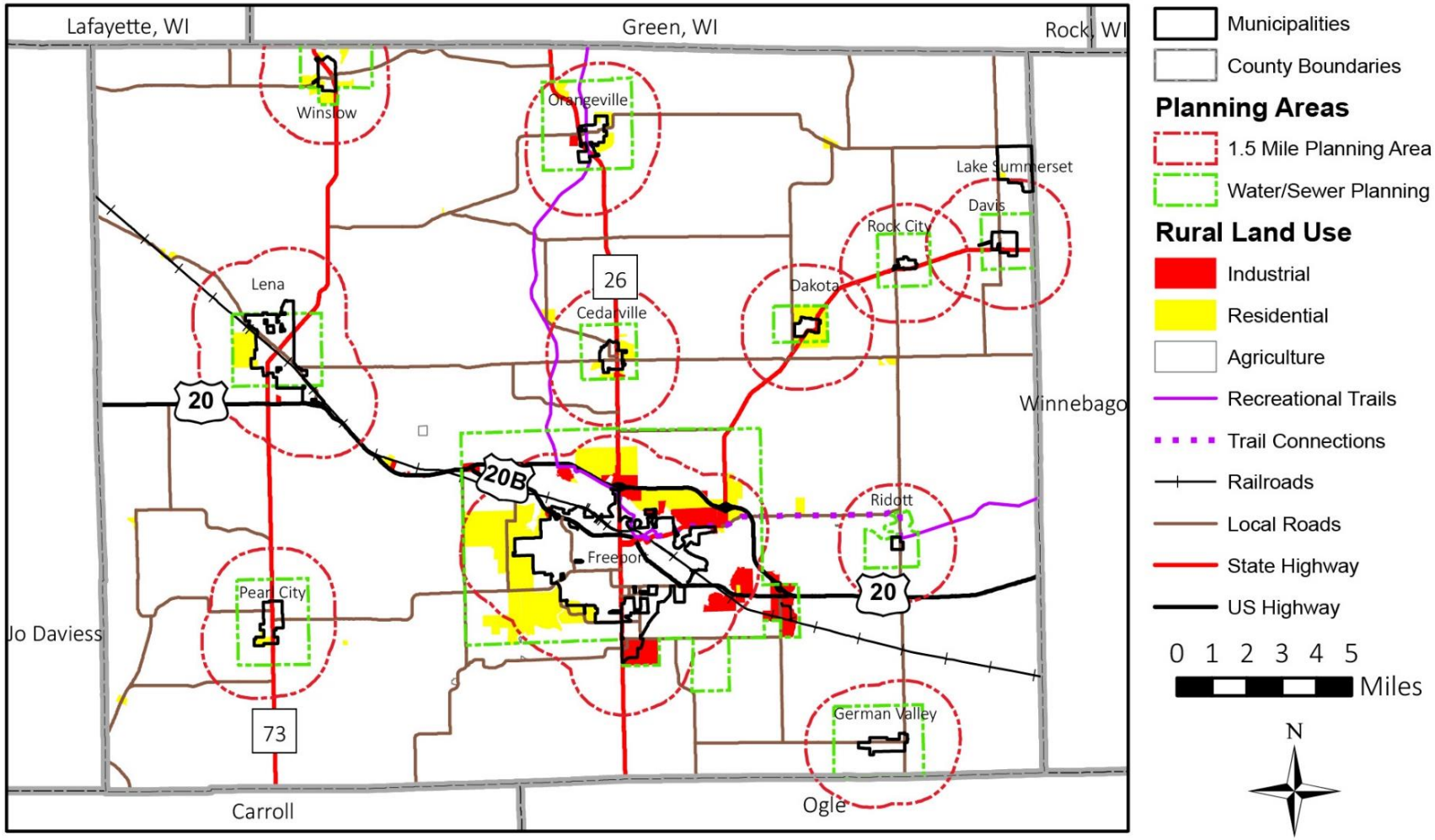
Year	Single Family Permits	Two Family or Greater Permits
2014	8	0
2013	18	0
2012	24	0
2011	10	0
2010	27	0
2009	29	1
2008	30	2
2007	59	5
2006	72	9
2005	90	10
2004	108	0
2003	100	6
2002	108	4
2001	83	8
2000	81	8
1999	128	16

[32] "Annual New Privately-Owned Residential Building Permits," US Census Bureau, last accessed January 19, 2016

Land Use

Only Stephenson County and Freeport have a future land use map (and corresponding comprehensive plan). They were updated in 2000 and 2010, respectively. The land use as presented may not be consistent with current municipal plans/aspirations (although, because municipal plans are largely informal, the county's future land use map provides the best and only* starting point).

Map 3.1: Future Land Use Map – Stephenson County



Data: IDOT T2, US Census, 2000 Stephenson County Future Land Use Plan, and Blackhawk Hills Regional Council.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

*Note: with the exception of Pearl City, the future land use layer was digitized from the 2000 Future Land Use Plan for Stephenson County, IL. Pearl City-area future land use was digitized using maps included in the 2008 Stephenson County Multi-Hazard Mitigation Plan. * = Freeport's future land use map exists only in a conceptual illustration.*

HAZARD IDENTIFICATION

Identifying Hazards

The planning committee members identified or re-identified the following hazards:

Table 3.4: Hazards Impacting Stephenson County and its Municipalities

Natural Hazard (6)	Human/Disease-Related or Other Hazard (10)
Drought	Agricultural Disease Outbreaks
Earthquake	Civil Disturbances
Extreme Temperatures	Cyber Incident
Flooding (& related)	Energy Shortages or Disruptions
Severe Thunderstorms (& related)	Hazardous Materials Incidents
Severe Winter Storms	Major Fires and Explosions
	Nuclear and Radiological Incidents
	Public/Human Health Emergencies
	Terrorism Incidents
	Transportation Incidents

Some previously identified hazards were renamed (i.e., "agricultural disease outbreaks" replaces "foreign animal disease outbreaks"). Cyber incident was added to the human/disease-related hazards and other hazards list. Concerning natural hazards occurring in Stephenson County, only flooding, severe thunderstorm, and severe winter storm events have risen to the level of federally declared disasters (as well as one hurricane event related to Hurricane Katrina).

Table 3.5: FEMA Disaster Declarations including Stephenson County, 1964-2015[33]

Disaster Number	Incident Type	Title	Incident Start	Incident End
1960	Snow	Severe Winter Storm and Snowstorm	1/31/2011	2/3/2011
1935	Severe Thunderstorms	Severe Storms and Flooding	7/19/2010	8/7/2010
3283	Snow	Record Snow and Near Record Snow	2/5/2008	2/6/2008
1722	Severe Thunderstorms	Severe Storms and Flooding	8/7/2007	8/8/2007
3269	Snow	Snow	11/30/2006	12/1/2006
3230	Hurricane	Hurricane Katrina Evacuation	8/29/2005	10/1/2005
1129	Severe Thunderstorms	Severe Storms and Flooding	7/17/1996	8/7/1996
997	Flood	Severe Storms and Flooding	4/13/1993	10/22/1993
3068	Snow	Blizzards and Snowstorms	1/16/1979	1/16/1979
438	Flood	Severe Storms and Flooding	6/10/1974	6/10/1974
276	Flood	Heavy Rains and Flooding	8/30/1969	8/30/1969

[33] "FEMA Disaster Declarations Summary - Open Government Dataset," FEMA, updated January 19, 2016

HAZARD PROFILES: DROUGHT

Drought Overview

Drought is a moderately frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.6.1: Typical Characteristics of Drought

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands to millions in damage to property	Countywide	Less than -4.00 to greater than 4.00 (Palmer)	Months	Months to years

Table 3.6.2: Drought Event Summary

Events	Damages	Frequency (Probability)
13 drought events recorded since 1996	$21,060.00k	Moderate probability of occurring (15%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

The National Drought Mitigation Center (NDMC) defines four categories of drought, three of which are most relevant to Stephenson County:

- Meteorological: usually defined on the basis of the degree of dryness (in comparison to some normal/average amount) and the duration of the dry period
- Hydrological: associated with the effects of periods of precipitation shortfalls on surface or subsurface water supply
- Agricultural: links various characteristics of meteorological or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, etc.

The onset of drought can be difficult to detect (it is not an instant on/instant off phenomenon). The weather, water table, soil moisture, runoff, water quality, and streamflow affect drought conditions. Specifically, high temperature, high wind, and low relative humidity can all contribute to drought severity.[34] In Stephenson County, drought can have a significant impact on crop production. Droughts have also impacted the water production of private, shallow groundwater wells (although municipal water supplies have continued to meet local demand). Hazard mitigation measures should focus on general preparation, water conservation, and best management practices.

One tool for measuring drought is the Palmer Drought Severity Index (PDSI). NDMC explains that "the PDSI allows for a categorization of various levels of wetness and dryness that are prominent over an area. The PDSI is calculated based on precipitation and temperature data, as well as the [soil's available water content]."[35] Classifications range from 4.0 or higher (extremely wet) to -4.0 or lower (extreme drought).

[34] "Definition of Drought," Three Issues of Sustainable Management…, Ojos Negros Research Group, San Diego State University, last accessed February 5, 2016
[35] "How Do I Measure Drought?", National Drought Mitigation Center, University of Nebraska-Lincoln, last accessed February 5, 2016

Table 3.7: Palmer Drought Severity Index[36]

Soil Moisture Score	Description
< -4.00	Extreme drought
-3.99 to -3.00	Severe drought
-2.99 to -2.00	Moderate drought
-1.99 to -1.00	Mild drought
-.99 to -.50	Incipient drought
-.49 to .49	Near normal
.50 to .99	Incipient moist spell
1.00 to 1.99	Moist spell
2.00 to 2.99	Unusual moist spell
3.00 to 3.99	Very moist spell
> 4.00	Extreme moist spell

In 2012, drought conditions were severe enough that then-Governor Pat Quinn activated a task force to respond to the issue. Among the recommendations in a published report included the development of comprehensive plans and the improvement of awareness programs geared towards drought recovery. Notable drought events also occurred in 2005, 1988, the 1950s, and the 1930s.[37]

Summary of Drought Impacts & Vulnerabilities

- All Cities (Freeport) and All Villages (Cedarville, Dakota, Davis, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, and Winslow): municipal water supply shortages, dry vegetation
- Stephenson County: private well water shortages, dry vegetation, agricultural production

See *Table 3.38: Assets, Vulnerabilities, and Risks by Community*, *Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County*, and *Maps 3.2 - 3.11 for other vulnerabilities.*

[36] "Forest Fires and Drought in the U.S. Southwest," U.S. Global Change Research Program, last accessed March 22, 2016
[37] "Yesterday's Climate - Drought: Notable Historical Drought Events," Illinois Water Supply Planning, Illinois State Water Survey (ISWS), last accessed February 5, 2016

HAZARD PROFILES: EARTHQUAKE

Earthquake Overview

An earthquake is a less frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.8.1: Typical Characteristics of Earthquake

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands to millions in damage to property	Countywide	0.0 to 7.7 or greater (Richter)	Immediate	Seconds to minutes

Table 3.8.2: Earthquake Event Summary

Events	Damages	Frequency (Probability)
8 recorded as having impacted or been felt in Stephenson County from 1638-1999	n/a	Low probability of occurring (5%) yearly

Note: summary of data from NOAA's US Earthquake Intensity Database and other sources, referenced in Appendix D.
Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

Earthquakes are caused "by a sudden slip on a fault."[38] Energy waves, produced when a tectonic plate overcomes friction, cause the experience of shaking. There are several faults located in northern Illinois (although there are no known faults in Stephenson County).

Illustration 3.2.1: Northern Illinois Faults[39]

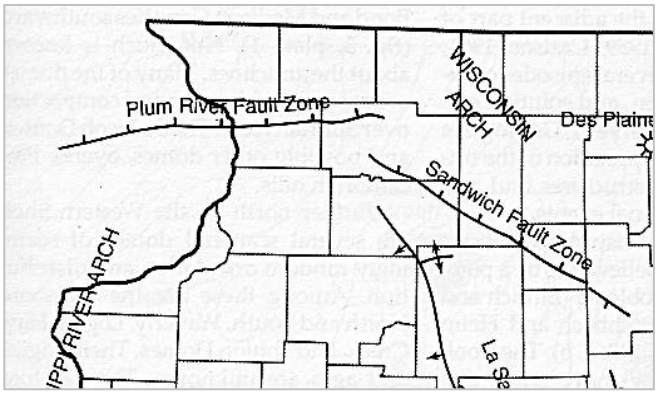
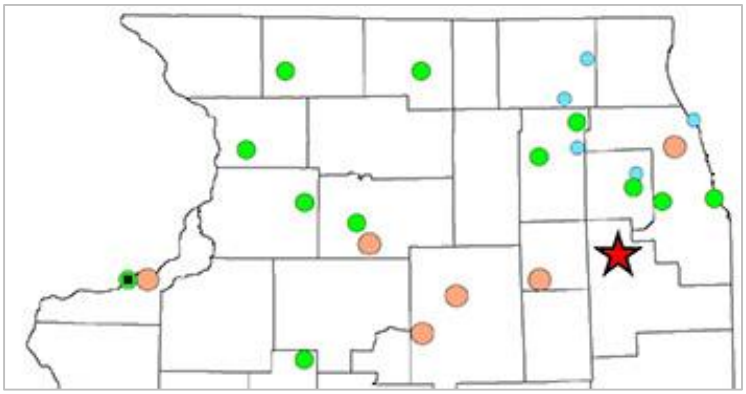


Illustration 3.2.2: Northern Illinois Earthquakes: 1795-2015[40]



Note: aqua dot = 2 to 2.9, green dot = 3 to 3.9, peach dot = 4 to 4.9, and red star = 5 to 5.4 magnitude

[38] "Earthquakes, Plate Tectonics, Earth Structure," USGS FAQs, USGS, last accessed February 2, 2016
[39] "Earthquake Maps," ISGS, last accessed March 3, 2016 (map credited to John W. Nelson, printed in "Structural Features In Illinois," Bulletin 100, ISGS)
[40] "Earthquakes in Illinois: 1795-2015," ISGS, last accessed March 3, 2016

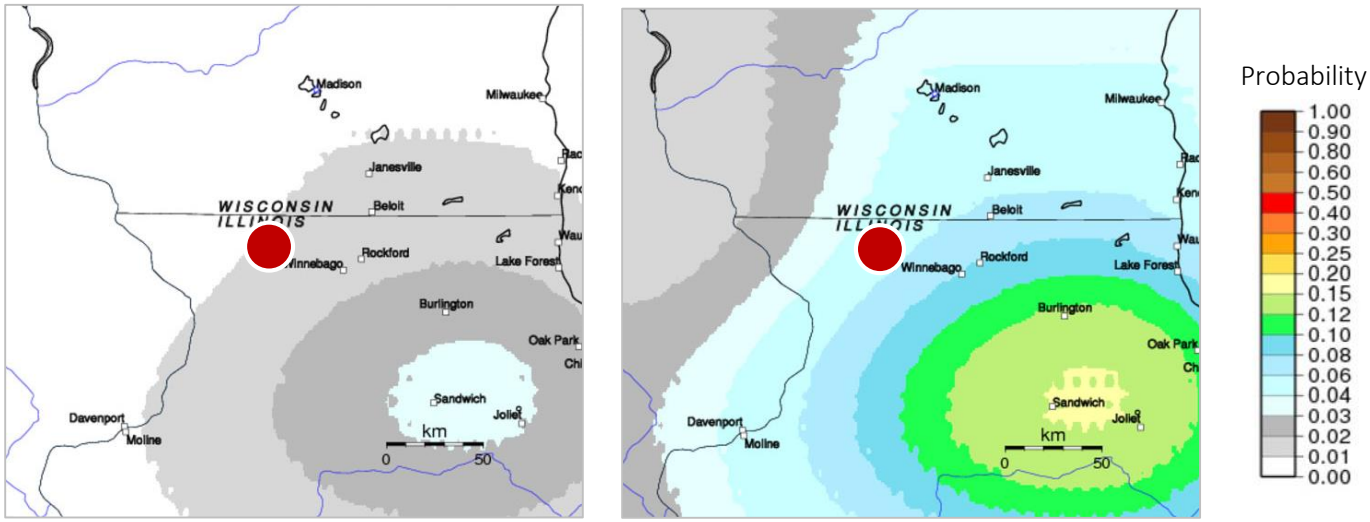
The Plum River Fault Zone and Sandwich Fault Zone, closest to Stephenson County, are understood to have been inactive for decades. Within the last ten years or so, minor earthquakes have originated from previously unknown or unmapped faults in the region. Intensity of an earthquake is determined by the Modified Mercalli Intensity Scale, which is based on observable earthquake damage; it "measures the strength of shaking produced… at a certain location."[41] The scale ranges from I (not felt) to XII (extreme). Magnitude is determined by the Richter Scale; it "measures the energy released at the source of the earthquake."[42] Typically, a magnitude of 5 corresponds with a Modified Mercalli Intensity Scale of VI to VII.

Table 3.9: Mercalli and Richter Scales[43]

Mercalli Intensity	Description	Richter Magnitude (approximate range)
I	Detected only by sensitive instruments	0 to 1.6
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	1.6 to 2.2
III	Felt noticeably indoors, but not always recognized as earthquake	2.2 to 2.8
IV	Felt indoors by many, outdoors by a few; at night, some may awaken; dishes, windows, doors disturbed	2.8 to 3.4
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.4 to 4.0
VI	Felt by all; falling plaster and chimneys; damage small	4.0 to 4.6
VII	Damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.6 to 5.2
VIII	Panel walls thrown out of frames; walls, monuments, and chimneys fall; sand and mud ejected	5.2 to 5.9
IX	Buildings cracked, thrown out of plumb, shifted off foundations; ground cracked; underground pipes broken	5.9 to 6.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, and landslides	6.5 to 7.1
XI	Few structures remain standing; bridges destroyed, ground fissures	7.1 to 7.7
XII	Damage total; waves seen on ground surface; lines of sight and level distorted; objects thrown up in air	7.7 or greater

Within a time span of 100 and 500 years, the probability of an earthquake with a magnitude of greater than 5.0 impacting central Stephenson County is approximately 2% and 6%, respectively (using USGS's 2009 earthquake probability mapping tool).

Illustration 3.3: Greater than 5.0 Earthquake Probability – 100 years and 500 years[44]



Note: a red dot represents Stephenson County

[41] "Magnitude/Intensity Comparison," USGS, last accessed February 5, 2016
[42] "Magnitude/Intensity Comparison," USGS, last accessed February 5, 2016
[43] "Facts about the New Madrid Seismic Zone," Missouri Department of Natural Resources, last accessed March 22, 2016
[44] "2009 Earthquake Probability Mapping," USGS, updated May 19, 2015

Earthquakes can cause catastrophic damage. Areas that experience earthquakes infrequently (such as Stephenson County and northern Illinois) are often less prepared to cope with the hazard event and its aftermath. Lack of preparation can increase risk and contribute to the vulnerability of people and structures. The Association of Bay Area Governments (ABAG), based in California, provides information about the characteristics of certain building types that might leave them susceptible to shaking (and possible remedies).

Table 3.10: Commercial Building Types and Earthquake Vulnerability[45]

Type	Characteristics	Expected Damage	Retrofit Approach
Unreinforced Masonry Buildings	No steel reinforcing within a masonry wall. Anchorage of the wall to the floor and roof is generally missing and the mortar is typically of low strength.	May incur substantial damage including severely cracked or collapsed walls. Separation may also occur between the floors and the walls, jeopardizing the vertical support of roof and floor systems, leading to collapse.	Includes tying walls to floor and ceiling elements or anchoring unsupported masonry walls, installing bracing, or applying overlays to the walls to add strength.
Tilt-Up Concrete Buildings	Tilt-ups are relatively cheap and fast to build, and are common as warehouses, strip malls, and light industrial facilities. Many tilt-up warehouses have also been repurposed as offices, recreational facilities, and even schools or assembly buildings.	Typically when the walls are rigid and the roof is flexible, the connection between the roof and walls fail and the wall panels can fall away from the building, causing the roof to collapse into the building.	Bracket the walls to the roof, which reduces the chances of the walls separating from the roof and collapsing.
Non-Ductile Concrete Frame Buildings	Concrete structures need embedded steel reinforcing bars to add ductility, or the ability to bend without breaking.	Lateral movement from earthquake shaking can put too much strain on non-ductile concrete buildings, pushing them past their breaking point and causing catastrophic collapse.	Includes jacketing or wrapping concrete structural columns to improve strength and ductility of the columns or adding interior walls to increase the strength and ductility of the entire structure. Non-ductile concrete structures often require sophisticated engineering for evaluation or retrofit design.
Non-Structural Elements	Non-structural external building components such as chimneys, brick veneer, concrete cladding, parapets, or decorative features can pose falling hazards during an earthquake. Internal non-structural elements within the building including HVAC equipment, shelving and other furniture, windows, and light fixtures may also be hazardous.	External components can become detached from the building, threatening people below. Interior elements may fall and injure occupants, impede evacuation or access to injured people, or, if the elements themselves sustain damage, can take a building out of service.	Restraints and braces can be used to attach furniture, HVAC, and other equipment to structural elements. Bolting and additional means of attachment can be used for external decorative elements.

Note: as described by ABAG, "other vulnerable construction types include soft-story wood frame buildings, which typically have large wall openings in the form of garages or storefronts on the ground floor, making the first story vulnerable to collapse in an earthquake.

Earthquake Scenario – Countywide[46]

HAZUS-MH, a regional multiple hazard loss estimation system developed by FEMA and the National Institute of Building Sciences (NIBS), was used to produce earthquake loss estimates.

A 6.0 magnitude probabilistic earthquake scenario analysis completed for Stephenson County predicted the following:

- 0 buildings completely damaged (beyond repair)
- 50 buildings moderately and extensively damaged
- 169 buildings slightly damaged

219 buildings represents 1.04% of the total buildings in the county.

[45] "Guide to Earthquake Vulnerable Commercial Building Types," Association of Bay Area Governments: Resilience Program, last accessed March 16, 2016

[46] Analysis using HAZUS-MH and ESRI ArcGIS was performed by Blackhawk Hills Regional Council.

By building type, the largest fraction of the damaged (60% of slightly, 73% of moderately, and 89% of extensively damaged buildings) were constructed of unreinforced masonry, suggesting that this building type is at the highest risk for earthquake damage. One household is estimated to be displaced and require shelter, and a casualty count of one person is given.

Table 3.11.1: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	354	1.69	5	3.2	2	3.68	0	4.19	0	2.5
Commercial	1,150	5.48	16	9.76	5	10.2	1	11.52	0	8.1
Education	32	0.15	0	0.29	0	0.33	0	0.38	0	0.4
Government	42	0.2	1	0.3	0	0.31	0	0.34	0	0.34
Industrial	333	1.59	5	2.81	1	2.99	0	3.34	0	1.99
Other Residential	1,927	9.19	30	17.71	8	16.97	0	7.46	0	5.62
Religion	118	0.56	2	0.98	1	1.13	0	1.32	0	1.2
Single Family	17,021	81.14	110	64.95	29	64.38	3	71.47	0	79.85
Total	20,977		169		46		4		0	

Table 3.11.2: Expected Building Damage by Building Type

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	14,462	68.94	30	18.05	3	5.81	0	0	0	0
Steel	611	2.91	8	4.84	2	4.89	0	4.62	0	0
Concrete	339	1.62	4	2.18	1	1.34	0	0.71	0	0
Precast	174	0.83	2	1.44	1	2.6	0	3.61	0	0
Reinforced Masonry	67	0.32	1	0.42	0	0.59	0	0.59	0	0
Unreinforced Masonry	4,485	21.38	101	59.99	33	72.61	4	88.5	0	100
Manufactured Housing	839	4	22	13.08	6	12.17	0	1.97	0	0
Total	20,977		169		46		4		0	

In this scenario, so-called "essential facilities" (hospitals, schools, EOCs, police stations, and fire stations) are projected to not be significantly impacted. Similarly, calculations show negligible economic loss related to essential utility systems (i.e., transportation, utility lifelines, and natural gas pipelines).

Notably, the above figures have the potential to increase sharply with an increase in magnitude.

Summary of Earthquake Impacts & Vulnerabilities

- All Cities (Freeport) and All Villages (Cedarville, Dakota, Davis, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, and Winslow): municipal water/wastewater infrastructure, transportation (including US 20 in Lena/Freeport, IL 26 in Orangeville/Cedarville/Freeport, IL 73 in Winslow/Lena/Pearl City, IL 75 in Dakota/Rock City/Davis; CN rail in Lena/Freeport), public and private buildings, private energy infrastructure, unreinforced masonry buildings
- Stephenson County: municipal water/wastewater infrastructure, transportation (including US 20, IL 26, IL 73, IL 75; CN rail), public and private buildings, private energy infrastructure, unreinforced masonry buildings

See *Table 3.38: Assets, Vulnerabilities, and Risks by Community*, *Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County*, and *Maps 3.2 - 3.11 for other vulnerabilities.*

HAZARD PROFILES: EXTREME TEMPERATURES

Extreme Temperatures Overview

Extreme temperature is a moderately frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.12.1: Typical Characteristics of Extreme Temperatures

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands in damage to property	Countywide	-30°s to 110°s (Fahrenheit)	Hours	Hours to days

Table 3.12.2: Extreme Temperatures Event Summary

Events	Damages	Frequency (Probability)
11 extreme cold/wind chill and excessive heat events recorded since 1996	$0.00k	Moderate probability of occurring (30%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

The Centers for Disease Control (CDC)'s "Extreme Heat Prevention Guide" indicates that "conditions of extreme heat are defined as summertime temperatures that are substantially hotter and/or more humid than average for location at that time of year." Dehydration, heat exhaustion, heat stroke, and death are possible consequences. Likewise, extreme cold may be thought of as wintertime temperatures that are substantially colder than average for location at that time of year. Such conditions can lead to frostbite, hypothermia, and death. At the extremes, temperatures in Illinois have spiked to 117 degrees F (East St. Louis, IL) and been as low as -36 degrees F (Congerville, IL).[47]

Special needs populations are especially susceptible to extreme temperatures, including individuals with a physical or mental impairment, the socioeconomically disadvantaged, and the elderly/senior citizens. Given demographic trends for the region and the United States, individuals 65 or older (i.e., those typically eligible for Medicare benefits) will continue to make up a sizable percentage of Stephenson County's population. Providing for these individuals as they continue to age will be a challenge for first responders, emergency management, and health care providers.

Table 3.13: County Population Totals by Age[48]

Age	2000 Population	2010 Population
Below 55	36,110	32,345
55 and Above	12,869	15,366

Note: information about patients treated for extreme cold/wind chill and excessive heat events was provided in the 2008 plan. It was collected as part of a special research project, separate from the hazard mitigation planning process. Recent information is not readily available for comparison.

[47] "Statewide Records and Normals for Illinois," ISWS, last accessed March 23, 2016

[48] "SF 1 - Profile of General Demographic Characteristics: 2000 Census," "DP-1 - Profile of General Population and Housing Characteristics: 2010," US Census Bureau's American Fact Finder, last accessed February 5, 2016

Summary of Extreme Temperatures Impacts & Vulnerabilities

- All Cities (Freeport) and All Villages (Cedarville, Dakota, Davis, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, and Winslow): municipal water/wastewater infrastructure, underground utilities, transportation surfaces/substrates, aging population, hospital capacity in Freeport
- Stephenson County: municipal water/wastewater infrastructure, underground utilities, transportation surfaces/substrates, aging population

See *Table 3.38: Assets, Vulnerabilities, and Risks by Community*, *Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County*, and *Maps 3.2 - 3.11 for other vulnerabilities.*

HAZARD PROFILES: FLOODING (& RELATED)

Photo 2: June 2008 flooding in Stephenson County – source: SCEMA

Flooding Overview

Flooding is a frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.14.1: Typical Characteristics of Flooding

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands to millions in damage to property	Countywide, especially near the municipalities of Winslow, Pearl City, Orangeville, and Freeport	13 feet to 19.76 feet or greater (varies by location)	Minutes to days	Hours to weeks

Table 3.14.2: Flooding Event Summary

Events	Damages	Frequency (Probability)
172 flooding events recorded since 1914*	$2,082.00k	High probability of occurring (85%) yearly*

*Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high). * = Considers streamgage and NCDC data.*

Flooding is the only location-specific natural hazard that occurs in Stephenson County (other natural hazards experienced by county residents and workers can originate anywhere and typically impact geographic areas indiscriminately with respect to borders). Risks associated with flooding are as follows:

- Human injury or death
- Crop and property damage
- Livestock injury or death
- Soil erosion and runoff
- Business/economic disruption
- Transportation system disruption

Some officials and residents have argued that flooding constitutes the greatest threat to Stephenson County. However, buyout and voluntary relocation projects have minimized certain risk to life and property.

Stephenson County is primarily susceptible to the following type of flooding:

Table 3.15: Types of Flooding – Stephenson County[49]

Type	Characteristics
River Flood	Occurs when water levels rise over the top of river banks due to excessive rain from… persistent thunderstorms over the same area for extended periods of time, combined rainfall and snowmelt, or an ice jam.
Inland Flooding	Occurs when moderate precipitation accumulates over several days, intense precipitation falls over a short period, or a river overflows because of an ice/debris jam or dam/levee failure.
Flash Flood	Caused by heavy or excessive rainfall in a short period of time, generally less than six hours.

The next few sections of this hazard profile defines important terms, addresses past flooding projects/programs, explains particular flooding issues by community, and examines possible flooding scenarios.

What is a floodway?

FEMA defines a regulatory floodway as a "channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height" and points out that "communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations." FIRMs, which are produced by FEMA, are used to delineate flood zones. Zones are named by letters (e.g., A, AE, D, X, etc.) and are designated according to probability of a particular level of flooding occurring.

Table 3.16: FIRM Panels – Updates[50]

3/3/2011 Unincorporated Stephenson County	3/16/2015 Unincorporated Stephenson County	3/16/2015 Winslow	3/3/2011 Pearl City	3/3/2011 Freeport	3/16/2015 Freeport
17177C0150C	17177C0175D	17177C0156D	17177C0289C	17177C0314C	17177C0308D
17177C0225C	17177C0200D				17177C0328D
17177C0250C	17177C0325D				17177C0312D
17177C0275C	17177C0350D				17177C0316D
17177C0300C	17177C0375D				17177C0316D
17177C0425C					17177C0337D
17177C0450C					17177C0318D
					17177C0319D
					17177C0338D
					17177C0339D

Note: FIRM panels for areas near Baileyville (17177C0475C) and German Valley (17177C0500C) have not yet been printed online.

NFIP Compliance

Each municipality and the county relies on its respective floodplain ordinance (and, if available, stormwater management ordinance, erosion management ordinance, and comprehensive plan/future land use map) to direct development away from floodways/floodplains. Recent FIRM updates occurred in 2011 (for part of Freeport, parts of unincorporated Stephenson County, and Pearl City) and 2015 (for all other NFIP-participating jurisdictions). Within the next five years, individual jurisdictions will, with the assistance of SCEMA, continue to review floodplain ordinances and determine whether modifications are necessary to remain compliant with NFIP and/or address changes in local conditions. This process will be undertaken primarily during yearly progress updates described in Chapter 5. Communities covered by new FIRMs that have not yet updated their floodplain ordinances are in the process of doing so via model ordinance

[49] "Severe Weather 101: Flood Types," National Severe Storms Laboratory (NSSL), NOAA, last accessed March 23, 2016
[50] "Flood Map Service Center: Search by Address," FEMA

provided by SCEMA. The month and year when current floodplain ordinances were adopted or updated are included in Table 3.1: Capabilities by Community (when available).

Repetitive Loss Properties Overview

As part of a comprehensive risk assessment, FEMA requires that plans "address NFIP insured structures that have been repetitively damaged by floods."[51] As defined by FEMA, a "Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by NFIP within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP."[52]

IEMA confirms zero RL properties in Stephenson County between 2005 and 2015. The following table includes all repetitive losses officially recorded in Stephenson County from 1978 to 2015.

Table 3.17.1: Repetitive Losses Countywide (January 1, 1978 to December 31, 2015)

Community Name	Community Number	Building Payments ($)	Contents Payments ($)	Total Payments ($)	Average Payment ($)	Losses	Properties
Freeport	170640	45,914.22	11,092.20	57,006.42	4,750.54	12	5
Stephenson County	170639	34,287.82	0.00	34,287.82	8,571.96	4	2

Note: data provided by IEMA.

The following table includes all losses in Stephenson County, including all NFIP-participating jurisdictions, from 1978 to 2015. Some new losses, especially in Freeport (from 38 to 65) and unincorporated Stephenson County (from 20 to 31), were recorded since the 2008 plan was published.

Table 3.17.2: Losses Countywide (January 1, 1978 to December 31, 2015)[53]

Community Name	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments ($)	Policies in Force	Insurance In-Force Whole $	Written Premium In-Force ($)
Cedarville	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dakota	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freeport	65	48	0	17	429,601.64	69	9,699,300	41,088
Lena	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Orangeville	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pearl City	1	0	0	1	0.00	3	908,000	10,723
Ridott	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Winslow	3	1	0	2	23,396.56	23	1,887,200	7,192
Stephenson County	31	22	0	9	275,870.36	63	6,246,900	61,451

*Terms are defined as follows: **total losses** - all losses submitted regardless of the status; **closed losses** - losses that have been paid; **open losses** - losses that have not been paid in full; **CWOP losses** - losses that have been closed without payment; **total payments** - total amount paid on losses; **policies in-force** - policies in force on the "as of" date of the report; **insurance in-force** - the coverage amount for policies in force; **written premium in-force** - the premium paid for policies in force.* [54]

[51] 44 CFR §201.6(c)(2)(ii)
[52] "National Flood Insurance Program: Frequently Asked Questions - Repetitive Loss," FEMA, last accessed December 17, 2015
[53] "Loss Statistics," and "Policy Statistics," FEMA, last accessed February 17, 2016
[54] "Data Definitions," Bureau Net, FEMA, last accessed February 17, 2016

Community Rating System Overview

Part of NFIP, the Community Rating System (CRS) "is designed to encourage local governments to do more to reduce flood losses, protect their residents, and improve flood insurance coverage. By earning points for activities that exceed NFIP standards, CRS communities obtain reductions in flood insurance premiums for their residents."[55] Neither the county nor municipalities in Stephenson County are enrolled in the program.

FEMA notes[56] that participation in CRS requires, in general, the following from a community with one or more RL properties:

- Mapping the RL area(s)
- Reviewing/describing repetitive loss problems experienced in the RL area(s)
- Listing addresses of all properties with insurable buildings in the RL area(s)
- Annual outreach to the addresses in the RL area(s)
- For communities with ten or more RL properties: preparing a floodplain management plan or area analyses for RL area(s)

The above requirements apply to Category B and Category C RL communities. Category A RL communities – i.e., communities with no RL properties/communities where all RL properties have been mitigated – "[have] no special requirements except to submit information to update [their] repetitive loss list[s], as needed."[57]

As noted in the "Repetitive Loss Properties Overview," no repetitive losses have occurred in Stephenson County from 2005-2015. This fact alone should not discourage participation in CRS.

[55] "A Strategic Plan for the Community Rating System," FEMA, published 2008
[56] "National Flood Insurance Program Community Rating System Coordinator's Manual," FEMA, published 2014
[57] Ibid

Pecatonica River Flooding Impacts

There have been at least 128 flood crests recorded on the Pecatonica River since 1914. Crests have ranged from 13 feet (flood stage) to 19.76 feet (record height). The National Weather Service defines flood crest as the maximum height of a flood wave as it passes a certain location. Locally, this "certain location" is the Pecatonica River streamgage at Freeport. The streamgage at Martintown, WI, has also been used for measure and comparison.

Photo 3: Pecatonica River flooding in July 2010 – source: SCEMA

Especially susceptible to Pecatonica River flooding are the following areas in the City of Freeport: the East Side, properties in the Arcade area west of the river, and properties near Lancaster Rd/Van Buren Rd to the north of the river. In the past, residences and businesses have been inundated or surrounded by the river's flood waters. Outside of Freeport, the Village of Winslow has experienced flooding in its historic central business district (CBD). Additionally, the Village of Orangeville has seen flooding just west of its historic CBD.

Photo 4: Undated Pecatonica River flooding in Winslow

Because the Pecatonica River crosses the Illinois-Wisconsin border, some consideration has been given to the creation of a so-called Pecatonica River Watershed Alliance. Such alliance is envisioned to explore best river and stormwater management practices and include government officials, as well as individuals and organizations representing emergency management, economic development, environment, and recreation stakeholders. To date, there has been limited traction in the creation of such alliance. This effort should be explored again within the next five years of the current plan.

The following table outlines the impacts of Pecatonica River flooding in Freeport, Winslow, and outlying areas. Greater details are provided in this chapter's "Summary of Flooding Impacts & Vulnerabilities."

Table 3.18: Pecatonica River Height and Impact (measured at Freeport streamgage)[58]

Height (ft)	Impact
11	Some agricultural flooding occurs north of Freeport.
11.5	River at action stage.
13	River at flood stage. Water affects low-lying sections of Freeport, mainly east of the Pecatonica River.
14	Moderate flood stage. Minor street flooding in Freeport (including streets located off IL 75); affects a few backyards east of the Pecatonica River in Freeport. Also affects railway in Freeport and former railway in Ridott. The intersection of Van Buren Rd and Lancaster Rd, just north of Freeport, is also impacted.
15	Water affects several streets in Freeport; affects many backyards in Freeport east of the Pecatonica River. Impacts the lowest section of IL 75 in Freeport, as well as US 20 east of Freeport. Water begins to reach southeast corner of Taylor Park.

[58] Information from SCEMA and "Pecatonica River at Freeport," Advanced Hydrologic Prediction Service, National Weather Service, last accessed January 19, 2016

Height (ft)	Impact
15.5	Numerous street closures north and south of IL 75. Water enters Taylor Park and first floors of homes in Freeport. Businesses along Van Buren St north of the Pecatonica River are impacted.
16	Major flood stage. Water affects business parking lots east of the Pecatonica River near the Stephenson St bridge and much of Taylor Park in Freeport. Most streets north and south of IL 75 are closed, as is the highway.
16.5	Water surrounds Taylor Park School and affects IL 75 east of Freeport.
17	Water affects other business parking lots near the Stephenson St bridge in Freeport.
17.5	IL 73 is flooded in Winslow.[59]
19	Water affects businesses west of the Stephenson St bridge in Freeport; also impacts the former train depot.
19.76	Record river height.
20	Water reaches the bottom of the Stephenson St bridge deck in Freeport.
21.5	Water reaches the bottom of the IL 26 bridge deck in Freeport.

Yellow Creek Flooding Impacts

In recent years, as well as historically, flooding has also occurred along Yellow Creek. Although there are no streamgages to measure the water levels on Yellow Creek, its crests have been significant, as evidenced by photos, videos, and first responder/emergency management recollections.

Photo 4: March 2013 Yellow Creek flooding, south Freeport – source: SCEMA

In particular, Yellow Creek flooding in 2013 surprised many when it submerged commercial and government properties in south Freeport. For casual observers and perhaps some officials, these were properties that seemed unlikely to flood (as a partially related consequence, Freeport's Fire Station #3 was closed and replaced with Central Fire Station). It should be noted that although ice jams can cause seasonal flooding, the creek has been known to spill its banks without the jams. Outside of Freeport, major Yellow Creek flooding impacted Pearl City in 2010 and 2011.

Screen capture: July 2010 Yellow Creek flooding, Pearl City

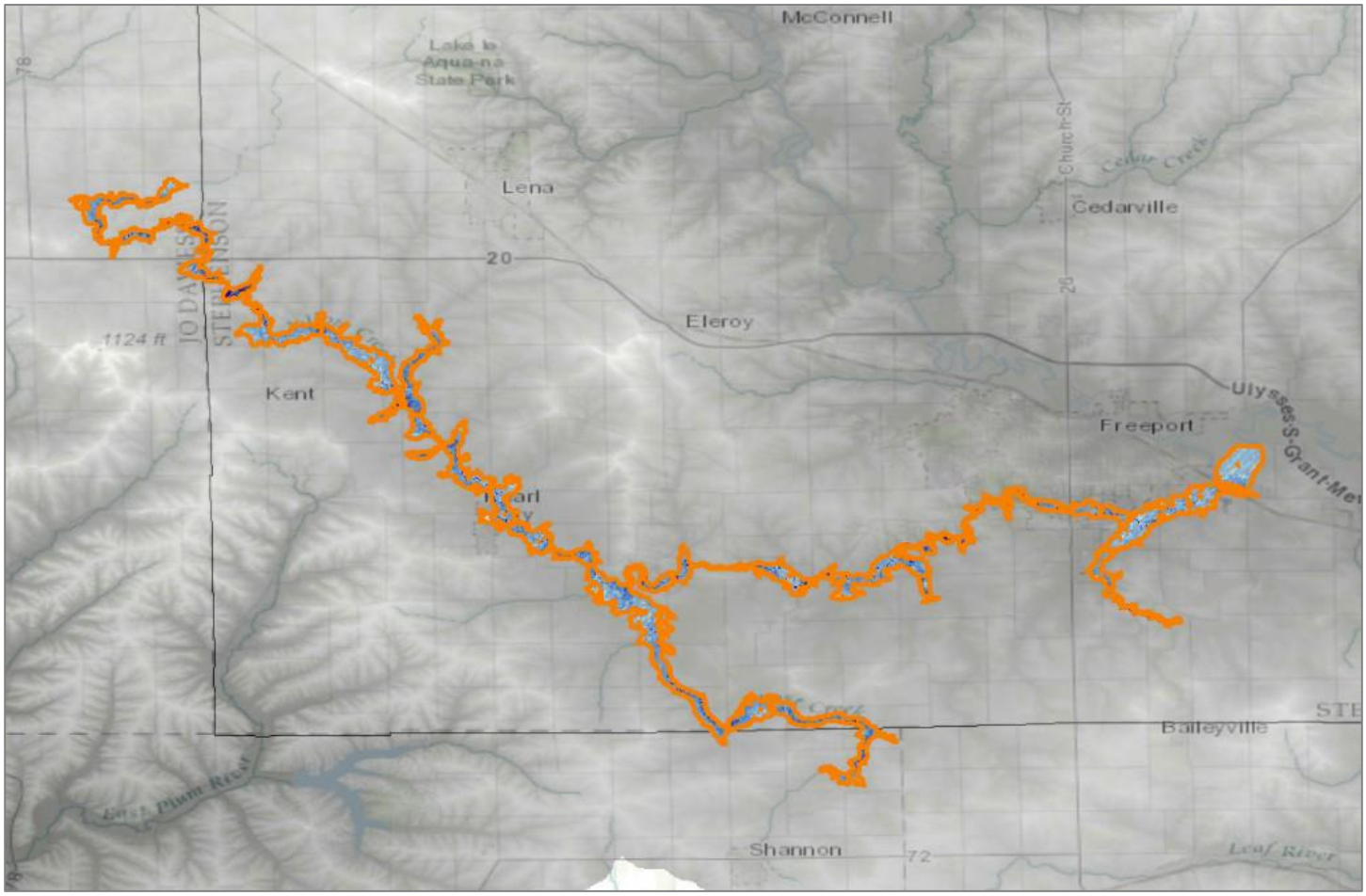
Given the creek's history of unpredictability, current and previous emergency management officials strongly recommend and wish to pursue the placement of an additional streamgage along Yellow Creek, possibly near or in Freeport. Any new placement will require coordination with the USACE and USGS, as well as potential cost-share to cover maintenance.

[59] "Pecatonica River at Martintown, WI," Advanced Hydrologic Prediction Service, National Weather Service, last accessed January 19, 2016

Flooding Scenario: Yellow Creek Corridor[60]

HAZUS-MH was used to assess building damage from flooding near Yellow Creek in Stephenson County. It included analysis of the 10, 50, 100, and 500-year flood events.

Illustration 3.4: HAZUS-MH Scenario Area – Yellow Creek Floodway/Floodplain – Stephenson County



Note: delineated by HAZUS-MH.

HAZUS-MH draws from US Census data to make calculations and generate reports. In 2010, the bureau estimated a count of 21,196 buildings countywide, with a total building replacement value (excluding contents) of over $6 billion (in 2010 dollars). Approximately 90% of the buildings countywide are residential; 69% of the countywide building replacement value is residential. The scenario area has a similar proportion of residential and commercial exposure when compared to the county at large. However, the same area contains a higher proportion of industrial exposure than the county at large.

[60] Analysis using HAZUS-MH and ESRI ArcGIS was performed by Blackhawk Hills Regional Council.

Table 3.19: Countywide and Scenario Exposure – Stephenson County

Type	Countywide Potential Exposure ($)	Percent of Total	Scenario Potential Exposure ($)	Percent Total
Residential	4,308,192,000.00	69.00%	247,393,000.00	65.50%
Commercial	1,187,296,000.00	19.00%	71,731,000.00	19.00%
Industrial	338,371,000.00	5.40%	43,793,000.00	11.60%
Agricultural	116,785,000.00	1.90%	10,197,000.00	2.70%
Religion	144,714,000.00	2.30%	1,962,000.00	0.50%
Government	43,784,000.00	0.70%	1,736,000.00	0.50%
Education	104,406,000.00	1.70%	1,024,000.00	0.30%
Total	6,243,548,000.00	100.00%	377,836,000.00	100.00%

As one might expect, HAZUS-MH calculated that the 500 and 100-year flood events would be the most destructive, in that more buildings were damaged and at greater severity. Zero buildings were estimated to be substantially damaged (greater than 51% damage) in any of the four scenarios.

Table 3.20: Residential Damage by Scenario – Stephenson County

Intensity	Building Count at 1-10% Damage	Building Count at 11-20% Damage	Building Count at 21-30% Damage	Building Count at 31-40% Damage	Building Count at 41-50% Damage	Building Count at 50%+ Damage	Total Count
500-year	12	34	11	4	1	0	62
100-year	13	34	9	1	0	0	57
50-year	16	31	7	1	0	0	55
10-year	17	21	2	0	0	0	40

Building-Related Losses

Building-related loss is the estimated cost of repairing or replacing damaged buildings and contents. With respect to building, content, and inventory losses, HAZUS-MH calculated steadily increasing losses by scenario severity.

Specifically, with the base 10-year flood, HAZUS-MH calculates $10.6 million in total building damage. The 50-year flood scenario calculation is $15.7 million, a 48% increase in damage. The 100-year flood scenario calculation is $17.5 million in damage, a 70% increase from the base 10-year scenario. Finally, the 500-year flood scenario calculation is $20.67 million in damage, a 104% increase from the base 10-year scenario.

Table 3.21.1: Calculated Building-Related Losses in 10-year Flood

	Building Loss ($)	Content Loss ($)	Inventory Loss ($)	Subtotal ($)
Residential	3,620,000.00	1,630,000.00	0.00	5,250,000
Commercial	740,000.00	2,370,000.00	80,000.00	3,190,000
Industrial	350,000.00	1,030,000.00	140,000.00	1,530,000
Others	90,000.00	550,000.00	10,000.00	650,000
Total	4,800,000.00	5,580,000.00	230,000.00	10,620,000

Table 3.21.2: Calculated Building-Related Losses in 50-year Flood

	Building Loss ($)	Content Loss ($)	Inventory Loss ($)	Subtotal ($)
Residential	5,290,000.00	2,350,000.00	0.00	7,640,000
Commercial	1,070,000.00	3,500,000.00	110,000.00	4,670,000
Industrial	580,000.00	1,540,000.00	210,000.00	2,330,000
Others	160,000.00	910,000.00	20,000.00	1,090,000
Total	7,100,000.00	8,290,000.00	340,000.00	15,730,000

Table 3.21.3: Calculated Building-Related Losses in 100-year Flood

	Building Loss ($)	Content Loss ($)	Inventory Loss ($)	Subtotal ($)
Residential	5,850,000.00	2,600,000.00	0.00	8,450,000
Commercial	1,180,000.00	3,870,000.00	120,000.00	5,170,000
Industrial	640,000.00	1,720,000.00	240,000.00	2,600,000
Others	190,000.00	1,030,000.00	30,000.00	1,240,000
Total	7,860,000.00	9,220,000.00	390,000.00	17,470,000

Table 3.21.4: Calculated Building-Related Losses in 500-year Flood

	Building Loss ($)	Content Loss ($)	Inventory Loss ($)	Subtotal ($)
Residential	6,970,000.00	3,120,000.00	0.00	10,090,000
Commercial	1,350,000.00	4,470,000.00	140,000.00	5,970,000
Industrial	780,000.00	2,130,000.00	290,000.00	3,190,000
Others	230,000.00	1,160,000.00	40,000.00	1,420,000
Total	9,320,000.00	10,880,000.00	470,000.00	20,670,000

Economic Losses

Economic loss arises from lost business and rental income, as well as relocation and wage expenses occurring due to flooding. The total economic loss estimated for the four flood scenarios ranges from $10.65 million, which represents 2.8% of the replacement value of the buildings in the base 10-year flood scenario, to $20.71 million, or 5.5% of the replacement value of the buildings in the 500-year flood scenario. The 50-year flood scenario has a 48% increase (above the base 10-year flood) or $15.77 million in losses, and the 100-year flood scenario has a 64% increase (above the base 10-year flood) or $17.50 million in losses. The 500-year flood scenario shows an increase from the base of 94%.

Table 3.22.1: Calculated Economic Losses in 10-year Flood

	Income Interruption ($)	Relocation Interruption ($)	Wage Interruption ($)	Subtotal ($)	Total ($)
Residential	0.00	10,000.00	0.00	10,000.00	5,260,000.00
Commercial	10,000.00	0.00	10,000.00	10,000.00	3,200,000.00
Industrial	0.00	0.00	0.00	0.00	1,530,000.00
Others	0.00	0.00	10,000.00	10,000.00	660,000.00
Total	10,000.00	10,000.00	20,000.00	30,000.00	10,650,000.00

Table 3.22.2: Calculated Economic Losses in 50-year Flood

	Income Interruption ($)	Relocation Interruption ($)	Wage Interruption ($)	Subtotal ($)	Total ($)
Residential	0.00	10,000.00	0.00	10,000.00	7,650,000.00
Commercial	10,000.00	0.00	10,000.00	20,000.00	4,690,000.00
Industrial	0.00	0.00	0.00	0.00	2,330,000.00
Others	0.00	0.00	10,000.00	10,000.00	1,110,000.00
Total	10,000.00	10,000.00	20,000.00	30,000.00	15,770,000.00

Table 3.22.3: Calculated Economic Losses in 100-year Flood

	Income Interruption ($)	Relocation Interruption ($)	Wage Interruption ($)	Subtotal ($)	Total ($)
Residential	0.00	10,000.00	0.00	10,000.00	8,460,000.00
Commercial	10,000.00	0.00	10,000.00	20,000.00	5,190,000.00
Industrial	0.00	0.00	0.00	0.00	2,600,000.00
Others	0.00	0.00	10,000.00	10,000.00	1,260,000.00
Total	10,000.00	10,000.00	20,000.00	30,000.00	17,500,000.00

Table 3.22.4: Calculated Economic Losses in 500-year Flood

	Income Interruption ($)	Relocation Interruption ($)	Wage Interruption ($)	Subtotal ($)	Total ($)
Residential	0.00	10,000.00	0.00	10,000.00	10,100,000.00
Commercial	10,000.00	0.00	10,000.00	20,000.00	5,980,000.00
Industrial	0.00	0.00	0.00	0.00	3,190,000.00
Others	0.00	0.00	10,000.00	10,000.00	1,430,000.00
Total	10,000.00	10,000.00	20,000.00	40,000.00	20,710,000.00

Summary of Flooding Impacts & Vulnerabilities

Table 3.23:  *by Community*

Community/Jurisdiction	Background	Impacts & Vulnerabilities
Stephenson County	Pecatonica River, Yellow Creek, and other waterways intersect Stephenson County. In July 2010, nearly 1,000 homes were damaged during countywide flooding. Also impacted were businesses and government facilities. Flooding occurred mostly along the Pecatonica River and Yellow Creek. The City of Freeport and Stephenson County have previously explored purchasing properties subject to flooding. Freeport in particular has pursued the acquisition of property in the floodway/floodplain when circumstances permit it. Other communities, such as Orangeville, have mitigated properties as well.	• *Transportation systems:* bridge and roadway washouts limit the reach of first responders, increase maintenance costs, and impact the movement of people and freight. • *Water quality:* growing crops immediately adjacent to waterways increases erosion and contributes to reduced water quality from fertilizer and pesticide runoff. Fertilizer and pesticide use in municipalities further exacerbates the situation.
Cedarville	Cedar Creek abuts the northern and western edges of Cedarville, and an unnamed waterway flows along the village's southern edge. The village is susceptible to flooding from both waterways. That said, due to topography (including natural bluffs), most existing development is well-isolated from flooding. Some localized ponding occurs near Cedar and Washington St, as well as near Harrison Cir and Homestead Dr.	• *Erosion management:* officials expressed concern about erosion near Oakridge Dr, a cul-du-sac roadway located in the village's western portion. • *New development:* the county's future land use plan designates commercial development in the southern portion of the village (on both sides of IL 26). Some of this area has experienced flooding or is near floodplain. Planned residential land uses border floodplain southwest, south, and northeast of Cedarville. Such uses should be reconsidered. • *Water quality:* the wastewater treatment plan is located in the floodplain, but has been protected from flooding by berms/elevation.
Dakota	Flooding is not considered a significant hazard. The village has two major north-south drainageways. One is west of school district property; the other is on the village's east side. There is occasional yard flooding. Most village drainage is over roads or into ditches and leads into the aforementioned drainageways. Locals recall an event in the late 1990s that produced 11" of rain, which caused basement flooding in residences.	• *New development:* the county's future land use plan designates blanket residential land use surrounding the city. Such development may create stormwater runoff issues; as such, the village should re-visit land use designations within the 1.5 mile planning boundary. • *Stormwater management:* development to the north may produce additional stormwater runoff. • *Water quality:* the wastewater treatment plant is located near the village's east drainageway. It may have treatment capacity issues, potentially making it vulnerable to flooding.
Davis	Flooding is not considered a significant hazard.	• Impact is limited.

Community/Jurisdiction	Background	Impacts & Vulnerabilities
German Valley	Flooding is not considered a significant hazard. Historically, the village has experienced flooding along Wickham Creek, which runs along the village's east edge. As officials consider development proposals, they should divert new construction away from this area. Some culverts may have insufficient capacity during extreme and prolonged rain events (notably, Church St).	• Impact is limited.
Lena	Flooding is not considered a significant hazard. In the past, heavy rains have resulted in basement flooding and storm sewer system backups. If development continues towards the Pecatonica River floodplain, appropriate regulation and effective stormwater management will be critical.	• Impact is limited.
McConnell (unincorporated)	Adjacent to the Pecatonica River. Nearly one-half of the community is located in floodplain/floodway.	• *People/structures in floodplain:* residential and commercial properties are located in floodplain/floodway.
Orangeville	Richland Creek cuts through the village's western half. Most land within the creek's floodplain is agricultural or public open space. The floodplain also includes Mill St and South St. A 1996 flood submerged Mill St and impacted Main St and Orangeville Rd, resulting in $100,000 in damages to Orangeville Rd. The flood also caused an estimated $500,000 in damage to ten homes and $20,000 in damage to two mobile homes. Lesser flooding occurred in 2000. Property acquisition has occurred in flood-prone areas since 1996. In July 2014, it was reported that seven flood-impacted properties would be purchased using FEMA funds, furthering mitigation efforts.	• *Bridge washouts:* the Orangeville Rd bridge is susceptible to washouts; washouts limit western access in and out of the village. • *Constrained waterway:* the bridge at Orangeville Rd, which constrains Richland Creek, can exacerbate flooding during major flooding events. Bends or blockages in the creek may also have the effect of increasing the frequency, severity, or duration of flooding in the village. • *People/structures in floodplain:* most threats to life and property have been mitigated, however some residential/commercial structures remain in the floodplain. • *Water quality:* the wastewater treatment plan is located in the floodplain, but has been protected from flooding by berms/elevation; historically, private wells and septic systems have flooded, especially along Freeport St.

Community/Jurisdiction	Background	Impacts & Vulnerabilities
Pearl City	Pearl City is subject to Yellow Creek and Goldmine Rd tributary flooding. Some flooding occurs during the winter and spring when ice jams dam waterways. Other flooding events are the result of intense rainfall. In June 2000, roughly one-half of the village was submerged. Significant flooding also occurred in June 2001, and, in August 2002, flooding damaged numerous homes, led to the evacuation of twenty-two residents, and flooded the sewage treatment plant. In July 2010, eighty homes were damaged by flooding in Pearl City. In July 2011, the village was again subject to significant flooding, which impacted residences and IL 73. In general, many homes continue to experience basement flooding. Local officials estimate that multiple "100-year" and "500-year" floods have occurred in the past few decades. Although the village left NFIP in the late 1980s, it has since rejoined (having experienced flooding events after leaving NFIP).	• *Bridge washouts:* the Pearl City Rd bridge is susceptible to flooding; passage in and out of the village is limited during major flooding events. • *Constrained waterway:* bridges crossing Yellow Creek at Pearl City Rd and IL 73 north of the village have constrained water flow during flooding events. • *People/structures in floodplain:* a property acquisition program is being finalized; it awaits funding from the state and individual property owner acceptance. • *Stormwater management:* some property owners experience storm sewer system backups during flooding events. • *Water quality:* the wastewater treatment plan is located in the floodplain, but has been protected from flooding by berms/elevation; some brownfield sites have received no further remediation (NFR) letters.
Ridott	The Pecatonica River flows adjacent to northwest Ridott; Wickham Creek intersects the southeast portion of the village. Historically, backyards along Washington St have experienced Wickham Creek flooding.	• *Constrained waterway:* the village has identified debris in the Pecatonica River and Wickham Creek as a potential contributor to flooding. • *New development:* because of flooding concerns, development west and northwest of Jefferson St should be discouraged. • *Threats to water quality:* residents rely on private wells for water and private septic systems for wastewater treatment. There is some concern that waste from septic systems may contaminate wells during flooding/heavy rains.
Rock City	Flooding is not considered a significant hazard. Some ponding occurs in backyards and ditches during prolonged and/or heavy rain.	• *Stormwater management:* there is significant pervious surface in the historic CBD that can channel stormwater runoff towards the intersection of Main St and IL 75.

Community/Jurisdiction	Background	Impacts & Vulnerabilities
Winslow	The Pecatonica River flows through the heart of the village. Additionally, two creeks that flow into the Pecatonica River at Winslow – Indian and Cedar – experience flooding, usually when the river floods. Flooding is caused by intense rainfall, as well as snowmelt. Historical floods include 1922, 1923 1929, 1969, 1993, and 2000. Such events have primarily impacted Winslow's historic CBD. As part of mitigation (and other efforts), village hall – once located in the floodplain – has been relocated to higher ground.	• *Bridge washouts:* the Winslow Rd bridge, which crosses the Pecatonica River, has experienced flooding (up to waist deep) during major flooding events. • *Constrained waterway:* the village has identified debris in the Pecatonica River as a potential contributor to flooding. • *Critical facility:* the fire station is located in a floodplain. It can be cut off from other parts of the community, particularly the north, during major events. In the past, if a flood is anticipated, the fire department temporarily disperses fire engines to alternative sites throughout Winslow. • *Water quality:* the wastewater treatment plan is located in the floodplain, but has been largely protected from flooding by berms/elevation; a gas station located in Winslow's historic CBD is susceptible to flooding.

Community/Jurisdiction	Background	Impacts & Vulnerabilities
Freeport	The city, a significant population and government center, experiences the often seasonal and sometimes irregular rise and fall of the Pecatonica River, Yellow Creek, and other waterways in the region. The city's most economically disadvantaged populations – including homeowners in Freeport's Third Ward – experience the brunt of river/creek crests. In July 2010, 700 homes were damaged by flooding; both the Pecatonica River and Yellow Creek were contributors. At the peak of the event, entry/exit into Freeport was limited to IL 26 north of the city. *Pecatonica River* The river is unpredictable and regularly exceeds its banks during spring thaws and heavy rains. Flooding on the river is most destructive on the city's East Side and Arcade neighborhoods. Major floods have submerged portions of Freeport under several feet of water, threatened lives, and damaged property. There have been several proposals to address flooding on the city's East Side and Arcade neighborhoods. Some have been implemented successfully, including improvements related to Currier Creek, a small tributary that enters the Pecatonica River on the eastern edge of the East Side. Berming around the creek has helped divert floodwater away from the neighborhood during minor flooding. Other proposals are on hold or have been dropped for various reasons. Over the years, these have included: • Constructing a major levy (technical analysis revealed it would create more problems than it would solve) • Digging stormwater basins (selected areas had soil contamination due to past industrial activities) • Voluntary relocation of residents/neighborhoods (a relocation proposal was abandoned after it garnered inadequate support following inadequate outreach). *Yellow Creek* A tributary of the Pecatonica River that runs west to east through the southern edge of Freeport. Waters can exceed Yellow Creek's banks, particularly when the Pecatonica River is at flood stage.	• *Constrained waterways:* many believe that Yellow Creek flooding could be reduced if debris, such as fallen trees, was regularly removed. In addition, bridges (like the Walnut Rd bridge) constrain water flow and can contribute to ice jams. • *New development:* development pressure has subsided somewhat, although construction near Yellow Creek and other waterbodies remains potentially problematic. • *Planning and regulatory:* most of the city's East Side neighborhood is located in floodway/floodplain, as designated by FEMA. Such designation carries relatively strict regulations intended to limit improvements and new development. Such regulations have been a source of frustration for some East Side residents. • *Stormwater management:* combined sewer overflows, less than ideal water channeling, and poor detention/retention practices exacerbate flooding. • *Transportation systems:* roadway and bridge closures, washouts, and general flooding impact economic activity, structural integrity, and quality of life in areas with low-income and elderly residents. Washouts have impacted several bridges over Yellow Creek (the Gladewood Dr bridge has since been restricted to pedestrian access), IL 26, and a private railroad bridge. • *Water quality:* contaminants are exposed when yards, basements, and structures are flooded.

HAZARD PROFILES: SEVERE THUNDERSTORMS (& RELATED)

Thunderstorms Overview

Severe thunderstorms are a frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.24.1: Typical Characteristics of Severe Thunderstorms

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands to millions in damage to property	Countywide	Wind gusts of at least 58 mph or greater (up to 128 mph gust recorded in neighboring Wisconsin) Up to 16.91 inches of rain in 24-hours in Aurora, IL	Minutes to hours	Minutes to hours

Table 3.24.2: Severe Thunderstorms Event Summary

Events	Damages	Frequency (Probability)
209 thunderstorm wind, strong wind, and high wind events recorded since 1955	$8,047.00k	High probability of occurring (100%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

According to the NOAA Storm Prediction Center (SPC), a severe thunderstorm is "a thunderstorm producing hail that is at least one inch in diameter or larger, and/or wind gusts of fifty-eight mph or greater, and/or a tornado." It can cause death, injury, and/or damage to property and may result in:

- Flash flooding and flooding from rain
- Fires and electric shock from lightning
- Property damage, crop damage, and livestock injury/death from hail, strong winds, and tornadoes
- Downed trees, powerlines, and utilities from strong winds and tornadoes
- General devastation to life and property from tornadoes

Various types of winds are associated with thunderstorms, including:

Table 3.25: Types of Damaging Winds[61]

Type	Description
Straight-line wind	Any thunderstorm wind that is not associated with rotation; used mainly to differentiate from tornadic winds.
Downdraft	A small-scale column of air that rapidly sinks toward the ground.
Downburst	A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst of damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
Microburst	A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally small (less than 2.5 miles across) and short-lived, lasting only five to ten minutes, with maximum wind speeds up to one hundred and sixty-eight mph. There are two kinds of microbursts: wet and dry.

[61] "Severe Weather 101: Types of Damaging Winds," NSSL, NOAA, last accessed March 11, 2016

	• A wet microburst is accompanied by heavy precipitation at the surface. • Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
Gust Front	A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
Derecho	A derecho is a widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. A typical derecho consists of numerous microbursts, downbursts, and downburst clusters. By definition, if the wind damage swath extends more than 240 miles and includes wind gusts of at least 58 mph or greater along most of its length, then the event may be classified as a derecho.
Haboob	A haboob is a wall of dust that is pushed out along the ground from a thunderstorm downdraft at high speeds.

Severe thunderstorms are frequent in Stephenson County, particularly in the late spring and summer months. SPC explains that "May and June are the peak months for the occurrence of tornadoes and large hail [and] July and June are the top months for wind storms." Wind speeds vary by hazard event and may be categorized via Beaufort Scale, which is provided as follows:

Table 3.26: Beaufort Scale[62]

Beaufort Number	Wind Speed Estimate (mph)	Term	Description
0	0	Calm	Calm. Smoke rises vertically.
1	1-3	Light air	Wind motion visible in smoke.
2	4-7	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	Fresh breeze	Smaller trees sway.
6	25-31	Strong breeze	Large branches in motion. Whistling heard in overhead wires.
7	32-38	Near gale	Whole trees in motion.
8	39-46	Gale	Twigs broken from trees. Cars veer on road
9	47-54	Severe gale	Light structure damage.
10	55-63	Storm	Trees uprooted. Considerable structural damage.
11	64-73	Violent storm	Widespread and considerable structural damage.
12	74-95	Hurricane	Widespread and considerable structural damage.

Although few in number, more injuries and deaths in Stephenson County have been attributed to thunderstorm-related events than drought, earthquakes, flooding, and severe winter storms combined. It should be noted, however, that the number of injuries related to extreme temperature events may be greater (e.g., the combined total of those suffering from heat exhaustion, heat stroke, frostbite, hypothermia, and other associated conditions over a multi-year period).

Near Orangeville in June 2009, a tornado was reported to have touched down, impacting livestock and equipment. In June 2014, severe thunderstorms were experienced throughout the county – including in Lena, Orangeville, and McConnell. The Village of Lena suffered considerable damage as winds downed trees and electric utilities. Businesses – those with food product – also lost inventories. Another storm in September 2014 destroyed and damaged facilities at Albertus Airport.

[62] "Beaufort Wind Chart – Estimating Wind Speeds," NOAA Northern Indiana, created January 28, 2015

Tornadoes Overview

Tornadoes are a moderately frequent event, capable of countywide, path-related, multi-jurisdictional impacts.

Table 3.27.1: Typical Characteristics of Tornadoes

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands to millions in damage to property	Countywide, path-related	EF0 (65 mph) to EF5 (200+ mph)	Seconds to minutes	Minutes to hours

Table 3.27.2: Tornadoes Event Summary

Events	Damages	Frequency (Probability)
13 tornado events recorded since 1950	$2,973.00k	Moderate probability of occurring (25%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events. Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

Tornadoes are given EF numbers according to intensity, using three-second gust measures.

Table 3.28: Enhanced Fujita Scale[63]

EF Number	Intensity	Three Second Gust (mph)	Description and Examples of Damage
EF0	Gale	65-85	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	Weak	86-110	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
EF2	Strong	111-135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	Severe	136-165	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF4	Devastating	166-200	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
EF5	Incredible	200+	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 109 yards; trees debarked; incredible phenomena will occur.

In Stephenson County, tornadoes have ranged from F/EF0 tornadoes to F/EF2 tornadoes. The deadliest – an F2 from October 1958 – originated in Stephenson County and traveled east into present-day Chicagoland.

[63] Multiple sources, primarily the "Fujita Tornado Damage Scale," NOAA, last accessed January 19, 2016

Lightning Overview

Lightning is a frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.29.1: Typical Characteristics of Lightning

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands in damage to property	Countywide, localized strike	n/a	Immediate	Seconds

Table 3.29.2 Lightning Event Summary

Events	Damages	Frequency (Probability)
4 lightning events recorded since 1996*	$55.00k	Based on thunderstorm/severe thunderstorm probability; high probability of occurring (100%) yearly

*Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events. Damages (property and crop) are estimates only and not adjusted for inflation. * = underreported. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).*

Thunderstorms produce lightning. SPC explains that "although lightning can be deadly, the NWS [does not] use it to define a severe thunderstorm[, as] every thunderstorm would be severe, by definition." The National Aeronautics and Space Administration (NASA) describes two common types of lightning: cloud-to-ground and intra-cloud. While the latter is more common, the cloud-to-ground type "is the most damaging and dangerous form."

Lightning can cause death and injury to humans and animals, set fire to buildings, and damage the power and communications grids. In an online overview of lightning injuries, researchers at the University of Illinois at Chicago write that "about one third of all injuries occur during work[,] about another third of injuries occur during recreational or sports activities[, and the] last third occurs in diverse situations, including injuries to those inside buildings."

Table 3.30: Odds of Lightning Strike[64]

Description	Odds
Odds of being struck by lightning in a given year (reported deaths + injuries)	1/700,000
Odds of being struck by lightning in a given year (estimated total deaths + injuries)	1/240,000
Odds of being struck in your lifetime (estimated lifetime of eighty years)	1/3,000
Odds you will be affected by someone being struck	1/300

[64] "Medical Aspects of Lightning," Lightning Injury Research Program, University of Illinois at Chicago, last accessed 3/16/2016

Hail Overview

Hail is a frequent event, capable of countywide, multi-jurisdictional impacts.

Table 3.31.1: Typical Characteristics of Hail

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands in damage to property	Countywide, localized fall	1" (severe criteria) to 4 1/2" or greater	Immediate	Seconds to minutes

Table 3.31.2: Hail Event Summary

Events	Damages	Frequency (Probability)
95 hail events recorded since 1996	$274.50k	High probability of occurring (90%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

NSSL defines hail as "a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice." Hail size is measured in diameter and is often described using common objects (e.g., pennies, nickels, etc.). Hail ranges in size from barely visible to softball size or larger. Peak hail season occurs in late spring and early summer.[65]

Table 3.32: Hail Size[66]

Diameter	Size Description
1/4"	Pea
1/2"	Marble/mothball
3/4"	Dime/penny
7/8"	Nickel
1" (severe criteria)	Quarter
1 1/2"	Walnut/ping-pong ball
1 3/4"	Golf ball
2 1/2"	Tennis ball
2 3/4"	Baseball
4"	Grapefruit
4 1/2"	Softball

Although human injury and loss of life is less frequent, outdoor animals can be impacted and property damage (including to vehicles) can be extensive. Related to hail, Underwriter Laboratories (UL) has created national impact ratings for roofing materials. All four classes account for severe hail size (defined as 1" or greater). The higher the rating, the greater the resistance.

Table 3.33: Impact Ratings by UL 2218 Standard[67]

Roofing Material Class	Description
Class 1	Resistance to a 1.25 inch steel ball
Class 2	Resistance to a 1.5 inch steel ball
Class 3	Resistance to a 1.75 inch steel ball
Class 4	Resistance to a 2 inch steel ball

[65] Agricultural Insurance: Theory and Practice and Application to Developing Countries, PK Ray, page 32, published 1981
[66] Multiple sources, primarily "Severe Weather 101: Hail Basics," NSSL, NOAA, last accessed March 16, 2016
[67] "Is Your Home Protected From Hail Damage?: A Homeowner's Guide to Hail Retrofit," Institute for Business and Home Safety, published 2002

Summary of Severe Thunderstorms & Related Impacts & Vulnerabilities

- All Cities (Freeport) and All Villages (Cedarville, Dakota, Davis, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, and Winslow): above-ground utilities, pole buildings, public and private buildings, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes
- Stephenson County: above-ground utilities, pole buildings, public and private buildings, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, crops and livestock

See *Table 3.38: Assets, Vulnerabilities, and Risks by Community*, *Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County*, and *Maps 3.2 - 3.11 for other vulnerabilities.*

HAZARD PROFILES: SEVERE WINTER STORMS

Severe Winter Storms Overview

Severe winter storms are a frequent, seasonal event, capable of countywide, multi-jurisdictional impacts.

Table 3.34.1: Typical Characteristics of Severe Winter Storms

Damage ($)	Location (Geographic Area)	Extent by Measure	Speed of Onset (Time)	Duration (Time)
Thousands in damage to property	Countywide, localized fall of freezing rain, sleet, and snow	Up to 36" of snow in 24-hours in Astoria, IL	Hours to days	Hours to days

Table 3.34.2: Severe Winter Storms Event Summary

Events	Damages	Frequency (Probability)
45 winter storm events recorded since 1996	$0.00k	High probability of occurring (85%) yearly

Note: summary of data from the NCDC NOAA Storm Events Database. Appendix D contains individual historical events and costs (damages). Damages (property and crop) are estimates only and not adjusted for inflation. Probability based on historical events over a 20 year period, from 1996 to 2015. 0 to 10% (low), 11% to 50% (moderate), and 51% to 100% (high).

ISWS explains that "January is the most favored month for severe winter storms, although December, February, and March are close behind..." Like severe thunderstorms, severe winter storms may include a number of related events, such as freezing rain, sleet, and snow.

Table 3.35 Types and Characteristics of Winter Storms[68]

Type	Characteristics
Heavy snow storm	Produces six or more inches of snow in forty-eight hours or less, as defined in the Illinois Natural Hazard Mitigation Plan.
Blizzard	The following conditions prevail for a period of three hours or longer: sustained wind or frequent gusts to 35 mph or greater and considerable falling and/or blowing snow.
Ice storm	When damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of 1/4" or greater.

Smaller communities in Stephenson County are more likely (than Freeport, for example) to be isolated during these types of events, and snowfall and drifting can result in poor driving conditions and impassible roadways. Additionally, severe winter storms are associated with the following:

- Additional costs and greater resources burden (plowing, extra first responder hours, etc.)
- Damaged and collapsed roofs from ice damming
- Downed power lines from ice, snowfall, and wind
- Compromised utilities and frozen pipes due to low temperatures
- Immobilized vehicles and households
- Impacts to business facilities related to access, closure, or inventory destruction
- Impacts to public and non-profit facilities related to access and closure
- Slick roads, high winds, and decreased visibility, as well as frostbite and hypothermia
- Human and livestock injury and death

[68] "Glossary," NWS, NOAA, last accessed March 30, 2016

In February 2011, a blizzard deposited just under a foot of snow in the Freeport area and across northwest Illinois, forcing temporary roadway closures. Accumulation of snow proved significant during the 2013-2014 winter season. In January 2014, temperatures ranged into the -20s; the entire season was characterized by periods of notable cold and concerns about salt shortages.

Summary of Severe Winter Storms Impacts & Vulnerabilities

- All Cities (Freeport) and All Villages (Cedarville, Dakota, Davis, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, and Winslow): above-ground utilities, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, public safety and public access
- Stephenson County: above-ground utilities, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, crops and livestock, public safety and public access, county transit system

See *Table 3.38: Assets, Vulnerabilities, and Risks by Community*, *Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County*, and *Maps 3.2 - 3.11 for other vulnerabilities.*

HAZARD RANK

Ranking Hazards: Statewide

As part of the planning process for the 2013 Illinois Hazard Mitigation Plan, the Illinois Natural Hazard Mitigation Planning Committee ranked hazards on a scale of low (least severe) to severe (most severe). Hazards in Stephenson County were rated by the statewide planning committee as follows:

Table 3.36: Natural Hazard Severity in Stephenson County, 2013 Illinois Hazard Mitigation Plan

Hazard	Rating	Scale
Severe Thunderstorms	Severe	From least to most severe: • Low (0 to 12 points) • Guarded (13 to 24 points) • Elevated (25 to 36 points) • High (37 to 48 points) • Severe (49 to 60 points).
Severe Winter Storms	High	
Drought	Elevated	
Extreme Temperatures	Elevated	
Flooding	Elevated	
Tornado	Elevated	
Earthquake	Guarded	

Ranking Hazards: Threat and Hazard Identification and Risk Assessment (THIRA)

Using a tool provided by IEMA, SCEMA in November 2015 completed a THIRA. Combined hazards (natural and human/disease-related) in Stephenson County were rated as follows:

Illustration 3.5: Hazard Severity in Stephenson County, 2015 Threat and Hazard Identification and Risk Assessment

Least Severe Hazard									Most Severe Hazard
Drought	School and Workplace Violence	Train Derailment	Cyber Incident	Power Failure	Hazardous Materials Release	Tornado	Winter Storm	Flood	Severe Storm

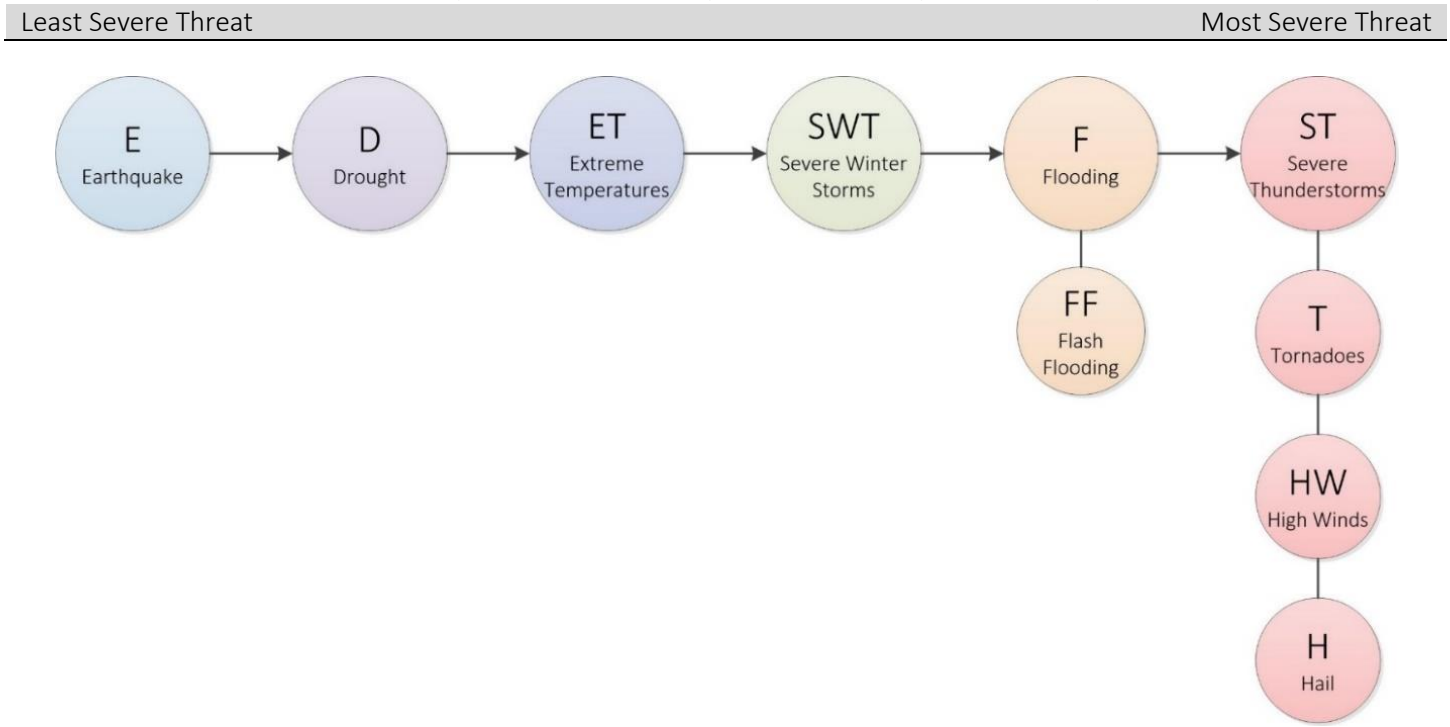
Note: THIRA considers other threats as well (complete list available in FEMA's Threat and Hazard Identification and Risk Assessment Guide).

Ranking Natural Hazards: Local

As part of the Stephenson County planning process, the planning committee re-ranked hazards included in the 2008 plan. The following characteristics were considered: intensity of damage (measured in dollars), location (measured in area affected/spatial extent), speed of onset (measured in length of time), duration (measured in length of time), and frequency (measured in annual probability of occurrence based on historical events).

In the following illustration, each hazard is ranked from least severe (earthquake) to most severe (severe thunderstorms). While ranking severe thunderstorms as the greatest threat to Stephenson County, the committee acknowledged significant concerns about severe flooding and flash flooding. The ranking is the same for each jurisdiction (sans flooding for communities that do not typically experience flooding).

Illustration 3.6: Natural Hazard Severity, 2015 Local Planning Committee – Stephenson County



Ranking Natural Hazards: Method

Lead agencies also established a method for ranking hazards, although the ultimate order was determined at the planning committee's discretion. The related formula accounted for intensity/severity (values range from 1 to 3), probability of hazard occurring (values range from 1 to 3), and priority for locals (values range from 1 to 4). Historical events used to determine probability are listed in Appendix D.

Table 3.37.1: Intensity/Severity

Potential intensity/severity?	What type of damage is caused by the event?
3 - High severity	Deaths/injuries presumed likely Thousands to millions of dollars in damage presumed likely
2 - Moderate severity	Deaths/injuries presumed possible Thousands to millions of dollars in damage presumed likely
1 - Low severity	Deaths/injuries presumed possible Thousands to millions of dollars in damage presumed possible

Table 3.37.2: Probability of Hazard Occurring

Is the event likely to occur?	Based on historical events/local input, how often does the event occur?
3 - High probability	The event is highly likely to occur yearly (50-100% chance of occurring based on historical events/local input, based on 1996-2015 data)
2 - Moderate probability	The event is likely to occur yearly (10-49% chance of occurring based on historical events/local input, based on 1996-2015 data)
1 - Low probability	The event is not likely to occur yearly (Less than 10% chance of occurring based on historical events/local input, based on 1996-2015 data)

Table 3.37.3: Priority for Locals

Given high consideration?	How is priority defined?
4 - Chief consideration	Selected by the planning committee and lead agencies as the chief priority
3 - High consideration	Selected by the planning committee and lead agencies as a higher priority
2 - Moderate consideration	Selected by the planning committee and lead agencies as a moderate priority
1 - Low consideration	Selected by the planning committee and lead agencies as a lower priority

Note: considers other hazard characteristics, planning committee/public concern, and local ability to dedicate resources to projects/programs, Illinois' plan, the THIRA, public survey, and other considerations.

Table 3.37.4: Hazard Formula

Hazard	Extent	Probability	Local Priority	Index	Rank
 Drought	1	2	2	4	5
 Earthquake	3	1	1	3	6 - Least
 Extreme Temperatures	2	2	2	8	3
 Flooding (& related)	2	3	3	18	2
 Severe Thunderstorms (& related)	3	3	4	36	1 - Greatest
 Severe Winter Storms	2	3	2	12	3

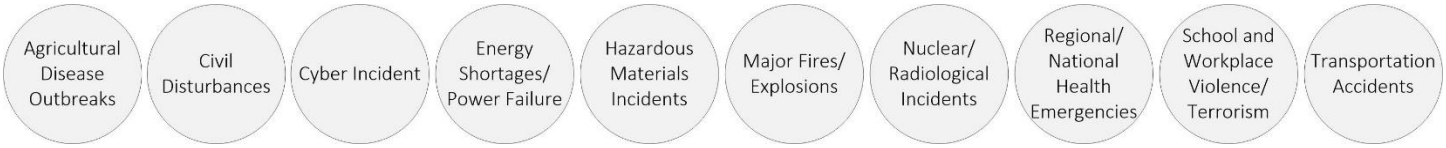
*Note: Index = Extent * Probability * Local Priority*

Human/Disease-Related & Other Hazards: Local

In addition to natural hazards, the Stephenson County Multi-Hazard Mitigation Planning Committee revisited human/disease-related and other hazards described in the 2008 plan. Although ranked during the planning process for discussion purposes, hazards noted here are alphabetized and in no particular order of severity.

Illustration 3.7: Other Hazards, 2015 Local Planning Committee – Stephenson County

Alphabetical Order



As noted earlier in the document, committee members included cyber incident for the first time. In general, possible threats and concerns related to hazards include:

- *Agricultural disease outbreaks:*
  - Mass livestock culls prompted by widespread cattle or swine-based illness
- *Civil disturbances:*
  - Violent protests and unlawful assemblies
- *Cyber incident:*
  - Theft of constituent/customer information from private and public databases
  - Botnet deployments made possible by unprotected or poorly protected private sector and government computer networks
  - CryptoLocker, phishing, and other attacks made possible by user carelessness, exploitation, ignorance, overly complicated GUIs/programming, etc.
  - Malware impacting the performance of equipment, facilities, and interconnected systems
- *Energy shortage/power failure:*
  - Disruptions caused by aging utilities, above and below ground
- *Major fires/explosions:*
  - Fuel production facilities
  - Abandoned or condemned housing; illegally sourced electricity or natural gas
  - Meth production
- *Hazardous materials:*
  - Crude oil shipments
  - Poor communication between private railways and public institutions
- *Nuclear/radiological incidents:*
  - Impacts related to the evacuation of people in adjacent or neighboring counties with nuclear power plants
- *Regional/national health emergencies*:
  - Diseases that require quarantine, such as Ebola, etc.
  - Diseases that impact particular populations more severely than others
  - Disruptions to water supply and contaminated water
- *School and workplace violence/terrorism*:
  - Mass casualty events, especially mass shootings
- *Transportation:*
  - See hazardous materials above

ASSETS, VULNERABILITIES, & RISKS INVENTORY

Information about community assets was collected from local stakeholders. If information was unavailable or the asset or vulnerability did not apply, n/a (not available or not applicable) is indicated in the respective column/row.

Table 3.38: Assets, Vulnerabilities, and Risks by Community

Asset, Vulnerability, or Risk	Stephenson County	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
Critical Facility in Floodplain	Y	N	N	N	Y	N	N	Y	Y	N	N	Y
Designated Cooling/Heating Center	N	N	N	N	N	N	N	N	N	N	N	N
Designated Place of Refugee	N	N	N	N	N	N	N	N	N	N	N	N
Designated Storm Shelter	N	N	N	N	N	N	N	N	N	N	N	N
Fixed Water Tower Generator*	n/a	Y	N	Y	N	N	Y	N	Y	n/a	N	Y
Fixed Wastewater Treatment Plant Generator*	n/a	N	N	N	Y	N	Y	Y	Y	n/a	N	Y
Lightning Detection System	n/a	N	N	N	N	N	N	N	N	N	N	N
Outdoor Warning Sirens	N	Fire	Fire	Y	Y	N	Fire	Fire	Y	Y	Fire	Fire
Combined Sanitary and Storm Sewer	n/a	N	N	N	N	N	N	N	n/a	N	N	N
Manufactured Home Community	Y	N	N	N	Y	N	N	N	N	N	N	N
Federal Facility	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
State Facility	Y	N	N	N	Y	N	N	N	N	N	N	N
EMS Facility	n/a	N	N	N	Y	Y	Y	N	Y	N	Y	N
Fire Department Facility	n/a	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Police Department Facility	Sheriff	Combined	N	Combined	Y	Combined	Y	N	n/a	N	N	N
Health Clinic	n/a	N	N	Y	Y	N	Y	Y	N	N	N	N
Hospital	n/a	N	N	N	Y	N	N	N	N	N	N	N
Local Newspaper	n/a	N	Y	N	Y	N	Y	Y	N	N	N	N
Local Radio	n/a	N	N	N	Y	N	N	N	N	N	N	N
Railheads/Railyards/Rail Spurs	Y	N	N	N	Y	N	Y	N	N	N	N	N
Park/Recreation Site	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Civic/Cultural Center	Y	Y	Lions and Fire.	Y	Y	N	Y	Y	Y	N	N	Y
Museum	n/a	Y	N	N	Y	Y	Y	N	n/a	N	Y	Y
Multi-Family Housing (four units or more)	n/a	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y
Assisted Living/Nursing Facility	County	N	N	N	Y	N	Y	N	N	N	N	N
Financial Institution	n/a	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Energy or Fuel Production	n/a	N	N	N	Y	N	Y	N	N	N	N	N

*Note: * = mobile or portable generators not considered.*

Some facilities in Stephenson County are located in the floodway/floodplain. Those facilities reported by local officials and residents are listed as follows:

Table 3.39: Community Assets in Floodway/Floodplain – Stephenson County

Asset	Jurisdiction	Estimated Replacement Cost
Health Department	Stephenson County	$1 - 3 million
Highway Department (roadway)		$100 - 150k (roadway improvements)
Nursing Home (roadway)		$100 - 150k (roadway improvements)
n/a	Village of Cedarville	n/a
n/a	Village of Dakota	n/a
n/a	Village of Davis	n/a
Taylor Park School	City of Freeport	$10 - 15 million
Fire Department Training Facility		$1 - 2 million
Lift Station*	Village of German Valley	$100k - 500k
n/a	Village of Lena	n/a
Fire Department Training Facility	Village of Orangeville	$500k - 1 million
Pearl City CUSD 200 Bus Garage	Village of Pearl City	$100k - 500k
Lift Station (x2)		$100k - 500k
Well		$500k - 1 million
n/a	Village of Ridott	n/a
n/a	Village of Rock City	n/a
Fire Station	Village of Winslow	$500k - 1 million
Museum		$500k

*Note: estimated replacement costs were provided by local experts or gathered from news articles reporting on similar capital improvement/infrastructure projects elsewhere. Most wastewater treatment plants are located in or adjacent to FEMA floodway/floodplain. However, many have been elevated or otherwise protected from infiltration. Estimated replacement costs of wastewater treatment plants range from $10 million (smallest) to $50 million (largest), depending on new features and alternative energy approaches preferred. Parks and open spaces in floodplain/floodway are not listed. * = Not in floodway/floodplain but susceptible under certain circumstances.*

Ideally, future planning processes would attempt to identify the replacement value of most civic and government structures, as well as public infrastructure.

In addition to community assets, there are five manufactured/mobile home communities in or near Stephenson County:

- Knollwood Estates
- Timber Ridge
- West Town
- Woodridge Estates
- W Stephenson St Rd and N/S Rink Rd

IMPACTS, VULNERABILITIES, & RISK ASSESSMENT MAPS BY JURISDICTION

Communities were consulted and public sources of information/governmental datasets were used to develop the following maps. Key features illustrated include FEMA flood zones and critical facilities (such as police and fire stations, wastewater treatment plants, water towers, etc.).

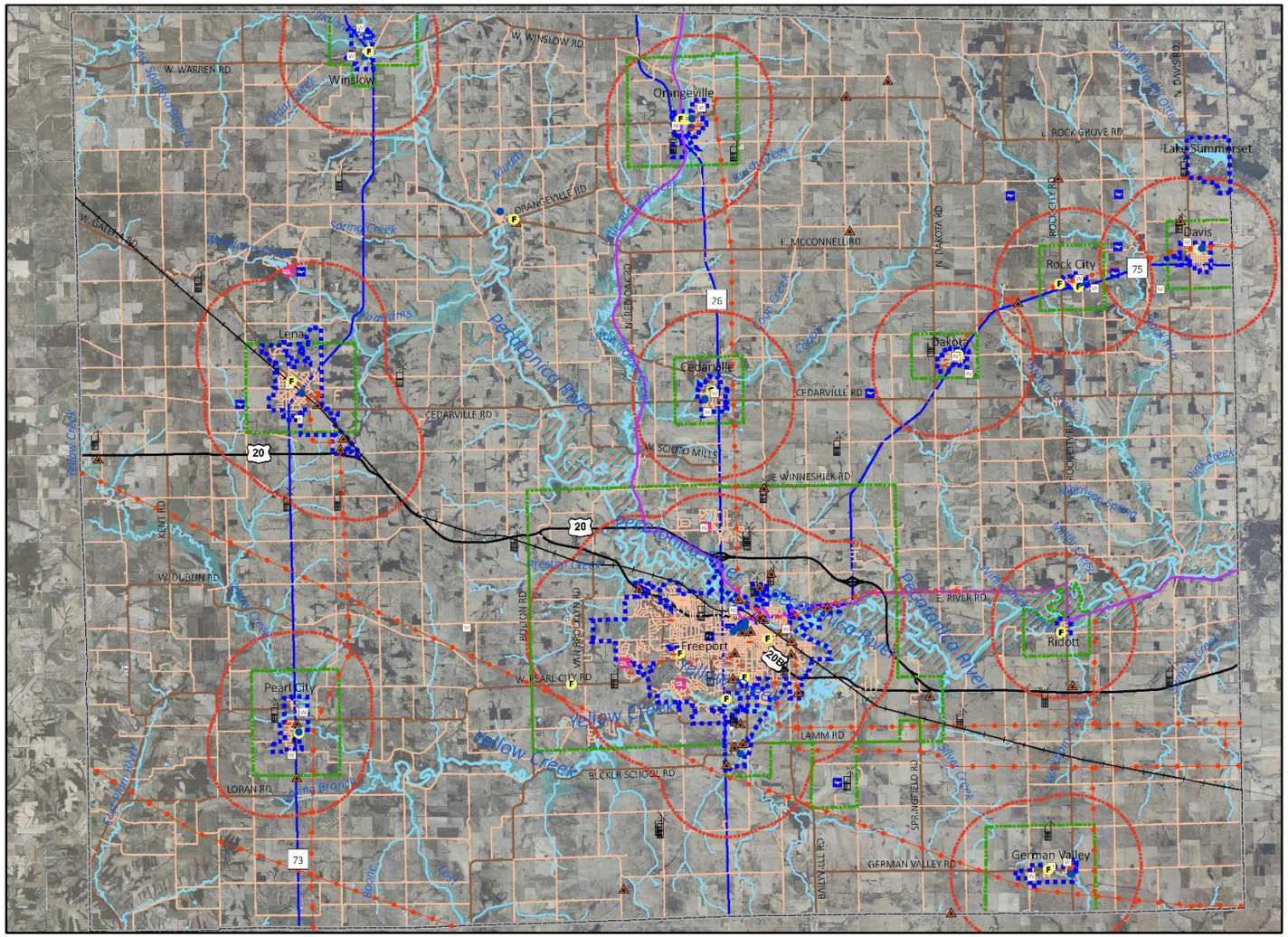
Maps Included*

Map 3.2: Countywide Area
Map 3.3: Cedarville
Map 3.4: Dakota and Rock City Area
Map 3.5.1: Freeport Area
Map 3.5.2: South Freeport Area
Map 3.5.3: Northeast Freeport Area
Map 3.6: German Valley and Ridott Area
Map 3.7: Lena Area
Map 3.8: McConnell and Buena Vista Area
Map 3.9: Orangeville and Red Oak Area
Map 3.10: Pearl City Area
Map 3.11: Winslow Area

**Maps like these and others contained within are available enlarged in a supplemental document*

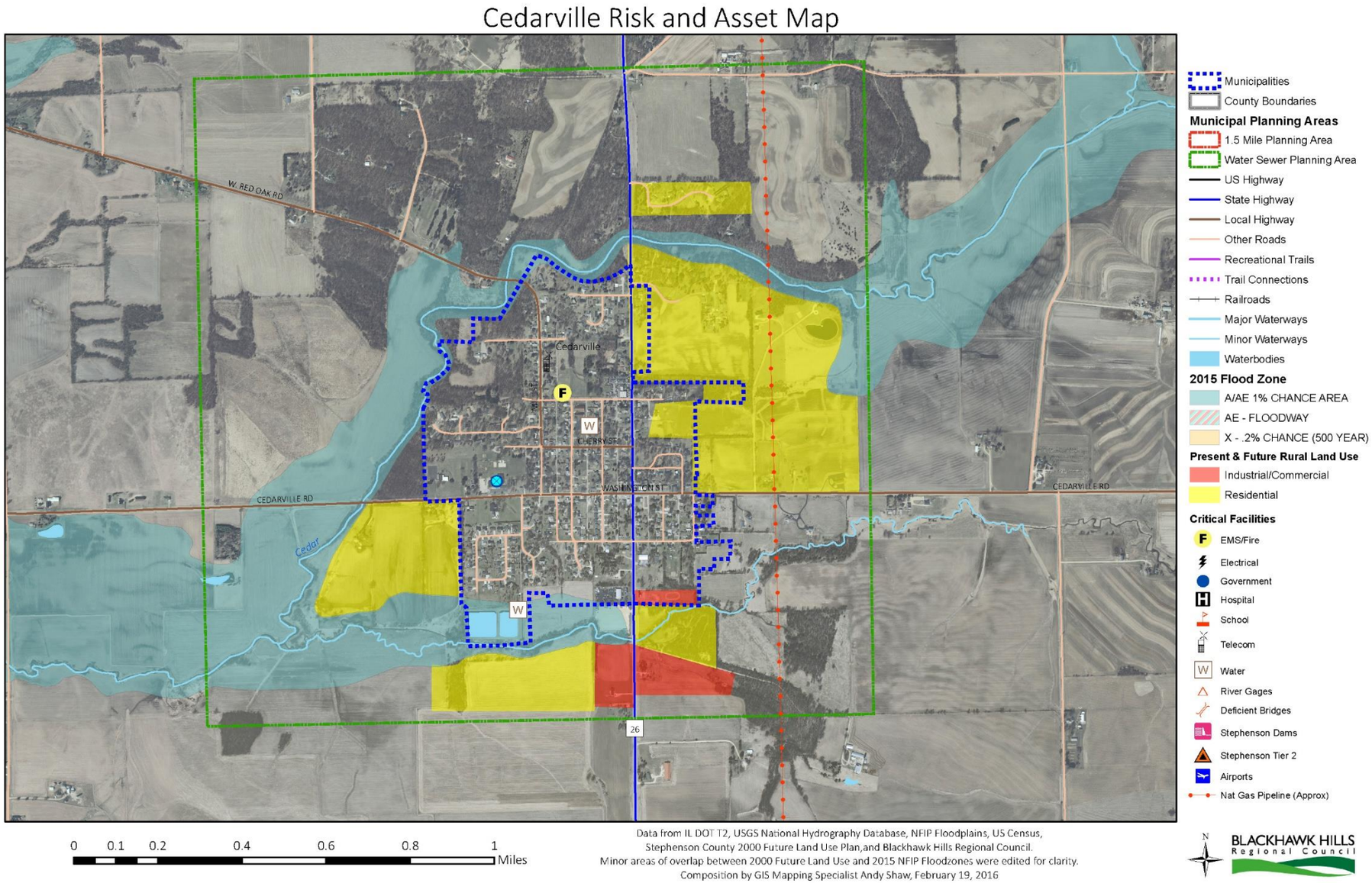
Map 3.2: Countywide Area

Stephenson County Risk and Asset Map

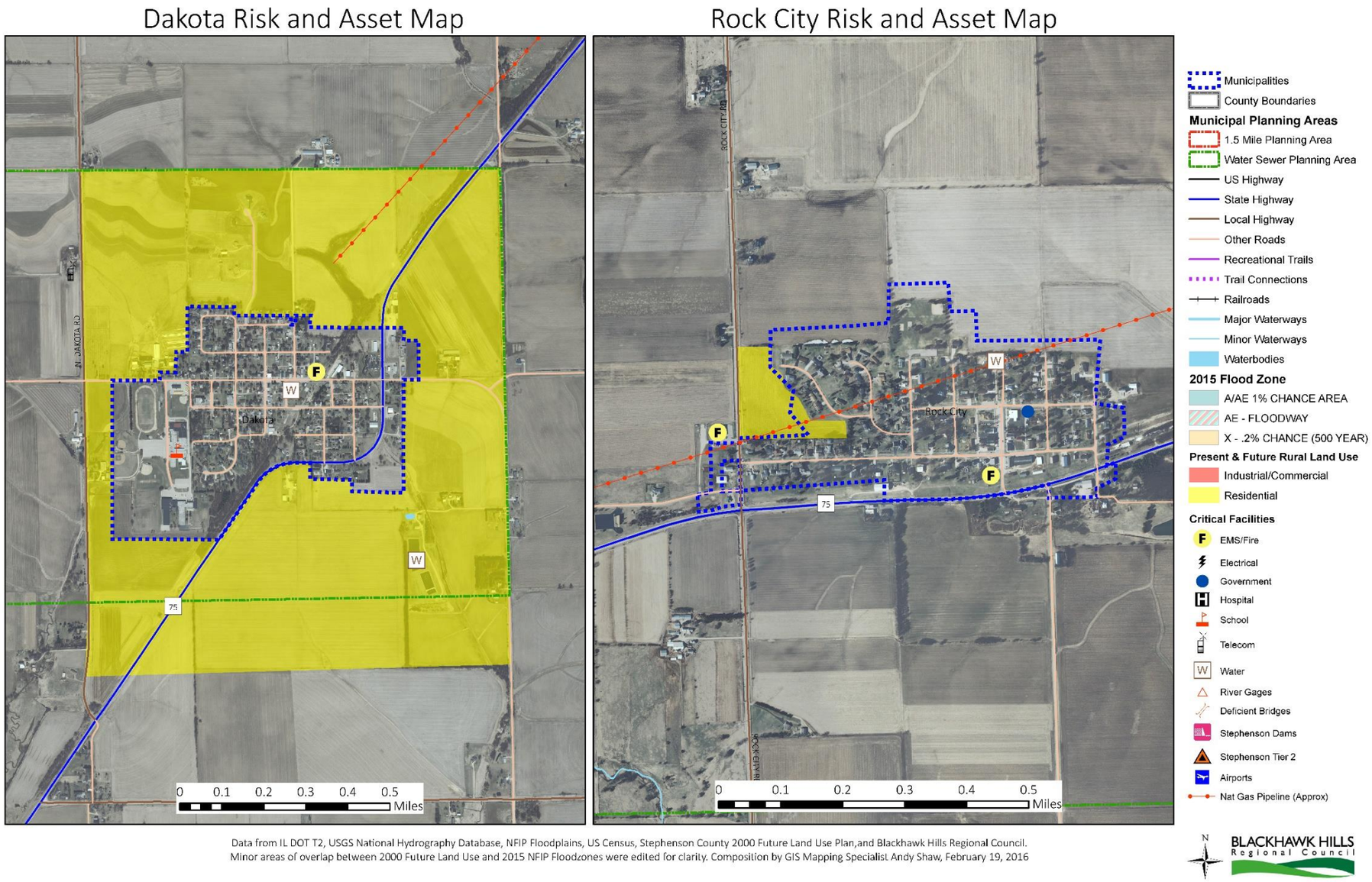


Data from IL DOT T2, USGS National Hydrography Database, NFIP Floodplains, US Census,
Stephenson County 2000 Future Land Use Plan,and Blackhawk Hills Regional Council.
Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity.
Composition by GIS Mapping Specialist Andy Shaw, February 19, 2016

Map 3.3: Cedarville Area



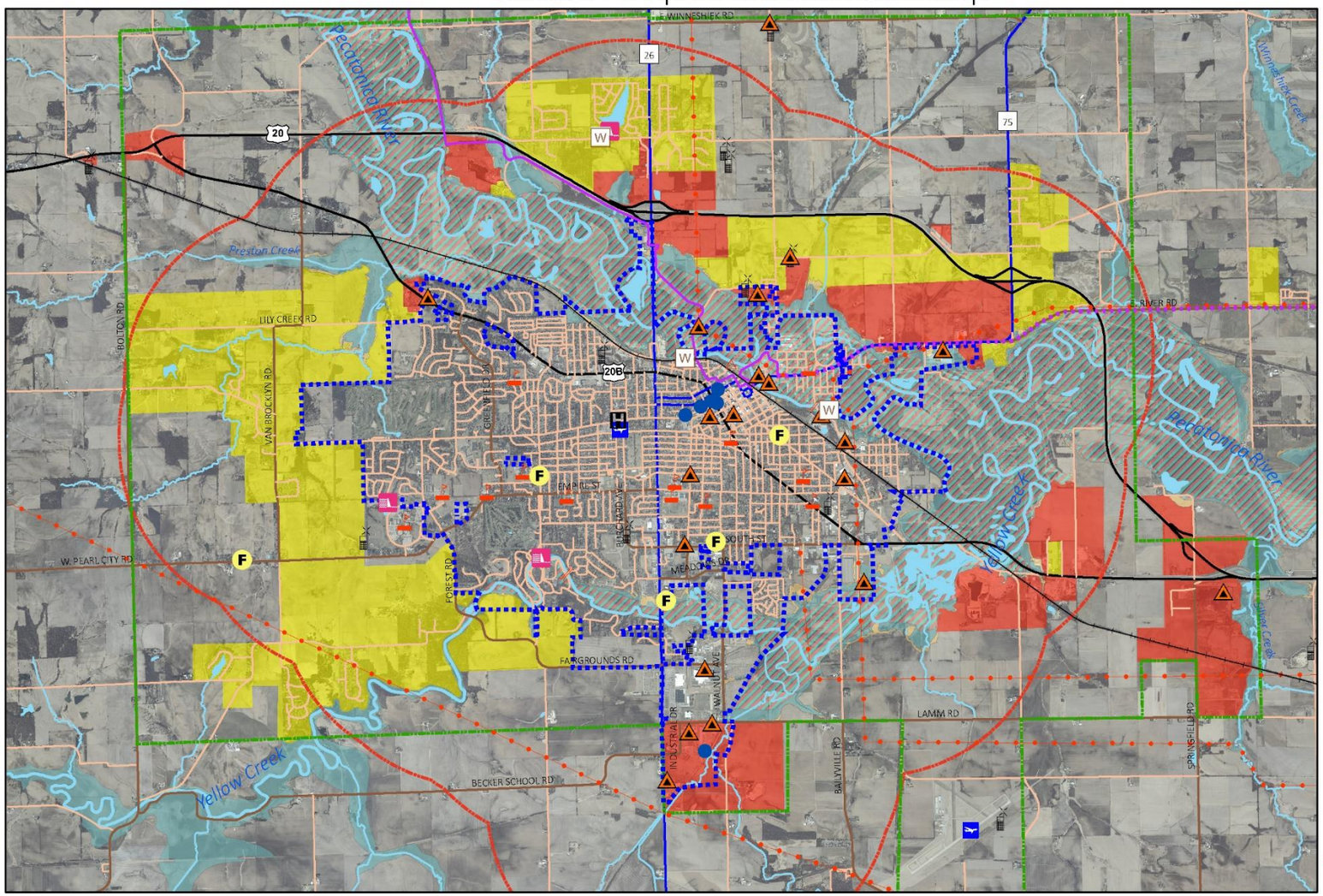
Map 3.4: Dakota and Rock City Area



Data from IL DOT T2, USGS National Hydrography Database, NFIP Floodplains, US Census, Stephenson County 2000 Future Land Use Plan,and Blackhawk Hills Regional Council.
Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity. Composition by GIS Mapping Specialist Andy Shaw, February 19, 2016

Map 3.5.1: Freeport Area

Greater Freeport Risk and Asset Map



- Municipalities
- County Boundaries

Municipal Planning Areas

- 1.5 Mile Planning Area
- Water Sewer Planning Area
- US Highway
- State Highway
- Local Highway
- Other Roads
- Recreational Trails
- Trail Connections
- Railroads
- Major Waterways
- Minor Waterways
- Waterbodies

2015 Flood Zone

- A/AE 1% CHANCE AREA
- AE - FLOODWAY
- X - .2% CHANCE (500 YEAR)

Present & Future Rural Land Use

- Industrial/Commercial
- Residential

Critical Facilities

- EMS/Fire
- Electrical
- Government
- Hospital
- School
- Telecom
- Water
- River Gages
- Deficient Bridges
- Stephenson Dams
- Stephenson Tier 2
- Airports
- Nat Gas Pipeline (Approx)

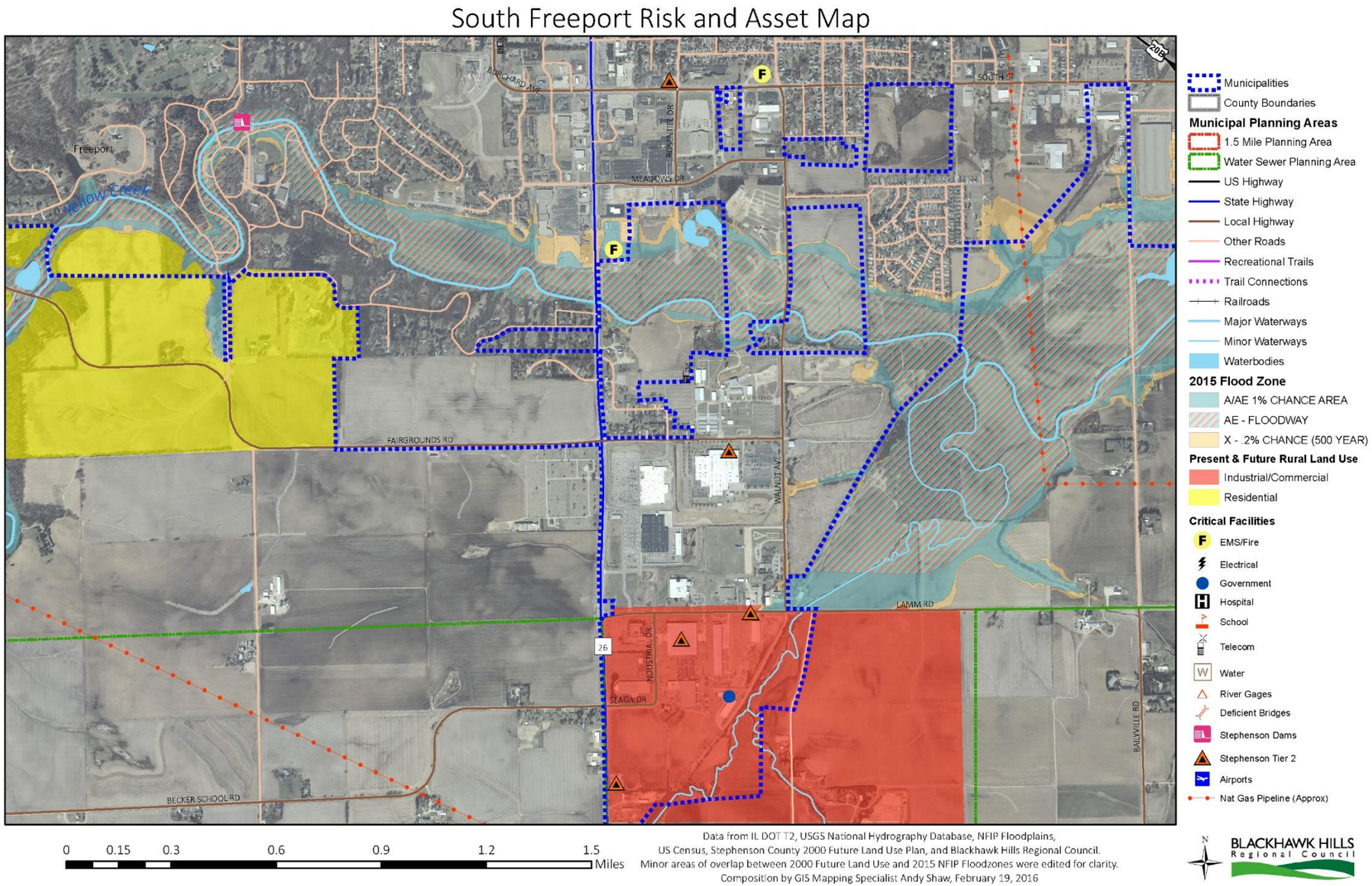
0 .5 1 2 3 4 Miles

Data from IL DOT T2, USGS National Hydrography Database, NFIP Floodplains,
US Census, Stephenson County 2000 Future Land Use Plan, and Blackhawk Hills Regional Council.
Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity.
Composition by GIS Mapping Specialist Andy Shaw, December 1, 2015

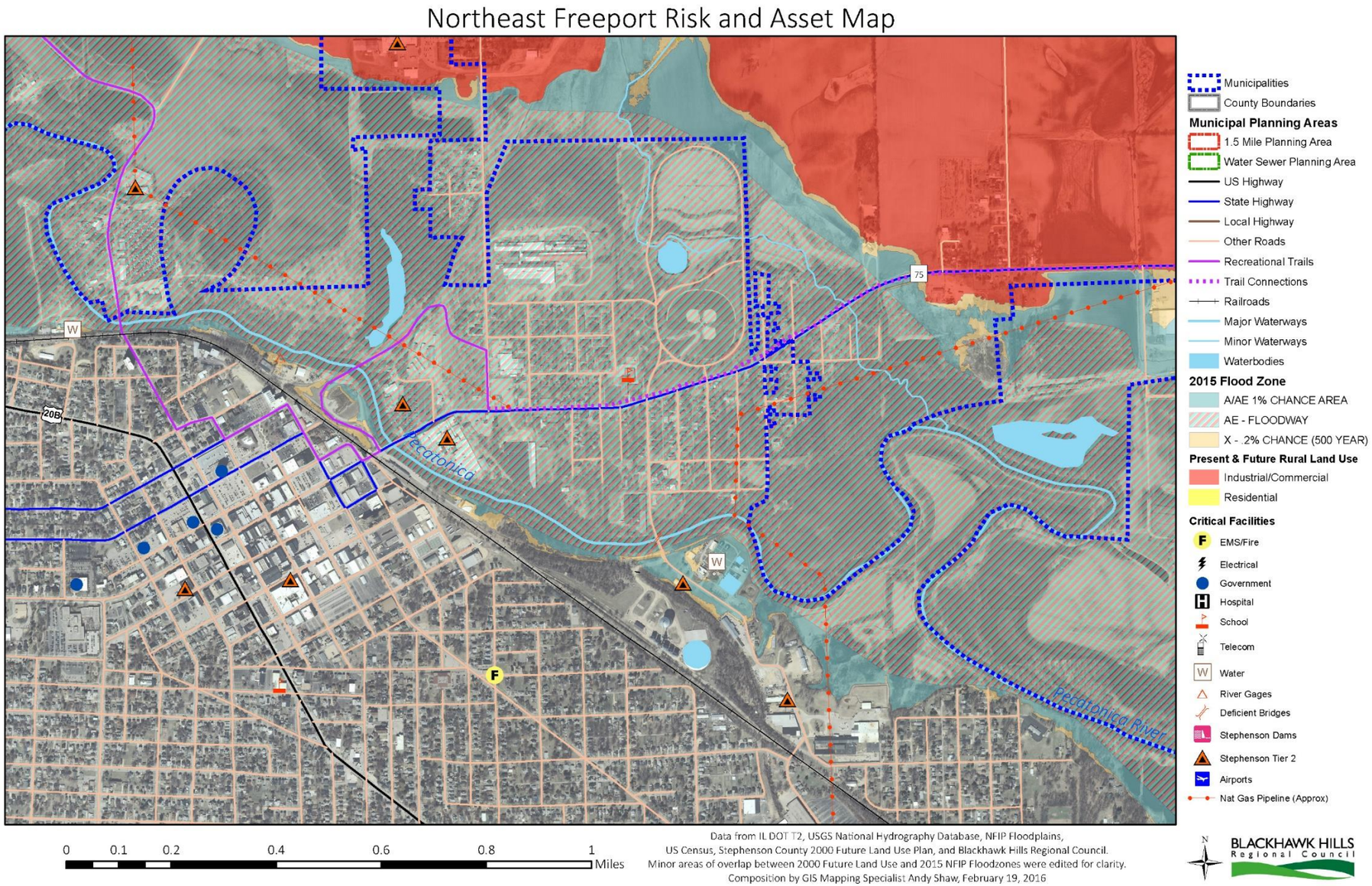
N

BLACKHAWK HILLS Regional Council

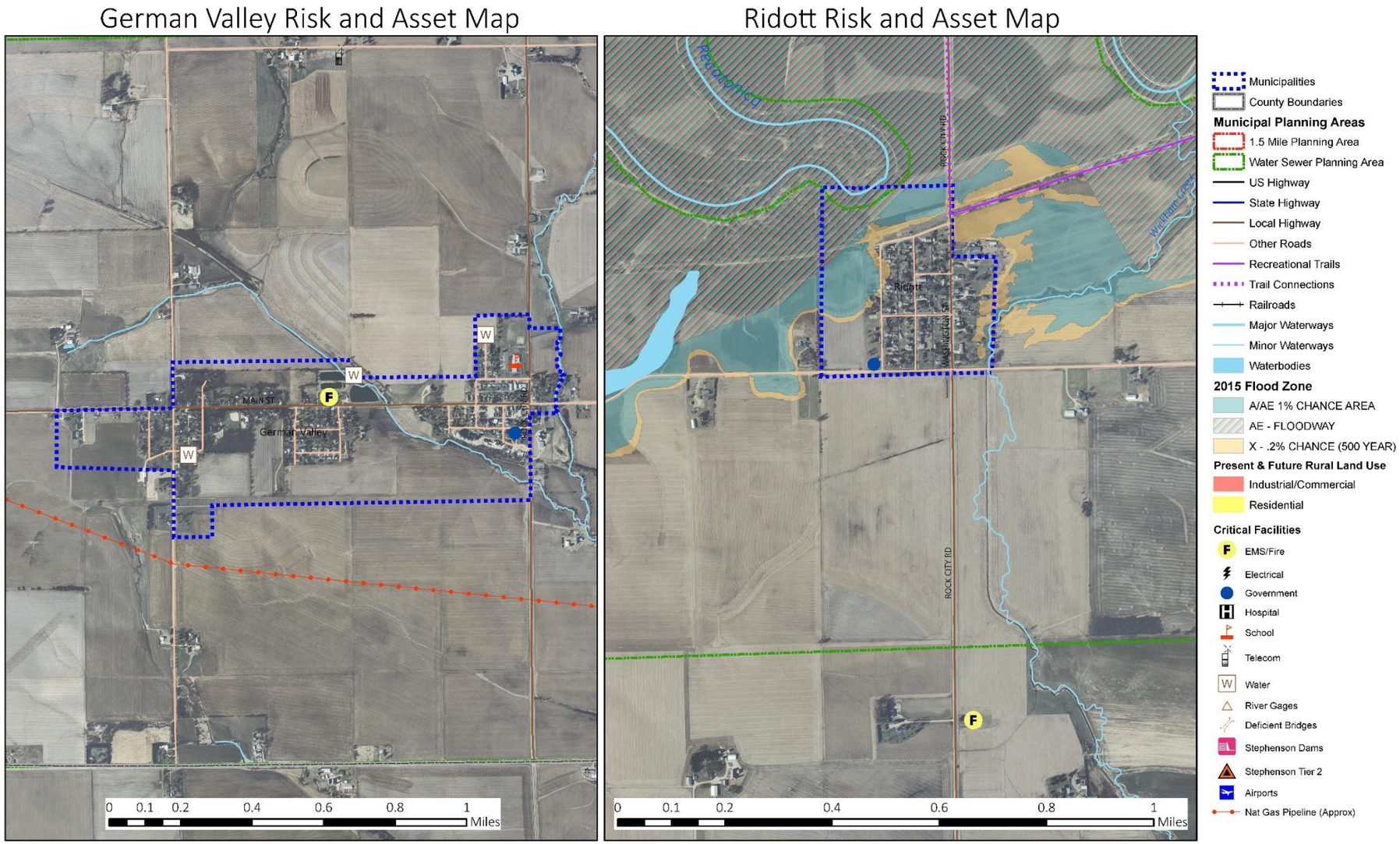
Map 3.5.2: South Freeport Area



Map 3.5.3: Northeast Freeport Area

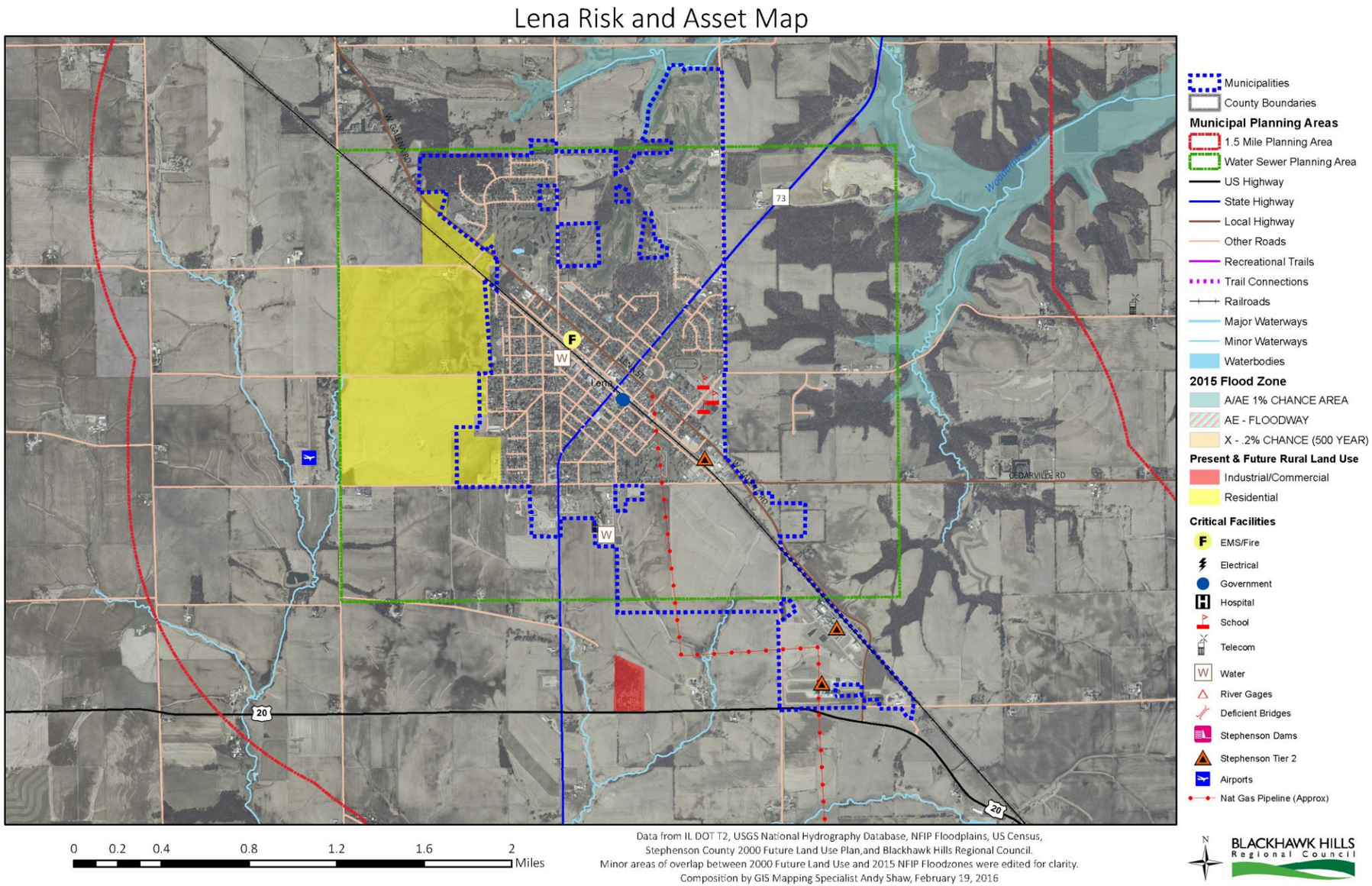


Map 3.6: German Valley and Ridott Area

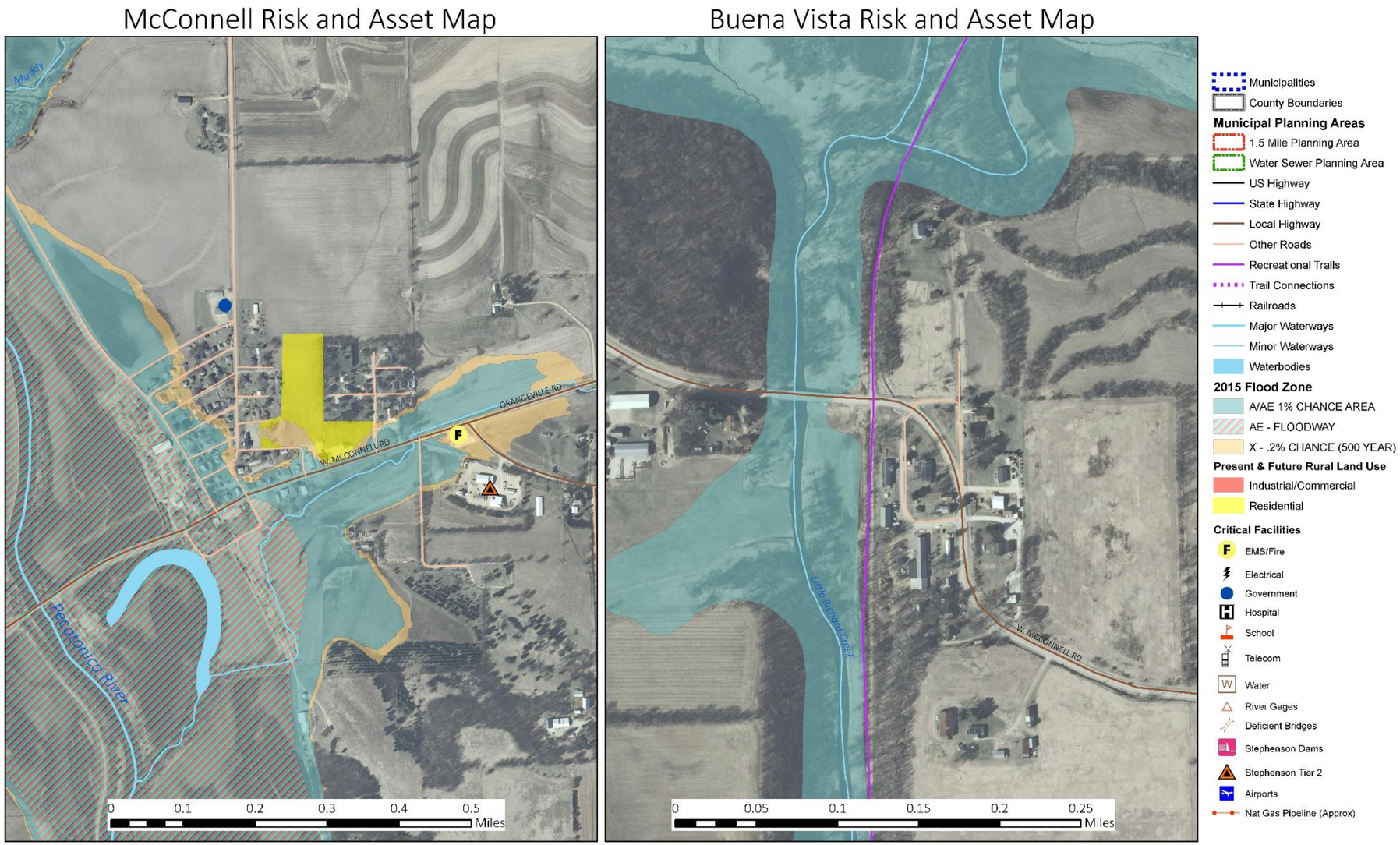


Data from IL DOT T2, USGS National Hydrography Database, NFIP Floodplains, US Census, Stephenson County 2000 Future Land Use Plan,and Blackhawk Hills Regional Council. Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity. Composition by GIS Mapping Specialist Andy Shaw, February 19, 2016

Map 3.7: Lena Area

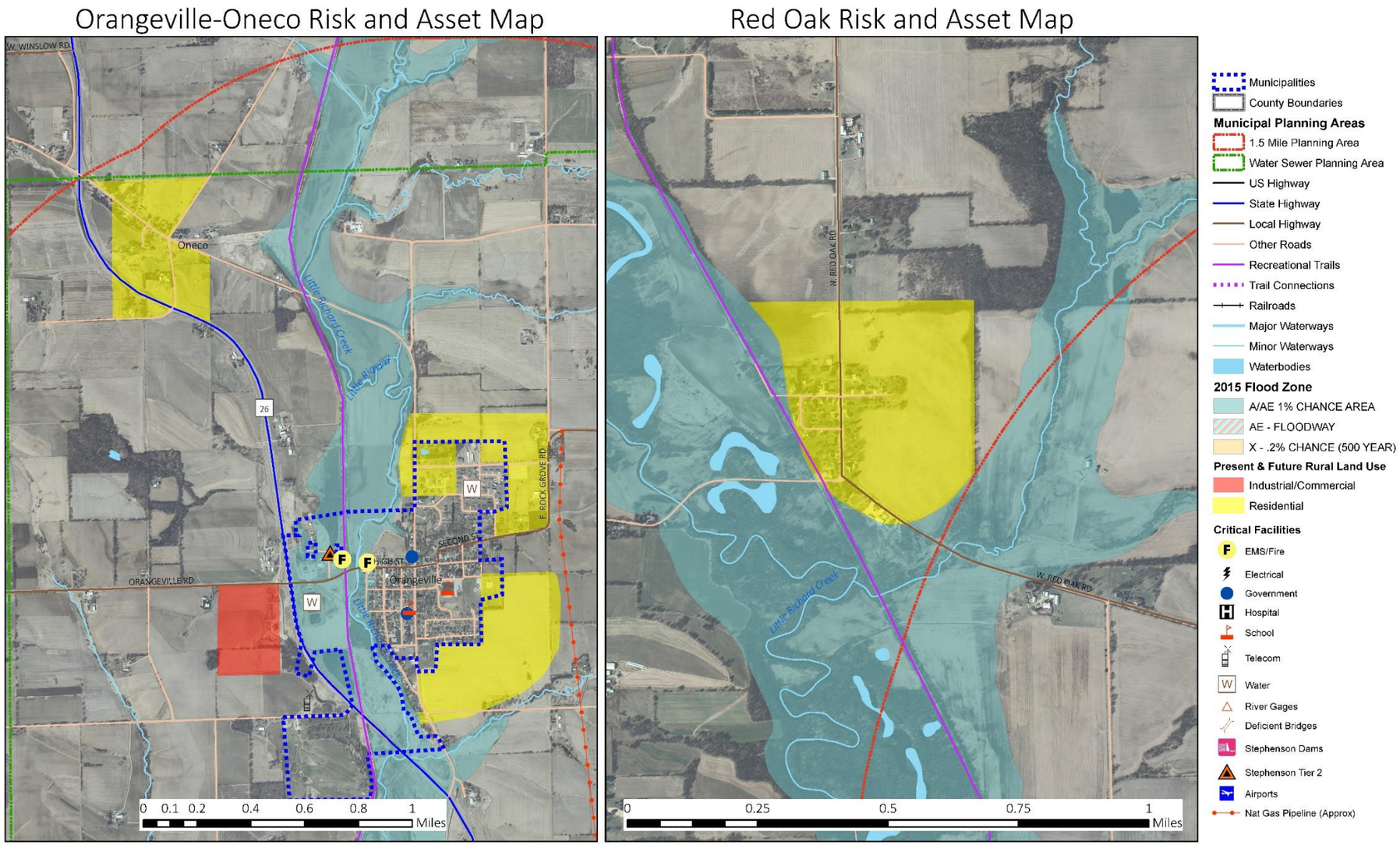


Map 3.8: McConnell and Buena Vista Area



Data from IL DOT T2, USGS National Hydrography Database, NFIP Floodplains, US Census, Stephenson County 2000 Future Land Use Plan,and Blackhawk Hills Regional Council.
Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity. Composition by GIS Mapping Specialist Andy Shaw, February 19, 2016

Map 3.9: Orangeville and Red Oak Area



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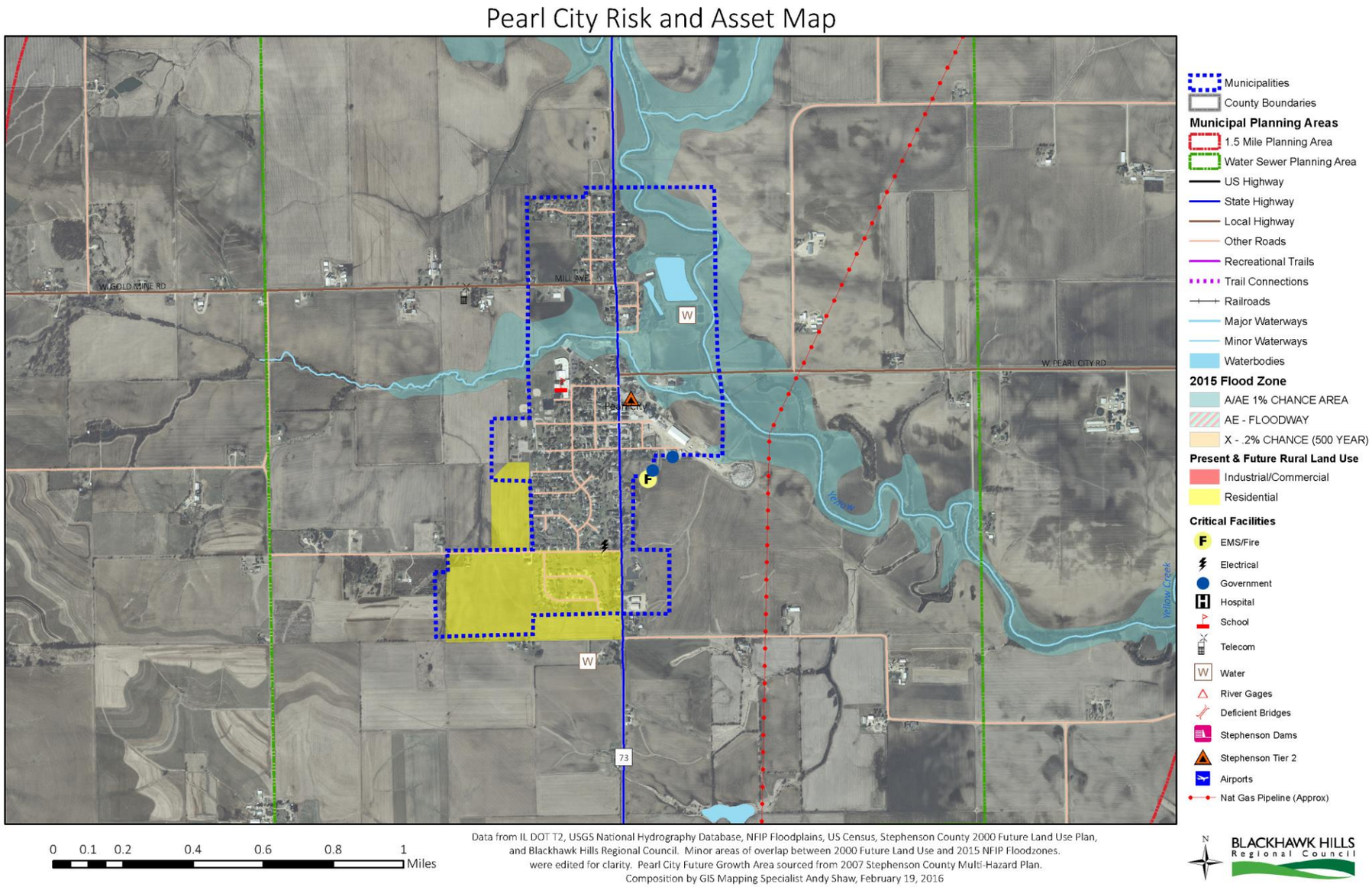
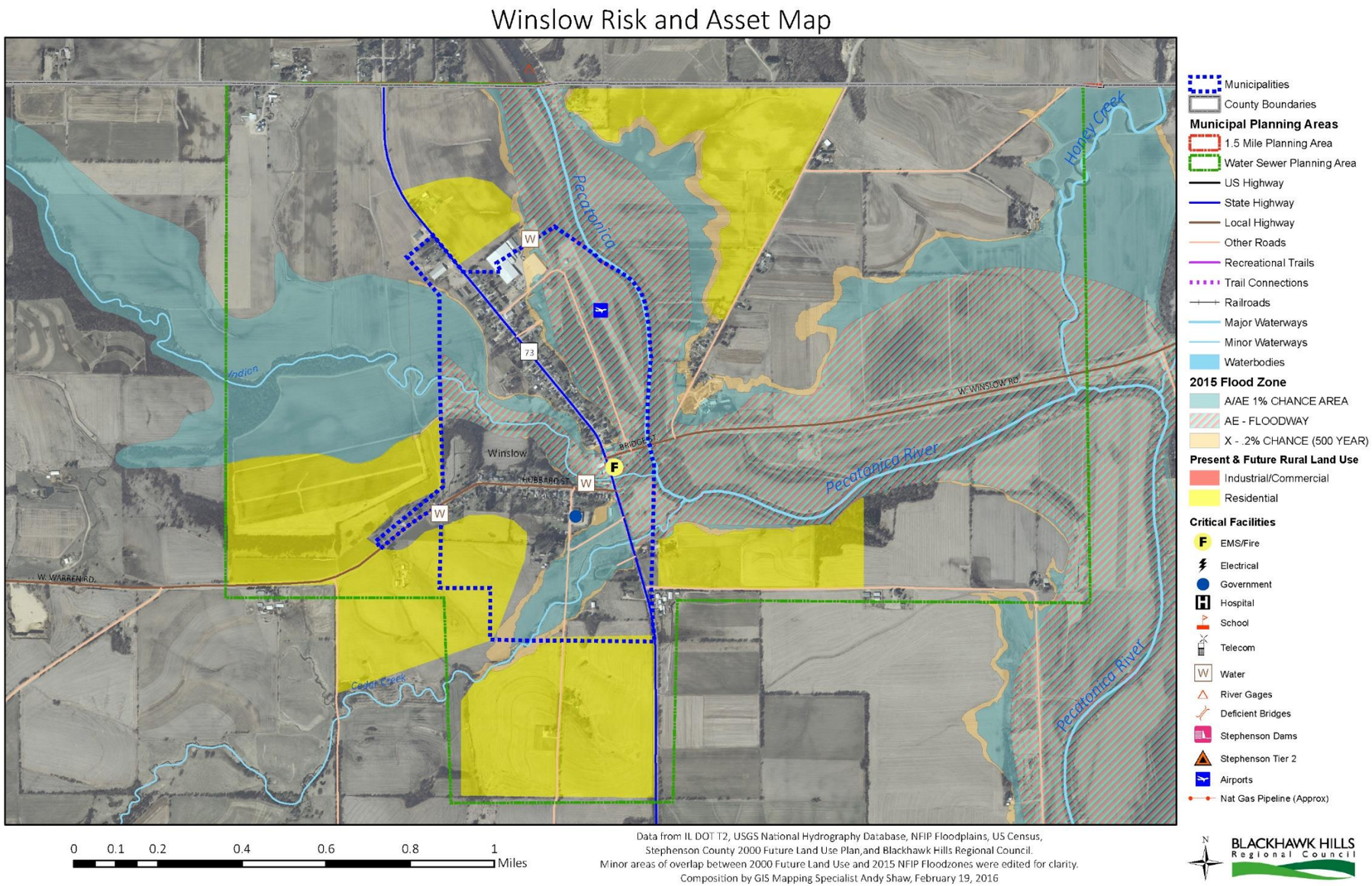
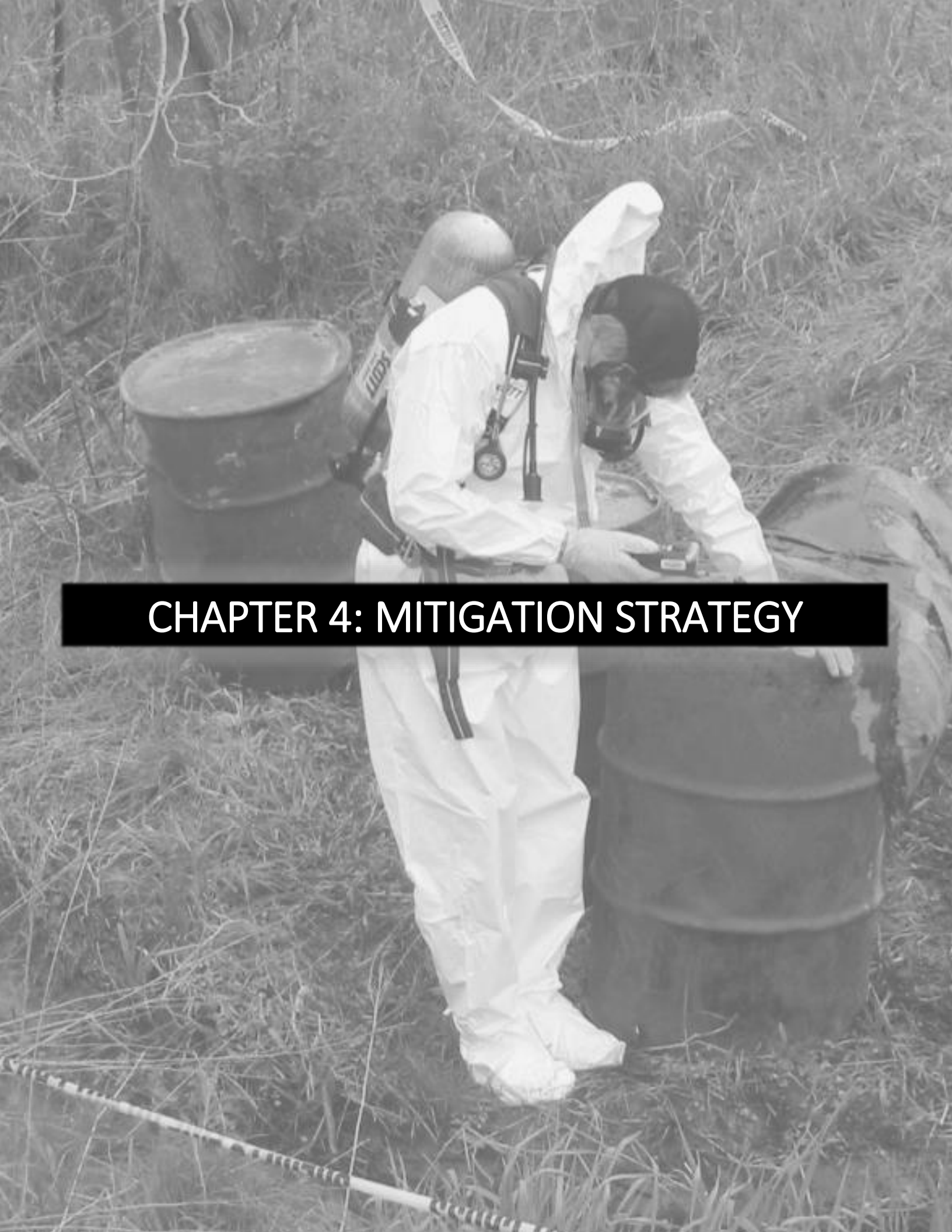
Minor areas of overlap between 2000 Future Land Use and 2015 NFIP Floodzones were edited for clarity. Composition by GIS Mapping Specialist Andy Shaw, February 19, 2016

Map 3.10: Pearl City Area



Map 3.11: Winslow Area





CHAPTER 4: MITIGATION STRATEGY

CHAPTER 4: MITIGATION STRATEGY

OVERVIEW

In this chapter, the goals, objectives, and actions of the mitigation strategy are addressed. Goals for the next five years remain similar to 2008, although some have been combined or simplified. Corresponding objectives now follow. Progress with respect to general implementation and previous actions taken is noted. This chapter also expands on priorities included in 2008 and covers a comprehensive range of actionable projects and programs (including numerous actions related to the built environment) considered by the planning committee, stakeholders, and the public.

As concerns an action plan, projects and programs are listed and prioritized for each community (using a simple approach of listing benefits and costs, as well as consideration for vulnerability before and after). Implementation is further addressed in Chapter 5.

For reference, the graphic to the right, available at mitigationguide.org, visualizes the relationship between goals, actions, and the action plan.

Accomplishments

The following actions – those completed, near completion, or ongoing since the 2008 hazard mitigation plan – were identified:

Table 4.1: Completed/Ongoing Actions from 2008 Plan – Stephenson County

#	Action	Summary
1	Pursue community outreach and education	• NFIP community education programming • Public outreach connected to technical assistance from US EPA Superfund Redevelopment Program • Cooperation with the Illinois State Water Survey (ISWS) to fund flood inundation mapping for Freeport's East Side
2	Update flood maps	• ISWS re-surveyed the Pecatonica River throughout Stephenson County and along Yellow Creek, including from Forest Rd in Freeport to the county's eastern border • FEMA published new flood maps in 2015 with several jurisdictions updating their floodplain ordinances
3	Enhance stormwater management and erosion control	• University of Wisconsin-Madison Department of Urban and Regional Planning developed guidelines for landscaping and stormwater management • Freeport was awarded an US EPA Brownfields Area Wide Planning Grant. The grant funds a technical study of green and gray infrastructure in the city's East Side floodway, which will be used to identify flood mitigation strategies based on green infrastructure approaches
4	Maintain river streamgages	• Ongoing maintenance
5	Protect water quality	• $600,000 brownfields clean-up grant to address soil and groundwater contamination on Freeport's East Side
6	Promote and improve cooling center use	• Space dedicated by Freeport Housing Authority
7	Promote home weatherization	• Northwest Illinois Community Action Agency (NICAA) searches for weatherization funding and administers weatherization programs geared towards households of limited means • NICAA and Freeport participate in Illinois Housing Development Authority programs that provide weatherization/energy efficiency upgrades, including windows, HVAC systems, and other property improvements to homeowners of limited means
8	Pursue property acquisition and demolition	• Orangeville completed the acquisition and demolition of several structures historically impacted by flooding
9	Create website and Facebook site	• SCEMA launched a standalone website (stcoema.org) and Facebook page (facebook.com/stcoema)
10	Continue NFIP participation	• Communities most likely to be impacted by flooding are enrolled in the NFIP
11	Address Currier Creek flooding	• Installation of berms to divert water during minor flooding events completed
12	Complete commodity flow studies	• Two studies conducted: one for truck freight and one for rail freight

GOALS & OBJECTIVES

To begin, the committee reviewed goals from the 2008 plan. Committee members, with support from lead agencies and feedback from community meetings and the public, amended, consolidated, and developed the following goals and objectives:

Table 4.2: Goals & Objectives – Stephenson County

1	Protect life*
1.1	Support public health systems
1.2	Support public safety systems
1.3	Implement modern hazard warning systems
1.4	Plan for vulnerable/special needs populations
1.5	Enact projects, programs, and policies that consider present and future generations
1.6	Consider individual and community needs before, during, and after disasters
2	Protect critical facilities, infrastructure, and environmental health
2.1	Harden civic, government, and private facilities
2.2	Protect water quality
2.3	Preserve open spaces, wetlands, and other natural resources
2.4	Protect historic and cultural assets and information
3	Improve planning and regulatory practices
3.1	Encourage best practices in residential, commercial, and industrial development
3.2	Ensure that building codes and zoning ordinances discourage flood zone development
3.3	Enforce codes, zoning ordinances, subdivision ordinances, and other planning/regulatory policies or laws
3.4	Help communities land-locked by floodway/floodplain find alternative means of development
3.5	Interconnect hazard mitigation, comprehensive, and other community studies, plans, and processes
3.6	Include mitigation strategies in official documents and maps
4	Promote individual and community resiliency
4.1	Help individuals support themselves in times of disaster
4.2	Help communities support themselves in times of disaster
5	Encourage communication and develop relationships
5.1	Develop awareness and education programs
5.2	Pursue regular community outreach
5.3	Improve communication/coordination: first responders, relief agencies, and support organizations
5.4	Improve communication/coordination between municipalities
5.5	Improve communication/coordination between SCEMA and municipalities (and vice-versa)

*Notes: * = Chief goal and objectives.*

ACTIONS & ACTION PLAN

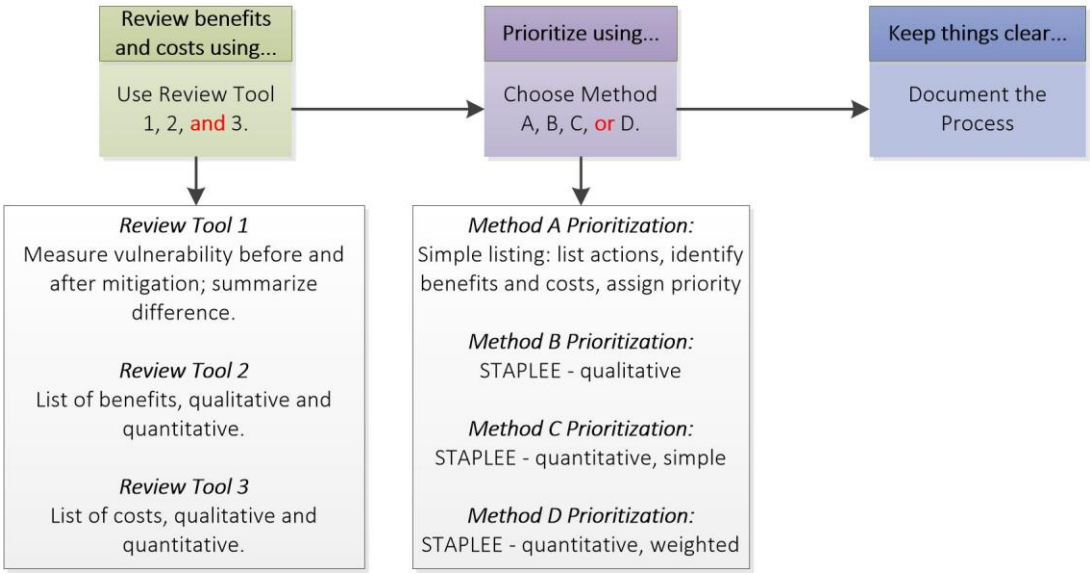
Achieving plan goals requires taking action by way of specific projects and programs. Post-planning efforts should be focused on executing individual actions and measuring progress related to implementation within municipalities and across unincorporated areas. Individuals or organizations responsible for plan maintenance should, over time, modify and remove actions that no longer make sense to the community in question.

To ensure that projects and programs are adequately implemented over the long-term, local officials may need to further define and/or explain actions. Certain actions may need to be supported by resolutions, policies, memorandums of understanding, ordinances, as well as expertise and resources in general. It should be noted that even if actions do not require legal approval from a board or commission, they may still require informal arrangements or organizing in support of implementation.

Prioritization

FEMA's "Using Benefit-Cost Review in Mitigation Planning" explains that the planning committee "needs to select the most cost-effective actions for implementation first, not only to use resources efficiently, but to make a realistic start toward mitigating risks."[69] For the 2016 plan update, the planning committee pursued a simple approach to both the benefit-cost review/analysis and prioritization process (opting for Method A with respect to the latter).

Illustration 4.1: Approaches to Benefit-Cost Analysis and Prioritization



Projects and programs were collected from multiple sources, including the 2008 hazard mitigation plan, lead agencies, planning committee members, community stakeholders, and members of the public. Actions were prioritized using input from the planning committee, community stakeholders, and the public. In particular, meetings three and four of the planning committee were used to assess vulnerability, benefits, and costs, as well as what projects and programs/actions should receive high, medium, or low prioritization (or be dropped from consideration entirely).

[69] "How-To Guide (FEMA 386-5): Using Benefit-Cost Review in Mitigation Planning," FEMA, published May 2007

While not formally applying it, members of the planning committee and the public considered STAPLEE criteria[70] when selecting projects, including:

- Social (community acceptance, effect on segment of population)
- Technical (technical feasibility, long-term solution, secondary impacts)
- Administrative (staffing, funding allocated, maintenance/operations)
- Political (political support, public support, local champion)
- Legal (local authority, potential legal challenge)
- Economic (benefits of action, costs of action, contributes to goals, outside funding required)
- Environmental (effect on air/water/land, endangered species, HAZMAT/waste sites, consistent with comprehensive plan, consistent with state/federal laws)

The results of data collection, discussions, and planning committee/public review are contained within the following tables. As an introduction, this next table of abbreviations and symbols is provided to help the reader understand the information presented.

Table 4.3: Abbreviations and Symbols for Projects and Programs Lists

Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete
D = Drought E = Earthquake ET = Extreme Temperatures F = Flooding (& related) ST = Severe Thunderstorms (& related) SWS = Severe Winter Storms	PR – planning & regulatory (includes data collection and research) IS – infrastructure & structures NS – natural systems protection AE – awareness & education EC – emergency communications, preparedness, & response	0-2 years 2-5 years 5+ years
Match with Local Goal(s)	**Cost of Project or Program**	**Prioritization**
1 - protect life 2 - protect critical facilities, infrastructure, and environmental health 3 - improve planning and regulatory pratices 4 - promote individual and community resiliency 5 - encourage communication and develop relationships	$ - no cost or thousands $$ - tens of thousands to hundreds of thousands $$$ - hundreds of thousands to millions $$$$ - tens of millions or greater	High ●●● Medium ●● Low ●

[70] "Handout 16-7: STAPLEE Criteria Worksheet," State and Local Mitigation Planning How-To Guide: Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies, FEMA, published 2003

Table 4.4: Mitigation Actions – Stephenson County

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
D1.1	Conduct countywide water demand and supply study	D	PR	2-5 years	• BHRC • Conservation organizations • Economic development entities • Fire protection districts/MABAS • IDNR • ISWS	3	• Gain knowledge of primary/alternative sources of water • Understand how and by whom water is used • Support conservation and economic development	• Coordination/communication • Staff time • State funding in limbo	$$	High ●●●
D1.2	Inventory water sources and determine suitability for use in firefighting	D	PR	0-2 years	• Fire protection districts/MABAS • SCEMA	1,2,3	• Increase firefighting capability/capacity	• Coordination/communication • Staff time	$	Low ●
Q1.1	Model how earthquakes might impact civic and government buildings, especially critical facilities	E	PR	2-5 years	• SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Create and distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
E1.1	Create and distribute heating/cooling centers map for public use	ET	AE	0-2 years	• Fire protection districts/MABAS • Freeport Housing Authority • SCEMA	1,4,5	• Support individual awareness and preparedness	• Distribution • GIS support • Program/material development • Staff time	$	Medium ●●
E1.2	Pursue upgraded or new heating/cooling centers	ET	IS	2-5 years	• Fire protection districts/MABAS • Freeport Housing Authority • SCEMA	1,4	• Ensure adequate capacity • Enhance security for administrators and users	• Cost of new construction/upgrades	$$$	Low ●
E1.3	Support weatherproofing programming/provide resources to residents countywide	ET	AE	Ongoing	• Freeport Housing Authority • SCEMA	4	• Reduce cooling/heating costs for residents and businesses	• Coordination/communication • Outreach/program funding	$$	Medium ●●
F1.1	Keep bridge piers clear of debris	F	NS	0-2 years	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	2	• Allow water to flow freely • Reduce dangerous currents • Improve aesthetics	• Staff time	$$	High ●●●
F1.2	Identify and prioritize river/stream banks for erosion control measures	F	NS	0-2 years	• Conservation organizations	2,3	• Reduce runoff • Improve water quality	• Coordination/communication	$$	Medium ●●
F1.3	Determine feasibility of bi-state Pecatonica River Watershed Alliance	F	PR	0-2 years	• Conservation organizations • County, township, and municipal officials • IDNR	2,3	• Develop relationships in-state and out-of-state • Develop comprehensive approach to flooding-related issues	• Coordination/communication • Staff time	$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
F1.4	Review existing stormwater management and erosion control ordinances for effectiveness (municipalities and unincorporated)	F	PR	0-2 years	• Stephenson County Zoning	2,3	• Determine whether ordinances include best management practices	• Staff time	$	Medium ●●
F1.5	Maintain existing streamgages on Pecatonica River	F	IS	Ongoing	• SCEMA • USGS	2,3	• Continue historical record collection; identify trends • Supply information about river's likely impacts on people, places, and infrastructure • Ability to forecast/predict river rise and fall	• Coordination/communication	$	High ●●●
F1.6	Install additional streamgages on Pecatonica River and Yellow Creek	F	IS	2-5 years	• SCEMA • USGS	3	• Ability to forecast/predict river rise and fall	• Coordination/communication • Cost of engineering/technical assistance	$$$	Medium ●●
F1.7	Conduct public NFIP/RLP outreach; provide information about CRS	F	AE	Ongoing	• SCEMA	4,5	• Reduce flood insurance rates	• Program/material development • Staff time	$	High ●●●
F1.8	Inspect non-accredited levees (e.g., near McConnell, etc.)	F	PR	2-5 years	• ACE • SCEMA	2	• Determine effectiveness and consequences of failure • Knowledge of influence on flooding upstream/downstream	• Cost of engineering/technical assistance	$$	Low ●
F1.9	Acquire drone for use during flooding/flash flooding events	F	EC	2-5 years	• SCEMA • Stephenson County Sheriff's Office	1	• Better plan rescue and recovery operations • Collect information about flooding extent for first responder and mapping functions	• Training and supporting operators	$$	Medium ●●
S1.1	Create storm shelter map for public use	ST	AE	0-2 years	• SCEMA	4	• Support individual awareness and preparedness	• Distribution • GIS support • Program/material development • Staff time	$	Medium ●●
S1.2	Construct a countywide storm warning system	ST	EC	2-5 years	• Fire protection districts/MABAS • Municipal officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$$	High ●●●
S1.3	Help municipalities become StormReady communities	ST	PR	2-5 years	• SCEMA	4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
W1.1	Develop evacuation/refugee plans for major transportation corridors (US 20, IL 73, IL 26, IL 75) or connect existing plans	SWS	EC	0-2 years	• American Red Cross • County, township, and municipal officials • SCEMA	1,4,5	• Formalize informal plans	• Coordination/communication	$	High ●●●
W1.2	Implement GPS tracking for selected county vehicles	SWS	PR	2-5 years	• SCEMA • Stephenson County Highway Department	5	• Direct resources where need • Real-time information about snow plowing status	• Coordination/communication • Cost of equipment, software, and licensing • Implementation issues	$$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
W1.3	Establish egress/regress routes for first responders and install signage in communities	SWS	PR	0-2 years	• FHN • Fire protection districts/MABAS • SCEMA • Stephenson County Highway Department • Stephenson County Sheriff's Office	1,2,3	• Formalize informal plans • Unencumber EMS, fire, and police resources	• Coordination/communication • Cost of signage	$	Medium ●●
O1.1	Develop Stephenson County capital improvement plan	O/AH	PR	0-2 years	• Stephenson County Highway Department	3	• Facilitate long-term strategic planning • Improved chance of coordinating county and municipal projects	• Coordination/communication • Cost of document	$$	Medium ●●
O1.2	Adopt Stephenson County continuity of government plan	O/AH	PR	0-2 years	• County officials	3,5	• Government services continue for constituents • Increased coordination between county departments	• Coordination/communication • Follow-through	$	High ●●●
O1.3	Encourage IPWMAN participation (municipal and unincorporated)	O/AH	EC	Ongoing	• Municipal officials • SCEMA • Stephenson County Highway Department	5	• Access to personnel and equipment not available locally • Build relationships with other jurisdictions • Formalize informal plans	• Yearly membership fee	$	High ●●●
O1.4	Maintain evacuation/refugee plan for nuclear incidents	O/AH	EC	0-2 years	• American Red Cross • Fire protection districts/MABAS • Municipal officials • SCEMA	1,4,5	• Formalize informal plans	• Coordination/communication	$	Medium ●●
O1.5	Ensure uniform awareness/preparedness literature and signage	O/AH	AE	Ongoing	• County, township, and municipal officials • SCEMA	5	• Improve understanding of role SCEMA and other entities play • Recognized readily by members of the public	• Coordination/communication	$	Medium ●●
O1.6	Install uniform signage at all sheltering facilities (municipalities and unincorporated)	O/AH	AE	0-2 years	• County, township, and municipal officials • SCEMA	5	• Recognized readily by members of the public	• Coordination/communication • Cost of signage	$	Medium ●●
O1.7	Establish digital assets redundancy plan	O/AH	PR	0-2 years	• County, township, and municipal officials	3,4	• Ensure availability for future generations and research • Recover records lost during disasters • Supports COG/COOP	• Coordination/communication	$	High ●●●
O1.8	Digitize government, historical, and other important documents; forward past and current plans to libraries for archival and public use	O/AH	PR	2-5 years	• County, township, and municipal officials • Libraries	4,5	• Ensure availability for future generations and research • Recover records lost during disasters	• Coordination/communication • Cost of scanning and archiving	$$	High ●●●
O1.9	Develop hazard mitigation and preparedness education/training for various stakeholders	O/AH	AE	0-2 years	• SCEMA	5	• Educate/train members of the public • Improve ability to respond to disaster by enhancing disaster literacy	• Encouraging public and official participation	$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.10	Develop a social media and website strategy for emergency management	O/AH	AE	0-2 years	• SCEMA	5	• Ensure content is timely, fresh, and useful • Improve ability to respond to disaster by enhancing disaster literacy	• Staff time	$	High ●●●
O1.11	Install dry hydrant at kayak launch on Farwell Bridge Rd	O/AH	IS	0-2 years	• Conservation organizations	1,2	• Increased firefighting capability	• Regulatory agency approval • Cost of construction • Susceptible to drought	$$	Low ●
O1.12	Support the Northern Illinois Next Generation Alliance (NINGA) and NG-9-1-1 implementation	O/AH	EC	5+ years	• Freeport Police Department • SCEMA • Stephenson County Sheriff's Office	1,2,5	• Ability to accept text and other forms of communication • Improved connectivity to other 9-1-1 PSAPs and systems	• Coordination/communication • Cost of equipment and implementation	$$$	High ●●●
O1.13	Update comprehensive plan and future land use map	O/AH	PR	2-5 years	• Conservation organizations • Freeport Park District • Stephenson County Zoning	3	• Master document from which all other documents are created • Direction for future development/redevelopment • Reconcile difference between local and county maps and plans	• Building public and official interest • Cost of planning	$$	High ●●●
O1.14	Install backup generators at county critical facilities (including Administration, Courthouse, Emergency Management, Health Department, Highway, and Sheriff facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.15	Construct operations, storage, professional development, and fire training facility to serve multiple jurisdictions (including Sheriff, Emergency Management, and MABAS)	O/AH	IS	2-5 years	• Fire protection districts/MABAS • SCEMA • Stephenson County Sheriff's Office	2	• Meet state/federal requirements for storing equipment and vehicles • Improve EOC • Useful to multiple agencies and organizations • Provide central facility for training/inspections/storage • Reduce long-term costs for training/inspections/storage	• Coordination/communication • Cost of construction	$$$$	High ●●●
O1.16	Create/update countywide map book for first responders	O/AH	EC	0-2 years	• Fire protection districts/MABAS • SCEMA • Stephenson County Sheriff's Office	1,2,4	• Off-line reference • Updated information to EMS, fire, and police	• Cost of mapping, compilation, and printing	$$	Medium ●●

Table 4.5: Mitigation Actions – Village of Cedarville

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Address localized ponding near Cedar/Washington St and Harrison Cir/Homestead Dr	F	IS	2-5 years	• Municipal officials	2,4	• Reduce local nuisance and damage to property	• Cost of engineering/technical assistance	$$	Medium ●●
F1.2	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
S1.1	Connect warning siren to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Address erosion near Oakridge Dr	O/AH	IS	2-5 years	• Municipal officials	2,4	• Reduce local nuisance and damage to property	• Cost of engineering/technical assistance	$$	Medium ●●
O1.2	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.3	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.4	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.5	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.6: Mitigation Actions – Village of Dakota

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	Low ●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.7: Mitigation Actions – Village of Davis

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Consider NFIP participation	F	PR	2-5 years	• Municipal officials • SCEMA	2,4	• Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	Low ●
F1.2	Pursue upgraded aerators and rock filter operating system for wastewater treatment plant	F	IS	2-5 years	• IEPA • Municipal officials • USDA	2	• Improve capacity and efficiency of system	• Cost of engineering/technical assistance, equipment, and installation	$$	Medium ●●
S1.1	Connect warning siren to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.5	Pursue alternatives/backups to radio repeater system	■ O/AH	⚠ EC	2-5 years	• Fire protection districts/MABAS • Municipal officials • SCEMA	4	• Ability to implement COOP/COG operations	• Cost of radio repeater system • Generator maintenance	$$$	Low ●

Table 4.8: Mitigation Actions – City of Freeport

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Determine impact of earthquakes to civic and government buildings, especially critical facilities	E	PR	2-5 years	• Freeport Housing Authority • Freeport Park District • Municipal and county officials • SCEMA	1,2	• Anticipate damage to structures • Take corrective or pursue preventive maintenance/upgrades	• Cost of engineering/technical assistance • Staff time	$$	Low ●
Q1.2	Determine what basic earthquake protections existing codes provide, if any	E	PR	0-2 years	• Municipal and county officials • SCEMA	3	• Anticipate damage to structures • Take corrective or pursue preventive maintenance/upgrades	• Staff time	$	Low ●
Q1.3	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Distribution • Program/material development	$	Low ●
E1.1	Create and distribute heating/cooling centers map for public use	ET	AE	0-2 years	• Fire protection districts/MABAS • Freeport Housing Authority • Municipal officials • SCEMA	1,4,5	• Support individual awareness and preparedness	• Distribution • GIS support • Program/material development • Staff time	$	Medium ●●
F1.1	Explore CRS participation	F	PR	2-5 years	• Freeport Housing Authority • Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F1.2	Continue land and property identification and acquisition in/nearby floodway/floodplain (voluntary basis)	F	NS	5+ years	• Freeport Park District • Municipal officials	1,2,4	• Direct development away from potential hazards/risk areas • Reduce flooding issues	• Cost of land acquisition • Individual/neighborhood reluctance	$$$$	High ●●●
F1.3	Create re-use (no-use) plan for acquired land/property in floodway/floodplain	F	NS	0-2 years	• Freeport Park District • Municipal officials	1,2,3,4	• Create park space/prairie habitat • Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services	$$	High ●●●
F1.4	Identify and acquire land to be purchased for a multi-hectare wetland restoration/water detention project	F	PR	5+ years	• Freeport Park District • Municipal officials	1,2,4	• Reduce East Side flooding issues	• Cost of engineering/technical assistance and land acquisition	$$$$	Medium ●●
F1.5	Fund visible, low cost, high impact bioswails and/or rain gardens	F	PR	2-5 years	• Developers • Freeport Park District • Municipal officials	2,4	• Improve aesthetics • Reduce flooding issues	• Cost of engineering/technical assistance and construction • Overall effectiveness during heavy/extreme rain events	$$	Low ●
F1.6	Incentivize and educate regarding the benefits of sewer backflow preventers	F	AE	2-5 years	• Municipal officials • SCEMA	2,4	• Protect individual homeowners • Reduced clean-up costs	• Cost of incentives • Potential impact on adjacent homeowners	$$$	Medium ●●
F1.7	Identify intersections and roadways prone to flooding	F	PR	0-2 years	• Municipal officials • SCEMA	1,2,4	• Reduce flooding issues	• Staff time	$	High ●●●
S1.1	Connect warning sirens to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$	High ●●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Update future land use map/comprehensive plan	O/AH	PR	2-5 years	• Freeport Housing Authority • Freeport Park District • Municipal officials	3	• Master document from which all other documents are created • Direction for future development/redevelopment • Reconcile difference between local and county maps and plans	• Building public and official interest • Cost of planning	$$	High ●●●
O1.5	Develop a social media and website strategy	O/AH	AE	0-2 years	• Municipal officials	5	• Ensure content is timely, fresh, and useful • Improve ability to respond to disaster by enhancing disaster literacy	• Staff time	$	High ●●●
O1.6	Support NINGA and NG-9-1-1 implementation	O/AH	EC	5+ years	• Freeport Police Department • SCEMA • Stephenson County Sheriff's Office	1,2,5	• Ability to accept text and other forms of communication • Improved connectivity to other 9-1-1 PSAPs and systems	• Coordination/communication • Cost of equipment and implementation	$$$	High ●●●
01.7	Prioritize and implement recommendations contained in the East Side Revitalization and Freeport Forward plans	O/AH	PR	Ongoing	• Municipal officials	1,2,3,4,5	• Address quality of service for residents and business • Reduce flooding issues	• Cost of engineering/technical assistance and construction • Overall effectiveness during heavy/extreme rain events • Staff time	$$$$	Medium ●●
O1.8	Adopt continuity of government plan and update public works recovery plan	O/AH	PR	0-2 years	• Municipal officials	3,5	• Government services continue for constituents • Increased coordination between city departments	• Coordination/communication • Follow-through	$	High ●●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.9	Revisit and update mutual aid agreements	O/AH	EC	2-5 years	• Municipal officials	2,5	• Additional public works resources in times of need • Increased coordination between other governments	• Coordination/communication	$	High ●●●
01.10	Continue studies of water system pressure	O/AH	IS	Ongoing	• Municipal departments	1,2,4	• Address quality of service for residents and business • Understand problem areas for firefighting	• Cost of engineering/technical assistance	$$	Medium ●●
01.11	Relocate and rebuild water production facility away from railway	O/AH	IS	5+ years	• IEPA • Municipal officials • USDA	1,2,4	• Affect numerous people and properties • Hardened infrastructure • Improved water delivery efficiency and operations • Reduced railway vulnerability	• Cost of new connections and land acquisition, decommissioning, and new water production facility	$$$$	High ●●●

Table 4.9: Mitigation Actions – Village of German Valley

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Consider NFIP participation	F	PR	2-5 years	• Municipal officials • SCEMA	2,4	• Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	Low ●
F1.2	Increase capacity of Church St and Rock City Rd culverts	F	PR	5+ years	• Municipal officials • IDOT • Stephenson County Highway Department • Townships	2	• Reduce flooding issues	• Cost of construction and engineering/technical assistance • Impact of other bottlenecks • Issues rare	$$$	Low ●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.10: Mitigation Actions – Village of Lena

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	Medium ●●
F1.2	Increase capacity of Town Line Rd culvert	F	PR	5+ years	• Municipal officials • IDOT • Stephenson County Highway Department • Townships	2	• Reduce flooding issues	• Cost of construction and engineering/technical assistance • Impact of other bottlenecks • Issues rare	$$$	Low ●
F1.3	Improve stormwater, wastewater, and water connections to Adkins Energy and village's industrial corridor	F	IS	5+ years	• BHRC • Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
F1.4	Dredge Lake Le-Aqua-Na	F	NS	5+ years	• ACE • IDNR • Lena Park District • Municipal officials • Tourism officials	2,4	• Address potential future flooding issues upstream and downstream • Support conservation and economic development	• Coordination/communication • Cost of dredging • State of Illinois	$$$$	Medium ●●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.5	Add curb cutouts and ramps, especially near special needs populations	O/AH	PR	5+ years	• IDOT • Municipal officials • Stephenson County Highway Department	1,2,5	• Improve access and mobility	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
O1.6	Develop brownfields redevelopment plan for Canadian National Railway corridor	O/AH	PR	2-5 years	• IEPA • Municipal officials • Canadian National Railway	3	• Create buffers between different modes of transportation • Focus municipal goals with respect to community and economic development • Remediate brownfields	• Cost of engineering/technical assistance • Staff time	$$	Medium ●●

Table 4.11: Mitigation Actions – Village of Orangeville

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F1.2	Continue land and property acquisition in/nearby floodway/floodplain (voluntary basis)	F	NS	5+ years	• IEMA/FEMA • Municipal officials • SCEMA	1,2	• Address properties persistently exposed to flooding • Reduce costs associated with cleanup	• Cost of acquisition • Not all property owners want to leave, even with fair compensation	$$$	High ●●●
F1.3	Create re-use (no-use) plan for acquired land/property in floodway/floodplain	F	NS	2-5 years	• Conservation organizations • Municipal officials	3	• Create park space/prairie habitat • Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services	$	High ●●●
F1.4	Floodproof or relocate fire department training facility	F	IS	2-5 years	• Fire protection districts/MABAS • Municipal officials • SCEMA	1,2,4	• Prevent flooding from interfering with training	• Cost of floodproofing/relocating training facility	$$	Low ●
F1.5	Remove debris from Richland Creek	F	NS	2-5 years	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	1,2	• Protect bridge from damage caused by debris and pressure from ice jams • Reduce potential for flooding	• Organizing workers/volunteers	$	High ●●●
F1.6	Identify and prioritize river/stream banks for erosion control measures	F	NS	2-5 years	• Conservation organizations • IDNR • Municipal officials	2	• Prevent damage to property • Reduce potential for flooding	• Cost of study	$	Medium ●●
F1.7	Study Richland Creek bottlenecks and increase culvert capacity where appropriate (especially Ewing St)	F	IS	2-5 years	• ACE • IDOT • Municipal officials • SCEMA • Stephenson County Highway Department • Townships	1,2,3	• Improved understanding of Pecatonica River flows • Supports targeted investment in new infrastructure	• Cost of study	$$	Medium ●●
F1.8	Keep High St bridge piers clear of debris	F	NS	Ongoing	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	1,2	• Protect bridge from damage caused by debris and pressure from ice jams • Reduce potential for flooding	• Organizing workers/volunteers	$	High ●●●
F1.9	Loop water system to Richland Crossing commercial subdivision	F	IS	2-5 years	• BHRC • Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
F1.10	Extend wastewater system to residents south of village limits (Freeport Rd)	F	IS	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
F1.11	Address stormwater drainage on Mill St	F	IS	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of bridge/culvert improvements • Cost of stormwater system improvements	$$$	Medium ●●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
S1.5	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	ST	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
S1.6	Upgrade village hall/community building to provide all hazards shelter	O/AH	IS	5+ years	• Municipal officials	1,2,4	• High-quality construction materials • Protection from all hazards	• Cost of incorporating all hazards shelter • Long-term maintenance challenge	$$$	Medium ●●
O1.1	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.2	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.3	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.12: Mitigation Actions – Village of Pearl City

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F1.2	Pursue land and property acquisition in/nearby floodway/floodplain (voluntary basis)	F	NS	5+ years	• IEMA/FEMA • Municipal officials • SCEMA	1,2	• Address properties persistently exposed to flooding • Reduce costs associated with cleanup	• Cost of acquisition • Not all property owners want to leave, even with fair compensation	$$$$	High ●●●
F1.3	Create re-use (no-use) plan for acquired land/property in floodway/floodplain	F	NS	2-5 years	• Conservation organizations • Municipal officials	3	• Create park space/prairie habitat • Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services	$	High ●●●
F1.4	Address ponding near IL 73/Pearl City Rd	F	IS	5+ years	• IDOT • Municipal officials	2,4	• Improve access to village	• Cost of bridge/culvert improvements • Cost of stormwater system improvements	$$$	Medium ●●
F1.5	Study Yellow Creek bottlenecks and increase culvert capacity where appropriate	F	IS	2-5 years	• ACE • IDOT • Municipal officials • SCEMA • Stephenson County Highway Department • Townships	1,2,3	• Improved understanding of Yellow Creek flows • Supports targeted investment in new infrastructure	• Cost of study	$$	Medium ●●
S1.1	Connect warning siren to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.13: Mitigation Actions – Village of Ridott

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F1.2	Elevate/protect route and structures for proposed bicycle path near floodplain/floodway	F	IS	5+ years	• Conservation organizations • IDNR • Municipal officials • Tourism officials	1,2,4	• Ensure accessibility year-round • Reduce maintenance burden • Support local businesses and tourism	• Cost of improved bicycle path	$$	Medium ●●
F1.3	Improve park drainage system	F	IS	5+ years	• Municipal officials	2	• Determine how water flows within system • Improve park availability	• Cost of inspection • Cost of drainage system improvements	$$	Medium ●●
F1.4	Install removable boat dock/launch	F	IS	5+ years	• IDNR • Municipal officials	2	• Greater flexibility when Pecatonica River floods	• Cost of boat dock/launch installation • Boat dock/launch maintenance	$$	Low ●
F1.5	Raise and divert water from Cherry Hill Rd	F	IS	5+ years	• Municipal officials • Stephenson County Highway Department • Townships	1,2	• Improve access to residents/businesses • Reduce maintenance burden	• Cost of roadway improvements • Availability of alternative routes	$$$	Low ●
F1.6	Inspect and flush pipe and tile system	F	IS	2-5 years	• Municipal officials	2	• Determine how water flows within system • Improve park availability	• Cost of inspection • Cost of pipe and tile system improvements	$$	Medium ●●
F1.7	Update floodplain ordinance	F	PR	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.5	Upgrade village hall/community building to provide all hazards shelter	O/AH	IS	5+ years	• Municipal officials	1,2,4	• No current indoor community gathering site • Preservation-worthy facility	• Condition of facility • Cost of incorporating all hazards shelter • Long-term maintenance challenge	$$$	Medium ●●

Table 4.14: Mitigation Actions – Village of Rock City

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Consider NFIP participation	F	PR	2-5 years	• Municipal officials • SCEMA	2,4	• Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	Low ●
F1.2	Reduce pervious surface along Main St by introducing bioswails/rain gardens	F	IS	5+ years	• Municipal officials	2,4	• Beautification of historic central business district • Improve water absorption and channeling	• Cost of bioswails/rain gardens • Lack of urgency	$$	Low ●
F1.3	Address ponding at Main St/IL 75	F	IS	5+ years	• IDOT • Municipal officials	2,4	• Improve access to village	• Cost of stormwater system improvements • Lack of urgency	$$	Low ●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.5	Upgrade/replace pumping equipment for both wells	O/AH	IS	2-5 years	• Municipal officials • USDA	1	• Avoid boil orders by maintaining system pressure	• Cost of upgraded/new pumps	$$	Medium ●●

Table 4.15: Mitigation Actions – Village of Winslow

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
Q1.1	Scenario plan impact of earthquake on historic central business district and governmental services	E	PR	2-5 years	• Municipal officials • SCEMA	1,2,3	• Understand potential structural integrity issues	• Cost of engineering/technical assistance	$$	Low ●
Q1.2	Distribute earthquake primer for homeowners, realtors, landlords, and tenants	E	AE	0-2 years	• Municipal officials • Realtors • SCEMA	4,5	• Support individual awareness and preparedness	• Coordination/communication • Program/material development • Distribution	$	Low ●
F1.1	Explore CRS participation	F	PR	2-5 years	• Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F1.2	Keep Winslow Rd bridge piers clear of debris	F	NS	Ongoing	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	1,2	• Protect bridge from damage caused by debris and pressure from ice jams • Reduce potential for flooding	• Organizing workers/volunteers	$	High ●●●
F1.3	Replace catch basin covers/catch basins	F	IS	Ongoing	• Municipal officials	1,2	• Support proper drainage • Improve public safety • Opportunity to impact numerous people and properties	• Cost of catch basin covers/catch basins	$$	High ●●●
F1.4	Promote residential/commercial sump pump installation within historic central business district	F	AE	2-5 years	• Community organizations • Municipal officials	4	• Protect interiors of residential/commercial properties • Add value to property	• Cost of promotion • Need to ensure proper drainage after pumping	$	Low ●
F1.5	Improve berms/elevation at wastewater treatment plant	F	IS	5+ years	• IEPA • Municipal officials • USDA	2	• Protect against inundation during extreme flooding events	• Marginal benefit associated with improving berms/elevation	$$$	Low ●
F1.6	Relocate fire station outside of floodway/floodplain	F	IS	5+ years	• Fire protection districts/MABAS • Municipal officials	1,2,4	• Prevent flooding from impacting fire equipment and access • Free existing property for other uses • Reduce pedestrian/traffic hazards • Affect numerous people and properties	• Cost of new fire station	$$$	Medium ●●
F1.7	Floodproof or relocate museum	F	IS	2-5 years	• Municipal officials • Museum officials	4	• Prevent flooding from impacting artifacts and displays	• Cost of flood-proofed/new museum	$$$	Low ●
S1.1	Install stand-alone outdoor warning siren; connect to countywide system	ST	EC	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
S1.2	Harden existing or construct new sheltering facilities	ST	IS	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for residents and visitors	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
S1.3	Pursue StormReady certification	ST	AE	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
S1.4	Consider Tree City USA status	ST	NS	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●

#	Hazard Mitigation Action	Primary Hazard Addressed	Primary Action Type	Estimated Time to Complete	Potential Partner or Responsibility	Match with Local Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Cost of Project or Program	Prioritization
O1.1	Install backup generators at village critical facilities (including Administration, Fire, Police, sheltering, wastewater treatment, and water tower facilities)	O/AH	IS	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	O/AH	PR	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	O/AH	IS	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	O/AH	PR	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.5	Upgrade village hall/community building to provide all hazards shelter and police station	O/AH	IS	5+ years	• Municipal officials	1,2,4	• Centrally located • High-quality construction materials • Protection from all hazards	• Cost of incorporating all hazards shelter • Cost of incorporating police station • Long-term maintenance challenge stemming from facility size	$$$	Medium ●●
O1.6	Replace School St bridge	O/AH	IS	0-2 years	• Municipal officials • Stephenson County Highway Department • Townships	2	• Enhanced first responder access and coverage • Improve decreased weight limit • Maintain evacuation routes	• Cost of culvert and/or bridge replacement	$$$	High ●●●

CHAPTER 5: POST-PLANNING

CHAPTER 5: POST-PLANNING/IMPLEMENTATION

OVERVIEW

This chapter addresses adoption, the integration of the 2016 hazard mitigation plan into participating jurisdictions' planning documents as a long-term strategy, and how to effectively monitor the plan.

ADOPTION

Each participating jurisdiction was responsible for approving a resolution to adopt the updated plan. As concerns the timeline, after receiving plan approval from IEMA, the county and each municipality were asked to adopt the plan (most officials used and/or modified a resolution template provided). These official documents were inserted into the plan following IEMA approval.

INTEGRATION, IMPLEMENTATION, & ADMINISTRATION

With the exception of Freeport and Stephenson County, most municipal plans are informal, considerably dated, or do not exist; as such, any formal integration of this plan will take place only when local elected officials/staff develop current and relevant documents (e.g., comprehensive plans, future land use plans, capital improvement plans, etc.). It will be pertinent to assign in each village an individual responsible for overseeing integration before such planning documents are created. Even without these documents, that particular individual – along with his or her fellow officials or staff – will be tasked with injecting hazard mitigation into official discussions (especially with respect to projects and programs listed in this document for the particular jurisdiction).

In Freeport, the Community Development Department will coordinate efforts between relevant city agencies (e.g., Public Works, Police, Fire, etc.) and department heads (Superintendents, Chiefs, etc.) to ensure proper integration of the 2016 plan. Existing planning documents should be reviewed and interpreted with the 2016 hazard mitigation plan in mind. This process should be coordinated by the Community Development Director, Grants Coordinator, and public safety/emergency management-related departments. New planning documents or updates to planning documents should be prepared in a similar fashion. At the county level, the Director of SCEMA will coordinate efforts along with various departments (e.g., Highway, Sheriff, Zoning, etc.). In the case of Freeport and Stephenson County, interdepartmental memorandums of understanding should be established.

As with integration, implementation and administration responsibilities will be borne primarily by SCEMA, as well as each municipality's community development contact (or equivalent official/staff).

MAINTAINING, MONITORING, EVALUATING, & UPDATING THE PLAN

Each agency or equivalent should maintain a running list of actions completed, as well as any projects or programs (included in the plan or not) that support the goals and objectives included in the plan. At the end of each calendar year, SCEMA should reach out to each municipality and collect lists of ongoing or completed projects and programs (one month prior, SCEMA should prompt municipalities with a reminder). This information should be added to a countywide record-keeping document. Then, the core committee (i.e., five or fewer members of the planning committee) should meet at least once every year, after SCEMA has updated the countywide document.

Changes to the 2016 plan will require written updates to the document (lead by SCEMA) and the approval of each jurisdiction included in the document.

Public Participation

Meetings of the core committee and planning committee should be designed to include members of the public. In particular, meeting notices should be distributed to the media and posted to social media/websites in advance of any committee meetings. The following table proposes a meeting schedule going forward.

Table 5.1: Maintenance and Public Participation Schedule

2017	2018	2019	2020	2021
• SCEMA collects/analyzes data for 2016 in January. Meeting notice is distributed. • Core committee meets in February to evaluate.	• SCEMA collects/analyzes data for 2017 in January. Meeting notice is distributed. • Core committee meets in February to evaluate.	• SCEMA collects/analyzes data for 2018 in January. Meeting notice is distributed. • Core committee meets in February to evaluate. • Official planning begins for 2021-2026 update; planning committee assembled.	• SCEMA collects data for 2019 in January. Meeting notice is distributed. • Core committee meets in February to evaluate. • Planning committee begins meetings.	• SCEMA collects data for 2020 in January. Meeting notice is distributed. • Core committee meets in February to evaluate. • Planning committee finishes latest round of meetings and submits/adopts updated document before the 2016-2021 plan expires.
Ongoing: collect data on completed projects and programs (municipalities and unincorporated)				

APPENDIXES

APPENDIXES A - H

Appendix A: Abbreviations & Acronyms

Appendix B: Terms

Appendix C: Agendas, Minutes/Notes, Press Releases, Social Media, & Media Coverage

Appendix D: Hazard Events

Appendix E: Tier II Facilities

Appendix F: Survey Results

Appendix G: Resolutions by Jurisdiction

Appendix H: Mission Statement

Appendix A: Abbreviations & Acronyms

BCA	Benefit-Cost Analysis
BHRC	Blackhawk Hills Regional Council
CBD	Central Business District
CDC	Centers for Disease Control
CEDS	Comprehensive Economic Development Strategy
COG	Continuity of Government
COOP	Continuity of Operations Plan
CRS	Community Ratings System
DFIRM	Digital Flood Insurance Rate Map
FAA	Federal Aviation Administration
FIRM	Flood Insurance Rate Map
FCDD	Freeport Community Development Department
FEMA	Federal Emergency Management Agency
IDNR	Illinois Department of Natural Resources
IDOT	Illinois Department of Transportation
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
IPWMAN	Illinois Public Works Mutual Aid Network
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
MABAS	Mutual Aid Box Alarm System
NCDC	National Climatic Data Center
NDMC	National Drought Mitigation Center
NIBS	National Institute of Building Sciences
NIDA	Northwest Illinois Development Alliance
NINGA	Northern Illinois Next Generation Alliance
NFR	No Further Remediation
NFIP	National Flood Insurance Program
NCEI	National Centers for Environmental Information
NOAA	National Oceanic and Atmospheric Administration
NSSL	National Severe Storms Laboratory
NWS	National Weather Service
RL	Repetitive Loss
SCEMA	Stephenson County Emergency Management Agency
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
THIRA	Threat and Hazard Identification and Risk Assessment
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled

Appendix B: Terms

- **Asset:** could be a person, place, or thing (including community assets)
- **Hazard:** "a natural, technological, or human-caused source or cause of harm or difficulty."[71] Similar to threat
- **Extent:** "the strength or magnitude of the hazard"[72]
- **Impact:** "the consequence or effect of the hazard"[73]
- **Location:** "the geographic areas in the planning area affected by the hazard"[74]
- **Natural hazard:** "a source of harm or difficulty created by a meteorological, environmental, or geological event"[75]
- **Probability:** "the likelihood of the hazard occurring"[76]
- **Repetitive loss:** see Hazard Profiles: Flooding (& related)
- **Risk:** at the intersection of assets and hazards (threats). Risks are articulated by describing the impacts of a hazard (threat) on an asset. Some liken risks to the sum of all hazards (threats), assets, and vulnerability. Others define risk "as the potential for an unwanted outcome resulting from an incident or occurrence, as determined by its likelihood and the associated consequences"[77]
- **Risk assessment:** a process; FEMA notes that "conducting a risk assessment provides the foundation for the rest of the hazard mitigation planning process. The four basic components of a risk assessment are to: 1) identify hazards; 2) profile hazard events; 3) inventory assets and 4) estimate losses. This process estimates potential loss of life, personal injury, economic injury, and property damage by assessing the exposure and vulnerability of people, buildings, and infrastructure to different natural hazards"
- **Threat:** "any indication, circumstance, or event with the potential to cause loss of or damage to an asset" (including digital assets, information, knowledge, etc.)[78] Similar to hazard

[71] "Developing and Maintaining Emergency Operations Plans," FEMA, published November 2010
[72] "Local Mitigation Plan Review Guide," FEMA, published October 1, 2011
[73] Ibid
[74] Ibid
[75] Ibid
[76] Ibid
[77] "DHS Risk Lexicon: 2010 Edition," U.S. Department of Homeland Security, published September 2010
[78] "Threat Assessment," FEMA 455: March 2009, FEMA, last accessed April 8, 2016

Appendix C: Agendas, Minutes/Notes, Press Releases, Social Media, & Media Coverage

Starts on next page. Includes documents for/from planning committee meetings.

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Blackhawk Hills
REGIONAL COUNCIL
102 E Rte 30, Ste 3
Rock Falls, IL
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MEETING NOTICE

WHAT? Stephenson County Multi-Hazard Mitigation Planning Committee
DATE: September 21, 2015
TIME: 10 AM – 11:30 AM
LOCATION: Stephenson County Farm Bureau, 210 W Spring St, Freeport, IL
AGENDA:

Topic	Preparation	Approach/Process
1. Introductions TIME: 5 minutes PURPOSE: acquaint members with each another LEADER: Payette	None	None
2. Overview of multi-hazard mitigation planning process; discuss process goals and plan mission statement TIME: 20 minutes PURPOSE: learn about the process LEADER: Baker, Payette	None	Presentations and discussion
3. Review hazard occurrences and events since last update TIME: 10 minutes PURPOSE: consider additions and corrections LEADER: Baker, Payette	Skim 2008 plan occurrences and events	Discussion and worksheets
4. Begin hazard identification and profiling TIME: 30 minutes PURPOSE: begin to identify hazards and construct profiles; assess capabilities; identify assets, resources, and vulnerabilities LEADER: Baker, Payette	Skim 2008 plan hazards and profiles	Presentations, discussion, and worksheets
5. Distribute maps TIME: 5 minutes PURPOSE: prepare for future meetings LEADER: Baker, Payette	None	Homework
6. Discuss responsibilities, additional participants, outreach strategy, and meeting schedule TIME: 20 minutes PURPOSE: ensure committee, stakeholder, and public participation LEADER: Payette	Review your calendar for October and November availability; consider upcoming major community events	Discussion
Anticipated future agenda/discussion items: • Continue hazard identification and profiling • Continue to review 2008 plan; review achievements since plan implementation • Identify critical infrastructure/key resources • Review priorities and goals; review mitigation actions, including projects and programs • Set new/revised priorities, goals, and mitigation actions		

CONTACTS:

- Robert Baker, Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
- Nick Jupin, City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
- Daniel Payette, Blackhawk Hills Regional Council, Outreach Coordinator, 815-625-3854, daniel.payette@blackhawkhills.com

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MEETING NOTICE

WHAT? Stephenson County Multi-Hazard Mitigation Planning Committee
DATE: October 20, 2015
TIME: 2:30 PM – 4 PM
LOCATION: Stephenson County Farm Bureau, 210 W Spring St, Freeport,
AGENDA:

Topic	Preparation	Approach/Process
1. Introductions TIME: 5 minutes PURPOSE: acquaint members with each another LEADER: Payette	None	None
2. Review of progress, including mission and goals TIME: 15 minutes PURPOSE: synopsis of kick-off meeting; refine mission and goals LEADER: Baker, Payette	None	Discussion
3. Continue hazard identification and profiling TIME: 30 minutes PURPOSE: continue to identify hazards and construct profiles; assess capabilities; identify assets, resources, and vulnerabilities LEADER: Baker, Payette	Skim 2008 plan hazards and profiles; review kick-off discussion	Discussion and worksheets
4. Begin risk assessment and review county-wide goals, projects, and programs TIME: 40 minutes PURPOSE: begin risk assessment, review previous goals, identify project and program achievements, and identify new goals LEADER: Baker, Payette	Skim 2008 plan goals, projects, and programs; note achievements	Presentation, discussion, and worksheets

CONTACTS:

- Robert Baker, Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
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MEETING NOTICE

WHAT? Stephenson County Multi-Hazard Mitigation Planning Committee
DATE: December 29, 2015
TIME: 6 PM – 7:45 PM
LOCATION: Globe Room, FHN Memorial Hospital, 1045 W Stephenson St, Freeport, IL
AGENDA:

Topic	Preparation	Approach/Process
1. Introductions TIME: 6 p.m. PURPOSE: acquaint members with each another, approve amended mission statement LEADER: Payette	Review amended mission statement	None
2. Neighboring jurisdictions TIME: 6:05 p.m. PURPOSE: generate awareness about neighboring projects and programs LEADER: Payette	Write down projects that Stephenson County could partner with other counties on	Discussion
3. Complete risk assessment TIME: 6:20 p.m. PURPOSE: present on public survey and community meetings, approve natural hazards ranking, approve addition of other hazards LEADER: Baker, Payette	Review natural hazards ranking and addition of other hazards	Discussion
4. Complete goal setting TIME: 6:30 p.m. PURPOSE: approve amended goals; review priorities LEADER: Payette	Review amended goals	Breakouts and discussion
5. Review actions; begin prioritization process TIME: 6:45 p.m. PURPOSE: review community assets and capabilities, review completed projects/programs, list projects, approve BCA approach LEADER: Baker, Payette	Review completed projects/programs	Breakouts and discussion
6. Consider action plan and maintenance TIME: 7:30 p.m. PURPOSE: discuss county and municipal resolutions, discuss action plan, discuss roles and responsibilities for implementation, discuss plan for maintaining document LEADER: Payette	Consider who should be responsible for what	Discussion
7. Set next meeting date and time TIME: 7:40 p.m.	Review availability	None

CONTACTS:

- Robert Baker, Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
- Nick Jupin, City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
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MEETING NOTICE

WHAT? Stephenson County Multi-Hazard Mitigation Planning Committee
DATE: February 22, 2016
TIME: 6 PM – 7:45 PM
LOCATION: Globe Room, FHN Memorial Hospital, 1045 W Stephenson St, Freeport, IL
AGENDA:

Topic	Preparation	Approach/Process
1. Introductions TIME: 6 p.m. PURPOSE: final introductions, acknowledge public participation LEADER: Payette	None	None
2. Finalize action plan; set priorities TIME: 6:05 p.m. PURPOSE: revisit actions (projects and programs), complete before/after assessment of vulnerability, complete BCA LEADER: Payette	Review list of actions (projects and programs)	Breakouts and discussion
3. Finalize post-planning activities TIME: 7:05 p.m. PURPOSE: distribute template resolution of adoption, discuss implementation (including roles and responsibilities), finalize approach to document maintenance, discuss evaluation/measures of success LEADER: Payette	Consider stakeholders that should be included during implementation	Discussion
4. Discuss plan integration and public comment period TIME: 7:25 p.m. PURPOSE: highlight existing and/or future county and municipal plans, set public comment period, confirm locations of public displays/outreach LEADER: Payette	Consider ideal locations for public displays/outreach	Discussion
5. Review planning process (2015 to 2016) TIME: 7:35 p.m. PURPOSE: discuss what worked and what did not LEADER: Baker, Payette	Consider planning process (2015 to 2016)	Discussion

CONTACTS:

- Robert Baker, Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
- Nick Jupin, City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
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September 11, 2015
For Immediate Release

Countywide Multi-Hazard Mitigation Planning Committee to Meet
Committee to begin to review existing plan and re-identify hazards

The Stephenson County Multi-Hazard Mitigation Planning Committee will meet on September 21, 2015, at 10 a.m. at the Stephenson County Farm Bureau (210 W Spring St, Freeport, IL). The committee will begin the process of reviewing and updating the current countywide multi-hazard mitigation plan, published in 2008.

Coordinating this effort are the Stephenson County Emergency Management Agency, the City of Freeport, and Blackhawk Hills Regional Council, northwest Illinois' regional planning commission. Residents of Cedarville, Dakota, Davis, Freeport, German Valley, Lena, Orangeville, Pearl City, Ridott, Rock City, Winslow, and in unincorporated areas of Stephenson County are encouraged to participate.

One of the primary objectives of the planning process is to ensure that municipalities in Stephenson County remain eligible for state and federal hazard mitigation funding, which can be used to improve, rebuild, or make local infrastructure – such as roadways and bridges – resilient. Initially, the committee will re-identify local/regional natural hazards, consider past/future priorities, projects, and programs, and set a meeting schedule.

You may contact any of the following individuals with questions about attending or participating.

- **Robert Baker,** Stephenson County, SCEMA Director, 815-599-0344, robert.baker@stcoema.org
- **Nick Jupin,** City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
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October 13, 2015
For Immediate Release

Countywide Multi-Hazard Mitigation Planning Committee to Reconvene

Committee to continue to re-identify hazards and establish plan priorities

The Stephenson County Multi-Hazard Mitigation Planning Committee will meet on October 20, at 2:30 p.m. at the Stephenson County Farm Bureau (210 W Spring St, Freeport, IL). The committee will continue to re-identify local/regional natural hazards and consider priorities, projects, and programs for the new 2016-2020 plan. Coordinating this effort are the Stephenson County Emergency Management Agency, the City of Freeport Community Development Department, and Blackhawk Hills Regional Council, northwest Illinois' regional planning commission.

You may contact any of the following individuals with questions about attending or participating.

- **Robert Baker,** Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
- **Nick Jupin,** City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
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December 17, 2015
For Immediate Release

Countywide Multi-Hazard Mitigation Planning Committee to Meet December 29

Committee to discuss mitigation strategies for flooding, severe storms, other hazards

The Stephenson County Multi-Hazard Mitigation Planning Committee will meet on December 29, at 6 p.m., at FHN Memorial Hospital in Freeport, IL (1045 W Stephenson St). The committee will discuss strategies to address flooding, severe storms, and other hazards. Results of a community survey will also be presented. Coordinating this effort are the Stephenson County Emergency Management Agency, the City of Freeport Community Development Department, and Blackhawk Hills Regional Council, northwest Illinois' regional planning commission. The public is welcome and encouraged to attend.

You may contact any of the following individuals with questions about attending or participating:

- **Robert Baker,** Stephenson County, EMA Director, 815-599-0344, robert.baker@stcoema.org
- **Nick Jupin,** City of Freeport, Grants Coordinator, 815-599-5810, njupin@cityoffreeport.org
- **Daniel Payette,** Blackhawk Hills Regional Council, Outreach Coordinator, 815-625-3854, daniel.payette@blackhawkhills.com

###

Emergency Management Agency
STEPHENSON COUNTY
295 W Lamm Rd
Freeport, IL 61032
www.stcoema.org

Community Development Department
CITY OF FREEPORT
524 W Stephenson St, Ste 330
Freeport, IL 61032
www.ci.freeport.il.us

Blackhawk Hills
REGIONAL COUNCIL
102 E Rte 30, Ste 3
Rock Falls, IL
www.blackhawkhills.com

Media Contact:
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February 10, 2016
For Immediate Release

Hazard Mitigation Committee to Meet February 22

Final meeting to discuss hazard mitigation actions and implementation

What disaster planning and hazard mitigation projects are important to you? Let your voice be heard! The Stephenson County Multi-Hazard Mitigation Planning Committee will meet on February 22, at 6 p.m., at FHN Memorial Hospital's Globe Room in Freeport, IL (1045 W Stephenson St). The committee will complete project and program prioritization and discuss implementation plans, including maintenance over time. Coordinating this effort are the Stephenson County Emergency Management Agency, the City of Freeport Community Development Department, and Blackhawk Hills Regional Council, northwest Illinois' regional planning commission. The public is welcome and encouraged to attend.

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December 2, 2015
For Immediate Release

Countywide Hazard Mitigation Survey Available to the Public

The Stephenson County-focused survey is available online and in person until December 18, 2015

The Stephenson County Multi-Hazard Mitigation Planning Committee encourages individuals 18 years or older and living or working in Stephenson County to complete a short 12-question survey. Responses will be accepted until December 18, 2015, at www.stephensonplan.org. The planning committee encourages online submissions. For those without Internet access, paper copies will be available for pick-up and drop-off at the following locations starting December 4:

Cedarville
- Cedarville Village Hall (430 W Washington St)

Freeport
- Freeport Police (320 W Exchange St)
- Freeport Community Development Department (524 W Stephenson St, Ste 330)
- Freeport Fire Administration (1650 S Walnut)
- Freeport Housing Authority (1052 W Galena Ave)
- Freeport Park District (1122 S Burchard Ave)
- Freeport Public Library (100 E Douglas St)
- Freeport School District (501 E South St)
- Star Ambulance (3155 US Rte 20 W)
- Stephenson County Farm Bureau (210 W Spring St)
- Stephenson County Clerk and Recorder (50 W Douglas St, Ste 500)

Lena
- Lena Public Library (300 W Mason St)
- Lena Village Hall (122 E Main St)

Orangeville
- Community Bank of Orangeville (401 S Church St)

Pearl City
- Pearl City Public Library (221 S Main St)

Rock City
- Tri-District Ambulance (108 Main St)

Winslow
- Community Bank of Winslow (233 Carver St)

You may contact any of the following individuals with questions or if you need help finding a survey to complete:
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Minutes/Notes

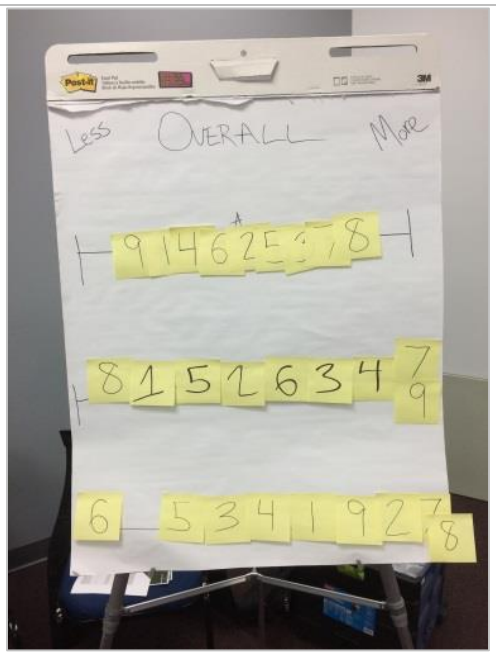
Minutes and Notes from September 21, 2015

- Welcome and introduction of participants included name, position, and years living in or associated with Stephenson County. Ranged from a handful of years to more than sixty-five years. Most have a long-term connection with the county. Included one member of the public.
- Discussion of the plan update process; addressed planning and research, drafting of the plan, submission to IEMA and FEMA, and adoption by each jurisdiction.
- Noted that an updated plan was critical for certain funding eligibility; explained that the current plan had expired; emphasized that time is of the essence.
- Discussion of documentation needs (including who was involved in the planning process and how reach out to involve neighboring communities and agencies).
- Listed "must-haves," including the existing plan, other studies and reports, public participation, plan maintenance, and plans for adhering to the five-year update cycle.
- Listed additional "must-haves," including addressing all natural hazards that impact each jurisdiction, including type, previous occurrences, probability, vulnerability, repeated NFIP-covered structure damage, documentation of each jurisdiction's compliance with NFIP, goals to reduce vulnerability, and identification and analysis of mitigation projects.
- Addressed FEMA guidance for updates, including: review of previous plan, scope and schedule of new plan, outreach strategy, identification of stakeholders, and documentation of the process (e.g., minutes, agendas, and PR efforts, etc.).
- Deliverables were discussed, including a listing of potential hazards, profiling hazard events, inventorying assets, and estimating losses. Also discussed assessment of mitigation capabilities, strategies, measures, and the action plan. Noted at meeting that FEMA wants to see a plan for ongoing evaluation, integration with other programs, and continued public involvement.
- Goals for the process and possible mission statements were discussed. Participants were asked what they wanted to get out of the planning process:
    - Ensure availability of grant funds by compliance with requirements
    - Familiarity with other community's needs
    - Help educate entities about hazard planning and the importance of it
    - Outreach to the public that a plan is being implemented and existence of the plan
- Mission statement discussion:
    - Protection of life and property are important
    - What about Stephenson County is worth protecting?
    - Include environment in addition to life and property
    - Statement to be community based, more inclusive of other communities (whole vs. part)
    - Maintain plan to efficiently handle disaster when it arises to have continuity when disruptions occur
- Discussed how risk is at the intersection of natural hazards and community assets (using a Venn diagram).
- A hazard identification/initial profile exercise was introduced. Four small groups ranked local hazards' that had/continue to impact Stephenson County. Drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms were included. The larger group debated adding moving soil/subsidence. Water table contamination was also mentioned. Most groups had similar rankings with one exception: while most groups ranked flooding the highest, one group saw severe thunderstorms as the greatest threat. Discussion followed; they felt severe thunderstorms had a higher potential for loss of life and property, and were more sudden. They perhaps have a greater dollar amount of damage or harm, rather than flood (later discussion would elevate severe thunderstorms' ranking).

- Discussed flood map handout, flooding terminology, and flooding in the county in general. Floodway and floodplain, A vs. AE, etc., addressed.
- A major FIRM update was introduced in March 2015; previous was 2011 for much of the county. A large change was noted:
    - Yellow Creek floodway near Freeport is now delineated, which greatly limits development in that area
    - Pecatonica River floodway covering Freeport's east side is perhaps too aggressive and covers areas less likely to carry moving floodwater
- Questions: can we identify additional areas vulnerable and/or prone to natural hazards? Are there local datasets for historical/previous flooding?
- Homework: review changes from 2008 to today; review plan for accuracy.
- Next meeting scheduling.

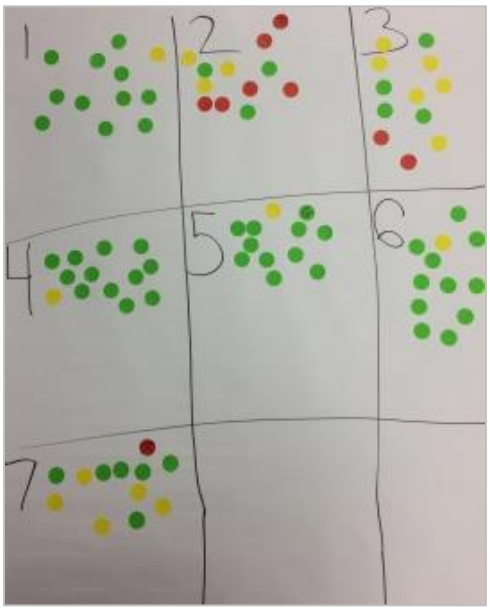
Minutes and Notes from October 20, 2015

- Introductions made by those present. Freeport police and fire departments were represented this month. Also included more municipal and county officials.
- Process timeline was highlighted. This is the second of five meetings planned to be held. The final three were tentatively set for 12/2015, 1/2016, and 3/2016 (later on, planning committee/lead agencies adjusted dates and divided 3/2016 meeting into two public comment sessions for late April).
    - Draft plan expected at the January 2016 meeting (draft delayed until March)
    - Local jurisdictions will be met one-on-one over the next two months (period extended in 2016)
    - A public survey will be distributed and compiled from 10/2015 to 12/2015 (distribution somewhat delayed)
    - Will seek public comments in early 2016 (period delayed until late April)
- Submission discussed. IEMA preliminary plan approval, followed by resolutions of adoption.
- Finalization of the mission statement was discussed.
    - "Update, implement, and maintain a multi-hazard mitigation plan for Stephenson County that ensures disaster resiliency and emphasizes the following priorities: public engagement, community asset preservation and protection, comprehensive approach, and respect for each jurisdiction."
    - Committee members also expressed a desire to incorporate networking and resources sharing
- Further discussion about the definition of risk being where natural hazards and community assets (people and the built environment) intersect.
    - Another hazard identification/initial profile exercise was introduced to address additional hazards (non-natural hazards)
    - Hazards included: animal disease, hazardous materials, transportation, fire/explosion, civil disturbance, terrorism, health emergencies, nuclear/radiation, and energy shortage (refined and added cyberterrorism later on)
    - Discussion of damage and dollar amounts: scale should be adjusted up to $10 million as damage from events can/have surpassed $1 million



- Three small groups ranked and discussed the above hazards. Widely differing rankings and views were presented
- Terrorism elicited particular discussion. Some saw less risk. Others noted that high-value targets (such as water supply facilities and systems) should be better protected

- Goals from the 2008 plan were then discussed and rated by each participant. Participants voted with red, green, and yellow dots. Red dots suggested removal; yellow dots suggested uncertainty, and green dots suggested OK/appropriate to leave in the updated plan.



- Goals discussed included:
  - Help people protect themselves (#1)

        - Preserve open space (#2)
        - Prevent development from increasing vulnerability (#3)
        - Promote partnerships (#4)
        - Protect critical facilities (#5)
        - Protect human and environmental health (#6)
        - Protect human lives, today and tomorrow (#7)
    - Participants were most hesitant to re-include goals related to land-use controls to protect new development from vulnerability
    - Many felt that #7 was closely related to #6 and that the two should be merged
    - A list was included in handouts to prompt comments on additional/revised goals for the plan update that would be compared to the input of local jurisdictions
- Homework for the next meeting included a worksheet to review 2008 mitigation actions to determine which actions/projects/programs were completed (or ongoing) between plans.

Minutes and Notes from December 29, 2015

- Introductions made by those present.
- Neighboring jurisdictions were present at the meeting, including Winnebago County and Carroll County EMA chiefs. They were invited to participate and share insights from their recent planning processes. Carroll County's Greg Miller complemented the large amount of participation and noted that in his smaller county (population-wise), securing participation was difficult. Miller also noted that education and outreach were very important areas to follow through on. Winnebago County's Bud Turner reported that he was not on staff during their update several years ago, but spoke of flood mitigation projects and the MD-1 program, where trained physicians work as first responders.
- Discussed results of survey and notable comments/insights provided by induvial residents and workers in some way connected to Stephenson County.
- Finished/remarked on hazard rankings discussion. Committee members ranked severe thunderstorm related events, such as tornadoes, winds, and hail as the highest severity, while acknowledging concerns with flooding and flash flooding. Cyber-terrorism and Internet ransomware were noted as risks; natural hazard focus was stressed for this process.
- Continuity of government and continuity of operations planning is noted (especially for businesses due to lack of planning; SCEMA Director Robert Baker is now surveying businesses).
- Began discussion of risk assessment; noted community meetings and progress (and need to extend community meetings into 2016 to accommodate community schedules/availability of officials).
- Goal setting: goals and objectives discussed and agreed upon. Discussion included making information on sharing resources more available. Mutual aid agreements were encouraged to be formalized and made "on-paper".
- Discussed actions (projects and programs) by community. Began to address vulnerability (before and after) and the benefits and costs associated with each action. The larger discussion group was broken up into smaller working groups.

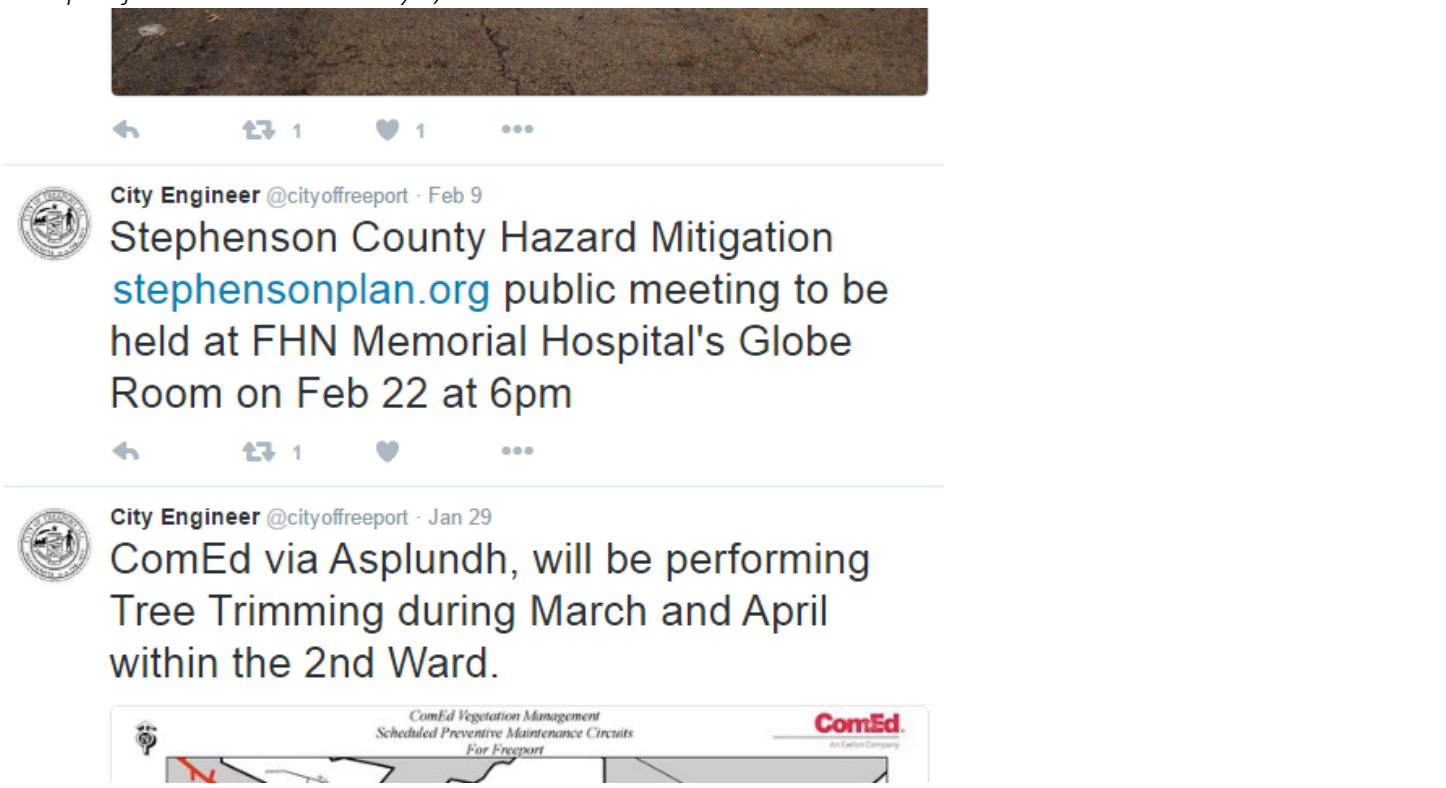
Minutes and Notes from February 22, 2016

- Introductions made at final planning committee meeting. Several members of the public observing and participating.
- Wall maps of flooding and other risks and vulnerabilities were presented by GIS Mapping Specialist Andy Shaw. Review of critical facilities/other buildings inventory took place. Benefit-cost analysis (BCA) for action items was completed by jurisdictions present.
- Adoption template was shared and discussed.
- Discussed release of draft plan update: first to lead agencies for review, followed by the planning committee and immediate stakeholders. Next, plan will be distributed for public comment. Public meetings/presentation sessions on the draft plan will be held (tentatively) at Freeport's library and Lena's village hall; dates to be determined (confirmed via email), pending collection of outstanding desirable documents/information.
- Discussion and approval of action plan, including maintenance responsibilities and public participation component going forward.

Social Media

Example of Facebook Post – December 17, 2015

Example of Twitter Post – February 9, 2016



Media Coverage

- Freeport hires regional council to update hazard plan, Journal Standard, August 21, 2015
- Multi-Hazard Mitigation Planning Committee to meet, Journal Standard, September 15, 2015
- Radio interview, Big Radio, September 21, 2015
- Stephenson County Committee Asks Individuals To Complete Short 12 Question Survey, Freeport News Network, December 11, 2015
- Countywide Hazard Mitigation Survey available through Dec. 18, Journal Standard, December 11, 2015
- Stephenson County Multi-Hazard Mitigation Survey, WIFR, December 11, 2015
- Hazard Mitigation Committee to Meet February 22, 2016, Freeport News Network, February 12, 2016
- Hazard Mitigation Committee to Meet February 22, Journal-Standard, February 18, 2016

Hazard Mitigation Committee to Meet February 22

Final meeting to discuss hazard mitigation actions and implementation

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- Radio interview, Big Radio, April 25, 2016

Appendix D: Previous/Historical Hazard Events

DROUGHT

Table X: Stephenson County Drought 1996-2015 [79]

NWS ID	Location	Begin Date	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5462675	Stephenson (zone)	6/15/2005	0	0	0.00k	0.00k
5466138	Stephenson (zone)	7/1/2005	0	0	0.00k	17,810.00k
5472309	Stephenson (zone)	8/1/2005	0	0	0.00k	3,250.00k
5478985	Stephenson (zone)	9/1/2005	0	0	0.00k	0.00k
5479149	Stephenson (zone)	10/1/2005	0	0	0.00k	0.00k
5480836	Stephenson (zone)	11/1/2005	0	0	0.00k	0.00k
5485018	Stephenson (zone)	12/1/2005	0	0	0.00k	0.00k
5486188	Stephenson (zone)	1/1/2006	0	0	0.00k	0.00k
5492244	Stephenson (zone)	2/1/2006	0	0	0.00k	0.00k
5497692	Stephenson (zone)	3/1/2006	0	0	0.00k	0.00k
399828	Stephenson (zone)	7/10/2012	0	0	0.00k	0.00k
410416	Stephenson (zone)	8/7/2012	0	0	0.00k	0.00k
418975	Stephenson (zone)	11/1/2012	0	0	0.00k	0.00k

[79] "Storm Events Database," National Climatic Data Center (NCDC), NOAA, last accessed January 22, 2016

EARTHQUAKES

Table X: Earthquakes Felt or Occurring in Stephenson County, 1638-1999[80]

Date	Focal Depth (km)	Magnitude	Epicentral Distance (km)
1907*	n/a	3.2	n/a
5/26/1909	n/a	n/a	55
1/2/1912	n/a	n/a	n/a
11/1/1935	n/a	n/a	972
11/9/1968	n/a	5.3	487
9/15/1972	5	3.7	80
4/3/1974	11	4.7	432
9/2/1999**	n/a	3.5	n/a

*Note: data does not include all earthquakes impacting or felt in Stephenson County. * = The 1907 earthquake occurred near Pearl City in Stephenson County; not included in NOAA's NCEI dataset. ** = from "The Earthquake of September 2, 1999, in Northern Illinois: Big Lessons from a Small Earthquake"; not included in NOAA's NCEI dataset.*

[80] "U.S. Earthquake Intensity Database, 1638-1985," NCEI, NOAA, last accessed December 3, 2015

EXTREME TEMPERATURES

Table X: Stephenson County Extreme Temperatures 1996-2015[81]

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5178342	Stephenson (zone)	12/16/2000	14:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
5177543	Stephenson (zone)	12/21/2000	4:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
5177886	Stephenson (zone)	12/23/2000	22:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
14481	Stephenson (zone)	2/2/2007	4:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
76786	Stephenson (zone)	1/24/2008	5:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
77203	Stephenson (zone)	1/29/2008	22:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
84143	Stephenson (zone)	2/10/2008	2:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
151125	Stephenson (zone)	1/14/2009	22:00	Extreme Cold/Wind Chill	0	0	0.00k	0.00k
399716	Stephenson (zone)	7/4/2012	12:00	Excessive Heat	0	0	0.00k	0.00k
496374	Stephenson (zone)	1/5/2014	6:00	Extreme Cold/wind Chill	0	0	0.00k	0.00k
497797	Stephenson (zone)	1/22/2014	18:00	Extreme Cold/wind Chill	0	0	0.00k	0.00k

[81] "Storm Events Database," NCDC, NOAA, last accessed January 22, 2016

Table X: Pecatonica River Crest Chronology (action/flood stage of 11.5 feet or more) – Measured at Freeport Streamgage[82]

Rank	Height (ft)	Date
4	18.45	9/16/1914
36	15.7	2/16/1915
8	17.27	2/27/1915
151	12.5	6/13/1915
142	12.8	8/3/1915
27	16.2	9/17/1915
34	15.8	9/28/1915
11	17	1/28/1916
69	14.3	2/24/1916
2	19.4	3/28/1916
123	13.1	6/9/1916
30	16.09	3/16/1917
84	14	6/14/1917
19	16.38	2/15/1918
29	16.1	3/2/1918
31	16	3/14/1918
6	17.6	3/16/1919
107	13.4	5/4/1919
122	13.2	9/24/1919
113	13.3	10/2/1919
83	14	10/6/1919
79	14.1	10/31/1919
135	12.9	11/11/1919
41	15.48	3/16/1920
49	14.8	3/27/1920
128	13	4/22/1920
159	12.06	8/20/1921
3	18.82	2/25/1922
53	14.7	3/9/1922
133	12.9	3/22/1922
68	14.3	4/11/1922
85	14	2/28/1923
39	15.6	3/5/1923
5	18.36	4/6/1923
132	12.9	3/7/1924
93	13.9	3/30/1924
92	13.9	6/26/1924
144	12.7	8/6/1924
48	14.88	8/23/1924
104	13.5	2/11/1925
71	14.28	2/24/1925
140	12.8	3/21/1925
134	12.9	6/27/1925
112	13.3	3/2/1926
121	13.2	3/21/1926
67	14.3	4/10/1926
45	15.09	6/14/1926
63	14.4	10/3/1926

[82] "Pecatonica River at Freeport," Advanced Hydrologic Prediction Service, National Weather Service, last accessed January 19, 2016

Rank	Height (ft)	Date
47	14.9	2/5/1927
15	16.74	2/9/1927
146	12.7	3/13/1927
127	13	5/12/1927
62	14.4	5/29/1927
111	13.3	9/14/1927
141	12.8	9/20/1927
38	15.6	10/8/1927
60	14.5	12/30/1927
23	16.3	2/12/1928
14	16.77	3/16/1928
139	12.8	4/7/1928
51	14.8	8/28/1928
50	14.8	11/19/1928
108	13.4	12/16/1928
1	19.76	3/16/1929
90	13.9	4/11/1929
145	12.7	4/20/1929
25	16.28	2/24/1930
153	12.4	6/16/1930
101	13.6	11/21/1931
97	13.8	11/25/1931
24	16.28	3/29/1932
78	14.1	6/10/1932
66	14.3	12/29/1932
7	17.41	4/3/1933
105	13.5	5/3/1933
120	13.2	5/9/1933
43	15.3	5/23/1933
40	15.5	7/6/1933
161	12	1/14/1934
103	13.5	11/23/1934
89	13.9	12/1/1934
152	12.49	3/9/1935
91	13.9	12/1/1935
162	11.99	3/16/1936
33	15.8	2/24/1937
12	16.98	3/8/1937
169	11.5	6/23/1937
114	13.3	1/26/1938
22	16.33	2/9/1938
65	14.3	9/19/1938
136	12.85	3/25/1941
98	13.76	8/3/1942
164	11.8	2/22/1943
75	14.13	3/16/1943
166	11.6	8/15/1943
99	13.75	2/27/1944
110	13.3	3/15/1944
158	12.1	6/26/1944
147	12.67	6/29/1945
42	15.46	1/9/1946
160	12	3/10/1946
106	13.4	3/17/1946
154	12.3	6/18/1947

Rank	Height (ft)	Date
17	16.41	3/1/1948
32	15.8	3/20/1948
163	11.9	5/13/1948
156	12.2	3/1/1949
55	14.65	3/9/1949
138	12.8	1/27/1950
131	12.9	3/28/1950
59	14.51	7/22/1950
57	14.59	7/12/1951
76	14.13	3/14/1952
46	15.04	2/24/1953
119	13.23	2/21/1955
155	12.21	3/1/1958
13	16.9	4/5/1959
20	16.35	4/2/1960
130	12.94	3/30/1961
102	13.55	3/30/1962
54	14.68	3/21/1963
73	14.25	3/6/1965
74	14.23	2/14/1966
115	13.29	3/29/1967
9	17.16	7/3/1969
21	16.33	2/20/1971
109	13.38	9/15/1972
61	14.41	12/31/1972
72	14.25	1/31/1974
95	13.89	3/8/1974
10	17.13	3/25/1975
148	12.6	3/9/1976
143	12.73	6/23/1978
81	14.06	3/24/1979
77	14.11	3/20/1980
157	12.18	3/20/1980
137	12.84	9/8/1981
56	14.63	3/20/1982
150	12.53	12/7/1982
37	15.64	2/27/1985
118	13.25	3/25/1986
168	11.54	2/2/1988
124	13.08	3/16/1989
26	16.24	7/4/1990
149	12.54	3/6/1991
16	16.61	7/11/1993
165	11.73	5/12/1995
58	14.56	7/19/1996
18	16.4	2/22/1997
125	13.04	4/6/1998
87	13.96	5/22/1999
44	15.27	6/5/2000
167	11.57	2/11/2001
86	13.97	8/23/2002
80	14.08	5/29/2004
64	14.34	2/15/2005
100	13.63	8/31/2007
117	13.25	3/21/2008

Rank	Height (ft)	Date
82	14.03	4/13/2008
126	13.02	4/22/2008
70	14.28	5/1/2008
35	15.71	6/15/2008
94	13.9	3/13/2009
116	13.28	3/18/2010
28	16.12	7/24/2010
129	12.97	7/29/2011
52	14.71	3/15/2013
96	13.82	4/19/2013
88	13.93	6/30/2013

Table X: Stephenson County Flooding (including Flash Flooding) 1996-2015[83]

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5589275	Countywide	2/20/1997	16:00	Flash Flood	0	0	0.00k	0.00k
5716464	Freeport	6/6/1999	14:30	Flood	0	0	0.00k	0.00k
5718357	Countywide	7/23/1999	16:00	Flood	0	0	0.00k	0.00k
5145912	Freeport	5/11/2000	8:45	Flood	0	0	0.00k	0.00k
5153562	Freeport	6/13/2000	5:25	Flood	0	0	0.00k	0.00k
5268906	Freeport	9/20/2001	21:10	Flood	0	0	0.00k	0.00k
5300339	Freeport	6/3/2002	18:10	Flood	0	0	0.00k	0.00k
5300343	Freeport	6/4/2002	0:30	Flood	0	0	0.00k	0.00k
5300344	Pearl City	6/4/2002	2:00	Flash Flood	0	0	0.00k	0.00k
5300349	Freeport	6/4/2002	8:45	Flash Flood	0	0	0.00k	0.00k
5300355	Pearl City	6/4/2002	14:00	Flash Flood	0	0	0.00k	0.00k
5312854	Freeport	8/22/2002	1:45	Flash Flood	0	0	0.00k	0.00k
5312853	Eleroy	8/22/2002	1:45	Flash Flood	0	0	0.00k	0.00k
5312855	Lena	8/22/2002	1:50	Flash Flood	0	0	0.00k	0.00k
5404853	Stephenson (zone)	5/26/2004	20:00	Flood	0	0	0.00k	0.00k
5416384	Stephenson (zone)	6/1/2004	0:00	Flood	0	0	0.00k	0.00k
5418453	Cedarville	6/16/2004	16:00	Flash Flood	0	0	20.00k	3.00k
5418456	Lena	6/16/2004	18:20	Flash Flood	0	0	10.00k	3.00k
5418457	Lena	6/16/2004	18:20	Flash Flood	0	0	10.00k	3.00k
5418460	Lena	6/16/2004	19:30	Flash Flood	0	0	10.00k	3.00k
5439222	Stephenson (zone)	2/14/2005	14:45	Flood	0	0	5.00k	0.00k
57936	Lena	8/7/2007	1:00	Flash Flood	0	0	10.00k	0.00k
97290	Freeport	4/1/2008	0:00	Flood	0	0	0.00k	0.00k
170060	Scioto Mills	5/13/2009	20:00	Flash Flood	0	0	0.00k	0.00k
191653	Freeport	7/27/2009	20:20	Flash Flood	0	0	5.00k	0.00k
233020	Waddams Grove	5/26/2010	19:40	Flash Flood	0	0	0.00k	0.00k
250560	Waddams Grove	7/22/2010	23:48	Flash Flood	0	0	1,000.00k	0.00k
251723	Winslow	7/24/2010	2:00	Flood	0	0	500k	0.00k
250778	Winneshiek	7/24/2010	3:00	Flash Flood	0	0	500k	0.00k
339647	German Valley	8/12/2011	16:39	Flash Flood	0	0	0.00k	0.00k
525972	Freeport	6/30/2014	19:22	Flash Flood	0	0	0.00k	0.00k
525976	Bolton	6/30/2014	19:32	Flash Flood	0	0	0.00k	0.00k
576985	Waddams Grove	6/11/2015	23:45	Flash Flood	0	0	0.00k	0.00k

Note: click on location to learn more about a hazard event and episode.

[83] "Storm Events Database," NCDC, NOAA, last accessed January 19, 2016

SEVERE THUNDERSTORMS

Table X: Stephenson County (including Thunderstorm Wind, Strong Wind, and High Wind) 1955-2015[84]

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
10007493	Stephenson County	5/9/1956	17:30	Thunderstorm Wind	0	0	0.00k	0.00k
10011131	Stephenson County	7/29/1967	17:15	Thunderstorm Wind	0	0	0.00k	0.00k
10007788	Stephenson County	8/6/1968	22:27	Thunderstorm Wind	0	0	0.00k	0.00k
10007790	Stephenson County	8/16/1968	14:40	Thunderstorm Wind	0	0	0.00k	0.00k
10011217	Stephenson County	6/6/1971	4:45	Thunderstorm Wind	0	0	0.00k	0.00k
10011223	Stephenson County	6/19/1971	22:19	Thunderstorm Wind	0	0	0.00k	0.00k
10011225	Stephenson County	6/24/1971	20:30	Thunderstorm Wind	0	0	0.00k	0.00k
10006766	Stephenson County	6/12/1972	20:20	Thunderstorm Wind	0	0	0.00k	0.00k
10006807	Stephenson County	9/28/1972	16:40	Thunderstorm Wind	0	0	0.00k	0.00k
10010193	Stephenson County	6/8/1974	20:30	Thunderstorm Wind	0	0	0.00k	0.00k
10006851	Stephenson County	6/14/1974	18:45	Thunderstorm Wind	0	0	0.00k	0.00k
10006852	Stephenson County	6/14/1974	19:00	Thunderstorm Wind	0	0	0.00k	0.00k
10006887	Stephenson County	6/20/1974	17:15	Thunderstorm Wind	0	0	0.00k	0.00k
10006892	Stephenson County	6/20/1974	17:25	Thunderstorm Wind	0	0	0.00k	0.00k
10009120	Stephenson County	6/22/1974	8:40	Thunderstorm Wind	0	0	0.00k	0.00k
10009121	Stephenson County	6/22/1974	9:15	Thunderstorm Wind	0	0	0.00k	0.00k
10009204	Stephenson County	11/29/1975	21:20	Thunderstorm Wind	0	0	0.00k	0.00k
10009205	Stephenson County	11/29/1975	21:30	Thunderstorm Wind	0	0	0.00k	0.00k
10003296	Stephenson County	6/30/1978	18:00	Thunderstorm Wind	0	0	0.00k	0.00k
10006392	Stephenson County	6/14/1980	2:00	Thunderstorm Wind	0	0	0.00k	0.00k
10003074	Stephenson County	7/16/1980	2:00	Thunderstorm Wind	0	0	0.00k	0.00k
10004163	Stephenson County	8/4/1980	17:55	Thunderstorm Wind	0	0	0.00k	0.00k
10003411	Stephenson County	7/13/1981	8:55	Thunderstorm Wind	0	0	0.00k	0.00k
10004517	Stephenson County	9/30/1981	18:35	Thunderstorm Wind	0	0	0.00k	0.00k
10002369	Stephenson County	7/6/1982	14:00	Thunderstorm Wind	0	0	0.00k	0.00k
10004614	Stephenson County	7/1/1983	7:00	Thunderstorm Wind	0	0	0.00k	0.00k
10004104	Stephenson County	4/29/1984	21:10	Thunderstorm Wind	0	0	0.00k	0.00k
10005494	Stephenson County	7/10/1984	18:45	Thunderstorm Wind	0	0	0.00k	0.00k
10003368	Stephenson County	8/12/1985	21:45	Thunderstorm Wind	0	0	0.00k	0.00k
10002584	Stephenson County	9/28/1986	16:10	Thunderstorm Wind	0	0	0.00k	0.00k
10004788	Stephenson County	5/27/1987	18:30	Thunderstorm Wind	0	0	0.00k	0.00k
10004789	Stephenson County	5/27/1987	19:55	Thunderstorm Wind	0	0	0.00k	0.00k
10004854	Stephenson County	7/6/1987	13:30	Thunderstorm Wind	0	0	0.00k	0.00k
10005981	Stephenson County	8/16/1987	17:05	Thunderstorm Wind	0	1	0.00k	0.00k
10002646	Stephenson County	5/8/1988	15:45	Thunderstorm Wind	0	0	0.00k	0.00k
10003766	Stephenson County	8/8/1988	18:30	Thunderstorm Wind	0	0	0.00k	0.00k
10005269	Stephenson County	4/27/1990	16:05	Thunderstorm Wind	0	0	0.00k	0.00k
10005271	Stephenson County	4/27/1990	16:13	Thunderstorm Wind	0	0	0.00k	0.00k
10002480	Stephenson County	6/29/1990	0:15	Thunderstorm Wind	0	0	0.00k	0.00k
10002489	Stephenson County	6/29/1990	1:25	Thunderstorm Wind	0	0	0.00k	0.00k
10002515	Stephenson County	8/19/1990	16:05	Thunderstorm Wind	0	0	0.00k	0.00k
10006228	Stephenson County	7/2/1992	11:20	Thunderstorm Wind	0	0	0.00k	0.00k
10322732	Freeport	4/18/1995	9:45	Thunderstorm Wind	0	0	0.00k	0.00k
10322733	Freeport	4/18/1995	9:48	Thunderstorm Wind	0	0	0.00k	0.00k
5560275	Pearl City	4/19/1996	20:10	Thunderstorm Wind	0	0	1,200.00k	0.00k
5560274	Freeport	4/19/1996	20:15	Thunderstorm Wind	0	0	0.00k	0.00k

[84] "Storm Events Database," NCDC, NOAA, last accessed January 19, 2016

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5570058	Stephenson County (zone)	10/29/1996	17:10	High Wind	0	0	0.00k	0.00k
5592059	Freeport	4/5/1997	16:36	Thunderstorm Wind	0	0	0.00k	0.00k
5592195	Lena	4/5/1997	16:36	Thunderstorm Wind	0	0	0.00k	0.00k
5592047	Stephenson County (zone)	4/6/1997	8:00	High Wind	0	0	100.00k	0.00k
5597975	Stephenson County (zone)	5/7/1997	22:30	High Wind	0	0	0.00k	0.00k
5604056	Pearl City	6/21/1997	5:25	Thunderstorm Wind	0	0	0.00k	0.00k
5623996	Stephenson County	9/16/1997	19:50	Thunderstorm Wind	0	0	0.00k	0.00k
5624099	Stephenson County (zone)	9/29/1997	11:00	High Wind	0	0	0.00k	0.00k
5666340	Freeport	6/18/1998	14:15	Thunderstorm Wind	0	0	1.00k	0.00k
5666481	Pearl City	6/28/1998	1:35	Thunderstorm Wind	0	0	1.00k	0.00k
5666536	Freeport	7/3/1998	18:10	Thunderstorm Wind	0	0	0.00k	0.00k
5664751	Pearl City	8/24/1998	11:18	Thunderstorm Wind	0	0	0.00k	0.00k
5664752	Freeport	8/24/1998	11:30	Thunderstorm Wind	0	0	0.00k	0.00k
5664753	German Valley	8/24/1998	11:45	Thunderstorm Wind	0	0	0.00k	0.00k
5673098	Stephenson County (zone)	11/9/1998	4:00	High Wind	0	0	0.00k	0.00k
5684973	Dakota	2/11/1999	13:46	Thunderstorm Wind	0	0	0.00k	0.00k
5710051	Freeport	5/16/1999	23:05	Thunderstorm Wind	0	0	8.00k	0.00k
5710053	Orangeville	5/16/1999	23:25	Thunderstorm Wind	0	1	40.00k	0.00k
5715221	Freeport	5/16/1999	23:30	Thunderstorm Wind	0	0	15.00k	0.00k
5716463	Freeport	6/6/1999	14:10	Thunderstorm Wind	0	0	5.00k	0.00k
5716456	Freeport	6/6/1999	15:22	Thunderstorm Wind	0	0	0.00k	0.00k
5153557	Freeport	6/1/2000	18:30	Thunderstorm Wind	0	0	2.00k	0.00k
5153558	Rock City	6/1/2000	18:50	Thunderstorm Wind	0	0	1.00k	0.00k
5157913	Freeport	9/11/2000	19:20	Thunderstorm Wind	0	0	0.00k	0.00k
5157914	Lena	9/11/2000	20:16	Thunderstorm Wind	0	0	0.00k	0.00k
5232019	Stephenson (zone)	2/25/2001	2:00	High Wind	0	0	0.00k	0.00k
5243568	Stephenson (zone)	4/23/2001	10:00	Strong Wind	0	0	0.00k	0.00k
5255461	Freeport	6/14/2001	17:35	Thunderstorm Wind	0	0	0.00k	0.00k
5255468	Pearl City	6/14/2001	18:20	Thunderstorm Wind	0	0	0.00k	0.00k
5255467	Pearl City	6/14/2001	18:20	Thunderstorm Wind	0	0	0.00k	0.00k
5255469	Freeport	6/14/2001	18:45	Thunderstorm Wind	0	0	0.00k	0.00k
5268896	Lena	9/7/2001	18:00	Thunderstorm Wind	0	0	0.00k	0.00k
5268897	Orangeville	9/7/2001	18:10	Thunderstorm Wind	0	0	0.00k	0.00k
5284390	Stephenson (zone)	3/9/2002	16:00	High Wind	0	0	0.00k	0.00k
5297778	Lena	5/30/2002	19:40	Thunderstorm Wind	0	0	0.00k	0.00k
5300815	Freeport	6/10/2002	17:05	Thunderstorm Wind	0	0	0.00k	0.00k
5300817	Lena	6/10/2002	17:12	Thunderstorm Wind	0	0	0.00k	0.00k
5300816	Freeport	6/10/2002	17:30	Thunderstorm Wind	0	0	0.00k	0.00k
5312751	Freeport	8/12/2002	19:15	Thunderstorm Wind	0	0	0.00k	0.00k
5349021	Stephenson (zone)	2/11/2003	16:45	High Wind	0	0	0.00k	0.00k
5359107	Stephenson (zone)	5/4/2003	19:30	High Wind	0	0	1,000.00k	0.00k
5359316	Stephenson (zone)	5/9/2003	23:40	High Wind	0	0	2,000.00k	0.00k
5377270	Stephenson County	7/5/2003	2:35	Thunderstorm Wind	0	0	2,500.00k	50.00k
5377272	Freeport	7/5/2003	2:43	Thunderstorm Wind	0	0	150.00k	15.00k
5377274	Pearl City	7/5/2003	2:50	Thunderstorm Wind	0	1	20.00k	10.00k
5377275	Freeport	7/5/2003	2:53	Thunderstorm Wind	0	0	50.00k	0.00k
5329187	Stephenson (zone)	11/12/2003	14:30	High Wind	0	0	20.00k	0.00k
5394559	Winslow	4/17/2004	0:33	Thunderstorm Wind	0	0	10.00k	0.00k
5418398	Cedarville	6/16/2004	15:51	Thunderstorm Wind	0	0	1.00k	0.00k

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5426433	Lena	10/29/2004	21:46	Thunderstorm Wind	0	0	3.00k	0.00k
5426434	Freeport	10/29/2004	22:02	Thunderstorm Wind	0	0	3.00k	0.00k
5462303	Lena	6/25/2005	18:35	Thunderstorm Wind	0	0	8.00k	4.00k
5462304	McConnell	6/25/2005	18:56	Thunderstorm Wind	0	0	5.00k	0.00k
5462305	Orangeville	6/25/2005	19:05	Thunderstorm Wind	0	0	5.00k	0.00k
5472431	Orangeville	8/18/2005	7:29	Thunderstorm Wind	0	0	5.00k	0.00k
5478882	Freeport	9/13/2005	16:15	Thunderstorm Wind	0	0	20.00k	0.00k
5498165	German Valley	3/12/2006	22:12	Thunderstorm Wind	0	0	2.00k	0.00k
5512735	Freeport	5/29/2006	12:30	Thunderstorm Wind	0	0	0.00k	0.00k
5518789	Freeport	6/21/2006	3:50	Thunderstorm Wind	0	0	2.00k	0.00k
5518791	McConnell	6/21/2006	4:40	Thunderstorm Wind	0	0	1.00k	0.00k
5518794	Davis	6/21/2006	5:58	Thunderstorm Wind	0	0	1.00k	0.00k
5518834	Pearl City	6/21/2006	5:58	Thunderstorm Wind	0	0	0.00k	0.00k
5526396	Loran	7/17/2006	19:58	Thunderstorm Wind	0	0	0.00k	4.00k
5526488	Freeport	7/17/2006	20:15	Thunderstorm Wind	0	0	5.00k	0.00k
5526487	Bolton	7/17/2006	20:21	Thunderstorm Wind	0	0	0.00k	4.00k
5526602	Freeport	7/20/2006	2:30	Thunderstorm Wind	0	0	5.00k	0.00k
5527453	Rock City	7/22/2006	16:38	Thunderstorm Wind	0	0	1.00k	0.00k
56826	Rock Grove	8/12/2007	0:55	Thunderstorm Wind	0	0	0.00k	0.00k
56827	Freeport	8/12/2007	0:55	Thunderstorm Wind	0	0	0.00k	0.00k
56829	Lena	8/12/2007	1:00	Thunderstorm Wind	0	0	0.00k	0.00k
56915	Oneco	8/14/2007	3:00	Thunderstorm Wind	0	0	0.00k	0.00k
115528	Freeport	6/8/2008	9:12	Thunderstorm Wind	0	0	0.00k	0.00k
115538	Winslow	6/8/2008	9:15	Thunderstorm Wind	0	0	15.00k	0.00k
115546	Freeport	6/8/2008	9:20	Thunderstorm Wind	0	0	15.00k	0.00k
115543	Freeport	6/8/2008	9:20	Thunderstorm Wind	0	0	15.00k	0.00k
115555	Winneshiek	6/8/2008	9:30	Thunderstorm Wind	0	0	15.00k	0.00k
115661	Waddams Grove	6/8/2008	19:35	Thunderstorm Wind	0	0	0.00k	0.00k
115647	Waddams Grove	6/8/2008	19:35	Thunderstorm Wind	0	0	0.00k	0.00k
117266	Freeport	6/12/2008	14:10	Thunderstorm Wind	0	0	25.00k	0.00k
117262	Freeport	6/12/2008	14:15	Thunderstorm Wind	0	0	0.00k	0.00k
117299	Pearl City	6/12/2008	21:50	Thunderstorm Wind	0	0	5.00k	0.00k
117328	Pearl City	6/12/2008	21:50	Thunderstorm Wind	0	0	0.00k	0.00k
117342	Pearl City	6/12/2008	21:58	Thunderstorm Wind	0	0	0.00k	0.00k
114910	Lena	6/28/2008	13:02	Thunderstorm Wind	0	0	0.00k	0.00k
117031	Bolton	6/28/2008	13:07	Thunderstorm Wind	0	0	5.00k	0.00k
117038	Pearl City	6/28/2008	13:15	Thunderstorm Wind	0	0	5.00k	0.00k
117041	Dakota Dornink Airport	6/28/2008	13:15	Thunderstorm Wind	0	0	2.00k	0.00k
117040	Freeport	6/28/2008	13:15	Thunderstorm Wind	0	0	5.00k	0.00k
129438	Lena	7/7/2008	20:30	Thunderstorm Wind	0	0	50.00k	0.00k
123713	Kent	7/31/2008	11:29	Thunderstorm Wind	0	0	0.00k	0.00k
123715	Winslow	7/31/2008	11:35	Thunderstorm Wind	0	1	25.00k	0.00k
130366	Freeport	8/4/2008	5:30	Thunderstorm Wind	0	0	5.00k	0.00k
130400	Lena	8/4/2008	17:20	Thunderstorm Wind	0	0	0.00k	0.00k
130404	Bolton	8/4/2008	17:25	Thunderstorm Wind	0	0	0.00k	0.00k
130412	Freeport	8/4/2008	17:28	Thunderstorm Wind	0	0	0.00k	0.00k
130411	Pearl City	8/4/2008	17:28	Thunderstorm Wind	0	0	5.00k	0.00k
130407	Scioto Mills	8/4/2008	17:28	Thunderstorm Wind	0	0	5.00k	0.00k
130421	Freeport	8/4/2008	17:30	Thunderstorm Wind	0	0	250.00k	0.00k
130416	German Valley	8/4/2008	17:30	Thunderstorm Wind	0	0	0.00k	0.00k
130436	German Valley	8/4/2008	17:50	Thunderstorm Wind	0	0	0.00k	0.00k
130429	German Valley	8/4/2008	17:50	Thunderstorm Wind	0	0	2.00k	0.00k
134800	Stephenson (zone)	10/26/2008	12:00	High Wind	0	0	0.00k	0.00k

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
133150	Stephenson (zone)	10/26/2008	14:00	High Wind	0	0	0.00k	0.00k
133149	Stephenson (zone)	10/26/2008	14:56	High Wind	0	0	0.00k	0.00k
174034	Buena Vista	6/1/2009	15:30	Thunderstorm Wind	0	0	100.00k	0.00k
174005	Buena Vista	6/1/2009	15:30	Thunderstorm Wind	0	0	15.00k	0.00k
183851	Freeport	6/19/2009	8:45	Thunderstorm Wind	0	0	0.00k	0.00k
183848	Freeport	6/19/2009	8:45	Thunderstorm Wind	0	0	0.00k	0.00k
184160	Oneco	6/25/2009	15:02	Thunderstorm Wind	0	0	0.00k	0.00k
184166	Oneco	6/25/2009	15:02	Thunderstorm Wind	0	0	0.00k	0.00k
191312	Pearl City	7/24/2009	17:33	Thunderstorm Wind	0	0	5.00k	0.00k
191316	Bolton	7/24/2009	17:51	Thunderstorm Wind	0	0	0.00k	0.00k
191648	Freeport Albertus Airport	7/27/2009	20:20	Thunderstorm Wind	0	0	0.00k	0.00k
189291	Freeport	7/27/2009	20:20	Thunderstorm Wind	0	0	0.00k	0.00k
219033	Freeport	4/5/2010	22:55	Thunderstorm Wind	0	0	100.00k	0.00k
244775	Kent	6/18/2010	13:10	Thunderstorm Wind	0	0	0.00k	0.00k
244782	Pearl City	6/18/2010	13:30	Thunderstorm Wind	0	0	10.00k	0.00k
244787	Freeport	6/18/2010	13:55	Thunderstorm Wind	0	0	10.00k	0.00k
248560	Afolkey	7/22/2010	20:28	Thunderstorm Wind	0	0	0.00k	0.00k
248563	Rock City	7/22/2010	20:33	Thunderstorm Wind	0	0	0.00k	0.00k
257147	Freeport	8/20/2010	13:55	Thunderstorm Wind	0	0	50.00k	0.00k
257150	Damascus	8/20/2010	13:58	Thunderstorm Wind	0	0	0.00k	0.00k
315098	Freeport	5/22/2011	17:32	Thunderstorm Wind	0	0	0.00k	0.00k
315100	Freeport Albertus Airport	5/22/2011	17:35	Thunderstorm Wind	0	0	0.00k	0.00k
315101	German Valley	5/22/2011	17:36	Thunderstorm Wind	0	0	0.00k	0.00k
315113	Ridott	5/22/2011	17:40	Thunderstorm Wind	0	0	25.00k	0.00k
323607	Waddams Grove	6/8/2011	20:31	Thunderstorm Wind	0	0	0.00k	0.00k
323609	Lena	6/8/2011	20:32	Thunderstorm Wind	0	0	0.00k	0.00k
323610	Lena	6/8/2011	20:32	Thunderstorm Wind	0	0	0.00k	0.00k
323611	Rock City	6/8/2011	20:54	Thunderstorm Wind	0	0	5.00k	0.00k
338629	Freeport	7/11/2011	8:00	Thunderstorm Wind	0	0	0.00k	0.00k
331096	Freeport	7/24/2011	6:36	Thunderstorm Wind	0	0	0.00k	0.00k
339655	Freeport Albertus Airport	8/12/2011	16:15	Thunderstorm Wind	0	0	0.00k	0.00k
339654	German Valley	8/12/2011	16:50	Thunderstorm Wind	0	0	0.00k	0.00k
339898	Stephenson County (zone)	9/29/2011	14:59	Strong Wind	0	0	1.00k	0.00k
390946	Lake Summerset	7/18/2012	18:47	Thunderstorm Wind	0	0	0.00k	0.00k
390960	Waddams Grove	7/24/2012	3:40	Thunderstorm Wind	0	0	0.00k	0.00k
390962	Freeport	7/24/2012	3:45	Thunderstorm Wind	0	0	0.00k	0.00k
390971	Freeport Albertus Airport	7/24/2012	3:55	Thunderstorm Wind	0	0	0.00k	0.00k
390972	Freeport	7/24/2012	3:56	Thunderstorm Wind	0	0	0.00k	0.00k
390967	Freeport	7/24/2012	4:01	Thunderstorm Wind	0	0	0.00k	0.00k
410198	Lena	8/4/2012	13:25	Thunderstorm Wind	0	0	0.00k	0.00k
410201	Freeport	8/4/2012	13:49	Thunderstorm Wind	0	0	0.00k	0.00k
410200	Freeport	8/4/2012	13:57	Thunderstorm Wind	0	0	0.00k	0.00k
454701	Freeport	5/19/2013	19:45	Thunderstorm Wind	0	0	0.00k	0.00k
454681	Freeport	5/30/2013	17:17	Thunderstorm Wind	0	0	0.00k	0.00k
454685	Freeport	5/30/2013	17:17	Thunderstorm Wind	0	0	0.00k	0.00k
454683	Winneshiek	5/30/2013	17:30	Thunderstorm Wind	0	0	0.00k	0.00k
514200	Freeport	4/12/2014	8:25	Thunderstorm Wind	0	0	0.00k	0.00k
514193	Freeport	4/12/2014	8:25	Thunderstorm Wind	0	0	0.00k	0.00k
514196	Freeport	4/12/2014	8:26	Thunderstorm Wind	0	0	0.00k	0.00k

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
514203	Freeport	4/12/2014	8:30	Thunderstorm Wind	0	0	0.00k	0.00k
514202	Winneshiek	4/12/2014	8:35	Thunderstorm Wind	0	0	0.00k	0.00k
514197	Freeport	4/12/2014	8:35	Thunderstorm Wind	0	0	0.00k	0.00k
524982	Freeport	6/17/2014	3:30	Thunderstorm Wind	0	0	0.00k	0.00k
524983	Freeport	6/17/2014	3:33	Thunderstorm Wind	0	0	0.00k	0.00k
524984	Lena	6/17/2014	3:36	Thunderstorm Wind	0	0	0.00k	0.00k
525452	German Valley	6/30/2014	19:51	Thunderstorm Wind	0	0	0.00k	0.00k
525453	Damascus	6/30/2014	19:55	Thunderstorm Wind	0	0	0.00k	0.00k
533060	Loran	7/12/2014	19:48	Thunderstorm Wind	0	0	0.00k	0.00k
565422	Freeport	4/9/2015	17:45	Thunderstorm Wind	0	0	0.00k	0.00k
585432	Freeport	6/20/2015	15:35	Thunderstorm Wind	0	0	0.00k	0.00k
601989	Pearl City	9/17/2015	16:11	Thunderstorm Wind	0	0	0.00k	0.00k

Note: click on location to learn more about a hazard event and episode.

Table X: Stephenson County Tornadoes 1950-2015[85]

Date	Approximate Location	Time	Path Length (miles)	Tornado Width (yards)	Deaths	Injuries	F/EF Scale
10/8/1958	Rock City	11:30 pm	81	10	1	0	F2
4/17/1959	Freeport	2:00 pm	2	10	0	0	F1
4/11/1965	Winslow	2:00 pm	27.1	167	0	40	F1
6/1/1971	Orangeville	5:15 pm	0.1	10	0	0	F1
5/28/1998	Eleroy	7:46 pm	0.1	30	0	0	F0
8/24/1998	Pearl City	11:30 am	0.5	50	0	0	F1
6/1/1999	Florence	5:50 pm	0.1	10	0	0	F0
6/6/1999	Freeport	2:14 pm	0.1	10	0	0	F0
6/14/2003	German Valley	2:15 pm	0	50	0	0	F0
6/14/2003	Florence	2:30 pm	0.5	50	0	0	F0
6/14/2003	German Valley	3:03 pm	0	50	0	0	F0
6/1/2009	Buena Vista	3:30 pm	0.33	200	0	0	EF0
7/12/2010	Rock Grove	3:03 pm	0.07	25	0	0	EF0

Note: Although the 4/11/1965 event originated near Winslow, most of the tornado's path was over land in Wisconsin. Furthermore, NOAA data may include reference to a 5/28/1998 Stockton, IL, tornado; the tornado, however, occurred in Jo Daviess County.

[85] "Des Moines Tornado Database" and "Milwaukee Tornado Database," National Weather Service, last accessed January 19, 2016

Table X: Stephenson County Lightning 1996-2015[86]

NWS ID	Location	Begin Date	Begin Time	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5718356	Orangeville	7/23/1999	18:50	0	0	$0.00	$0.00
5162209	Lena	9/11/2000	10:30	0	0	$30.00k	$0.00
5518790	Freeport	6/21/2006	3:45	0	0	$0.00	$0.00
183855	Freeport	6/19/2009	8:45	0	0	$25.00k	$0.00

[86] "Storm Events Database," NCDC, NOAA, last accessed January 22, 2016

Table X: Stephenson County Hail 1955-2015[87]

NWS ID	Location	Begin Date	Begin Time	Magnitude (in)	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
10006765	Stephenson County	6/12/1972	20:20	1.00	0	0	0.00k	0.00k
10007950	Stephenson County	6/16/1973	12:45	2.00	0	0	0.00k	0.00k
10006850	Stephenson County	6/14/1974	18:45	0.75	0	0	0.00k	0.00k
10008083	Stephenson County	3/21/1975	21:30	1.75	0	0	0.00k	0.00k
10010261	Stephenson County	6/4/1975	18:35	1.75	0	0	0.00k	0.00k
10010262	Stephenson County	6/4/1975	18:40	1.75	0	0	0.00k	0.00k
10010329	Stephenson County	7/3/1975	19:58	1.75	0	0	0.00k	0.00k
10006404	Stephenson County	4/10/1981	18:30	1.00	0	0	0.00k	0.00k
10004125	Stephenson County	6/13/1984	2:20	1.75	0	0	0.00k	0.00k
10005938	Stephenson County	7/26/1987	14:35	0.75	0	0	0.00k	0.00k
10006023	Stephenson County	4/5/1988	17:50	1.75	0	0	0.00k	0.00k
10004717	Stephenson County	3/27/1991	13:09	0.75	0	0	0.00k	0.00k
10162235	Stephenson County	4/10/1992	19:00	1.00	0	0	0.00k	0.00k
10157544	Stephenson County	6/16/1992	15:50	0.75	0	0	0.00k	0.00k
5560276	Dakota	4/19/1996	20:28	1.75	0	0	0.00k	0.00k
5560278	Davis	4/19/1996	20:28	1.75	0	0	0.00k	0.00k
5560277	Davis	4/19/1996	20:28	1.75	0	0	0.00k	0.00k
5666407	Pearl City	6/18/1998	17:05	1.00	0	0	0.00k	0.00k
5716455	Freeport	6/6/1999	15:10	0.75	0	0	0.00k	0.00k
5718354	Freeport	7/23/1999	18:00	0.75	0	0	0.00k	0.00k
5142858	Pearl City	4/16/2000	18:50	0.50	0	0	0.00k	0.00k
5145911	Orangeville	5/11/2000	8:15	0.75	0	0	0.00k	0.00k
5153556	Freeport	6/1/2000	18:20	0.75	0	0	0.00k	0.00k
5153559	Winslow	6/1/2000	18:30	1.50	0	0	0.00k	0.00k
5270217	Winslow	10/23/2001	20:36	0.75	0	0	0.00k	0.00k
5270218	Winslow	10/23/2001	21:26	1.00	0	0	0.00k	0.00k
5270219	Davis	10/23/2001	21:50	1.50	0	0	0.00k	0.00k
5292277	Pearl City	4/18/2002	15:20	0.75	0	0	0.00k	0.00k
5292280	Pearl City	4/18/2002	17:11	1.00	0	0	0.00k	0.00k
5297779	Cedarville	5/30/2002	19:45	0.88	0	0	0.00k	0.00k
5369062	Davis	7/31/2003	17:45	0.75	0	0	15.00k	5.00k
5374111	Pearl City	8/1/2003	0:30	0.75	0	0	10.00k	10.00k
5374112	Kent	8/1/2003	0:44	0.75	0	0	10.00k	10.00k
5374113	Kent	8/1/2003	0:52	1.00	0	0	20.00k	15.00k
5374114	Kent	8/1/2003	1:25	0.75	0	0	10.00k	10.00k
5374115	Eleroy	8/1/2003	1:45	1.00	0	0	20.00k	15.00k
5374116	Freeport	8/1/2003	1:48	1.50	0	0	25.00k	20.00k
5374117	Cedarville	8/1/2003	1:48	0.75	0	0	10.00k	10.00k
5416540	Eleroy	5/22/2004	3:45	0.88	0	0	0.00k	5.00k
5451891	Lake Summerset	5/19/2005	15:34	0.88	0	0	0.00k	0.00k
5502559	Freeport	4/13/2006	20:29	0.75	0	0	0.00k	0.00k
5502892	Eleroy	4/16/2006	6:22	1.00	0	0	2.00k	0.00k
5502895	German Valley	4/16/2006	6:42	0.75	0	0	0.00k	0.00k
5502896	Freeport	4/16/2006	10:55	0.75	0	0	0.00k	0.00k
5512665	Freeport	5/29/2006	12:15	1.00	0	0	0.00k	0.00k
5528003	Lena	8/25/2006	4:51	0.75	0	0	0.00k	0.50k
5534094	German Valley	9/4/2006	13:18	1.00	0	0	1.00k	1.00k

[87] "Storm Events Database," NCDC, NOAA, last accessed January 22, 2016

NWS ID	Location	Begin Date	Begin Time	Magnitude (in)	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
96216	Freeport	4/25/2008	16:14	0.75	0	0	0.00k	0.00k
100711	Waddams Grove	5/25/2008	20:57	0.88	0	0	0.00k	0.00k
117237	Freeport	6/12/2008	14:10	1.75	0	0	0.00k	0.00k
117238	Ridott	6/12/2008	14:15	3.00	0	0	0.00k	0.00k
117239	Winneshiek	6/12/2008	14:17	1.75	0	0	0.00k	0.00k
117223	Davis	6/12/2008	14:20	2.75	0	0	0.00k	0.00k
116983	Orangeville	6/20/2008	13:30	0.88	0	0	0.00k	0.00k
117024	Orangeville	6/20/2008	13:30	1.75	0	0	0.00k	0.00k
116986	Damascus	6/20/2008	13:53	0.88	0	0	0.00k	0.00k
127057	German Valley	7/2/2008	14:30	0.88	0	0	0.00k	0.00k
123718	Kent	7/31/2008	11:35	0.75	0	0	0.00k	0.00k
184151	McConnell	6/25/2009	14:30	0.88	0	0	0.00k	0.00k
184154	Buena Vista	6/25/2009	14:42	1.00	0	0	0.00k	0.00k
184155	Afolkey	6/25/2009	14:44	1.00	0	0	0.00k	0.00k
184156	Dakota	6/25/2009	14:45	1.50	0	0	0.00k	0.00k
191302	Kent	7/24/2009	17:02	2.00	0	0	0.00k	0.00k
191656	Kent	7/24/2009	17:15	2.00	0	0	50.00k	0.00k
191308	Pearl City	7/24/2009	17:25	0.88	0	0	0.00k	0.00k
230928	Lena	5/12/2010	17:04	0.88	0	0	0.00k	0.00k
244933	Freeport	6/21/2010	18:56	1.25	0	0	0.00k	0.00k
287148	Freeport	3/20/2011	12:03	0.75	0	0	0.00k	0.00k
287156	Freeport	3/20/2011	13:05	0.75	0	0	0.00k	0.00k
287154	Florence	3/20/2011	13:05	1.00	0	0	0.00k	0.00k
323608	Orangeville	6/8/2011	20:32	1.00	0	0	0.00k	0.00k
339648	Freeport	8/12/2011	15:54	0.88	0	0	0.00k	0.00k
339649	German Valley	8/12/2011	16:39	0.88	0	0	0.00k	0.00k
339650	Freeport Albertus	8/12/2011	16:40	0.88	0	0	0.00k	0.00k
386721	Pearl City	5/26/2012	3:36	0.75	0	0	0.00k	0.00k
386724	Freeport	5/26/2012	3:37	0.75	0	0	0.00k	0.00k
386726	Winneshiek	5/26/2012	3:40	0.88	0	0	0.00k	0.00k
441891	Orangeville	4/29/2013	12:29	0.88	0	0	0.00k	0.00k
458833	Freeport	7/22/2013	20:55	0.75	0	0	0.00k	0.00k
469667	Freeport	8/30/2013	18:32	1.00	0	0	0.00k	0.00k
469668	Freeport	8/30/2013	18:33	0.88	0	0	0.00k	0.00k
469669	Freeport	8/30/2013	18:34	1.25	0	0	0.00k	0.00k
469672	Freeport	8/30/2013	18:35	1.00	0	0	0.00k	0.00k
469670	Freeport	8/30/2013	18:36	1.00	0	0	0.00k	0.00k
469671	Freeport	8/30/2013	18:40	1.25	0	0	0.00k	0.00k
514187	Eleroy	4/12/2014	8:15	0.75	0	0	0.00k	0.00k
514188	Freeport	4/12/2014	8:28	0.75	0	0	0.00k	0.00k
514189	Freeport	4/12/2014	8:28	0.75	0	0	0.00k	0.00k
514190	Freeport	4/12/2014	8:30	1.00	0	0	0.00k	0.00k
514191	Winneshiek	4/12/2014	8:35	1.00	0	0	0.00k	0.00k
514192	Winneshiek	4/12/2014	8:38	1.00	0	0	0.00k	0.00k
523673	McConnell	5/12/2014	17:31	1.00	0	0	0.00k	0.00k
565413	Davis	4/9/2015	15:50	1.00	0	0	0.00k	0.00k
565414	Davis	4/9/2015	15:55	0.75	0	0	0.00k	0.00k
585433	Lena	6/20/2015	15:55	0.88	0	0	0.00k	0.00k

SEVERE WINTER STORMS

Table X: Stephenson County Winter Storms 1996-2016[88]

NWS ID	Location	Begin Date	Begin Time	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
5542536	Stephenson (zone)	1/18/1996	4:30	Winter Storm	0	0	0	0
5542569	Stephenson (zone)	1/26/1996	4:00	Winter Storm	0	0	0	0
5580152	Stephenson (zone)	11/14/1996	6:00	Winter Storm	0	0	0	0
5581007	Stephenson (zone)	12/27/1996	18:00	Winter Storm	0	0	0	0
5589779	Stephenson (zone)	1/9/1997	4:00	Winter Storm	0	0	0	0
5590062	Stephenson (zone)	1/15/1997	4:00	Winter Storm	0	0	0	0
5590049	Stephenson (zone)	1/24/1997	4:00	Winter Storm	0	0	0	0
5589242	Stephenson (zone)	2/3/1997	20:00	Winter Storm	0	0	0	0
5636737	Stephenson (zone)	1/8/1998	10:00	Winter Storm	0	0	0	0
5636758	Stephenson (zone)	1/20/1998	23:00	Winter Storm	0	0	0	0
5677911	Stephenson (zone)	12/6/1998	15:00	Winter Storm	0	0	0	0
5677923	Stephenson (zone)	12/30/1998	17:00	Winter Storm	0	0	0	0
5684842	Stephenson (zone)	1/1/1999	5:17	Winter Storm	0	0	0	0
5687369	Stephenson (zone)	3/5/1999	15:00	Winter Storm	0	0	0	0
5686263	Stephenson (zone)	3/8/1999	16:00	Winter Storm	0	0	0	0
5722035	Stephenson (zone)	12/19/1999	15:00	Winter Storm	0	0	0	0
5722061	Stephenson (zone)	12/23/1999	14:00	Winter Storm	0	0	0	0
5134263	Stephenson (zone)	1/3/2000	15:00	Winter Storm	0	0	0	0
5134693	Stephenson (zone)	1/17/2000	8:00	Winter Storm	0	0	0	0
5134724	Stephenson (zone)	1/19/2000	10:00	Winter Storm	0	0	0	0
5135233	Stephenson (zone)	1/29/2000	15:00	Winter Storm	0	0	0	0
5133963	Stephenson (zone)	2/13/2000	4:00	Winter Storm	0	0	0	0
5134402	Stephenson (zone)	2/17/2000	19:00	Winter Storm	0	0	0	0
5177356	Stephenson (zone)	12/10/2000	22:00	Winter Storm	0	0	0	0
5234068	Stephenson (zone)	2/23/2001	22:30	Winter Storm	0	0	0	0
5278786	Stephenson (zone)	1/30/2002	9:00	Winter Storm	0	0	0	0
5285551	Stephenson (zone)	3/1/2002	17:00	Winter Storm	0	0	0	0
5341542	Stephenson (zone)	1/28/2003	10:00	Winter Storm	0	0	0	0
5349421	Stephenson (zone)	3/4/2003	13:00	Winter Storm	0	0	0	0
3066	Stephenson (zone)	12/1/2006	1:35	Winter Storm	0	0	0	0
15969	Stephenson (zone)	2/24/2007	15:45	Winter Storm	0	0	0	0
63313	Stephenson (zone)	12/1/2007	11:00	Winter Storm	0	0	0	0
84099	Stephenson (zone)	2/5/2008	14:45	Winter Storm	0	0	0	0
84404	Stephenson (zone)	2/25/2008	15:00	Winter Storm	0	0	0	0
155856	Stephenson (zone)	2/20/2009	23:45	Winter Storm	0	0	0	0
204695	Stephenson (zone)	12/8/2009	3:15	Winter Storm	0	0	0	0
204844	Stephenson (zone)	1/6/2010	21:00	Winter Storm	0	0	0	0
272593	Stephenson (zone)	12/3/2010	19:00	Winter Storm	0	0	0	0
363260	Stephenson (zone)	1/12/2012	6:00	Winter Storm	0	0	0	0
430814	Stephenson (zone)	1/30/2013	9:00	Winter Storm	0	0	0	0
436626	Stephenson (zone)	2/26/2013	13:45	Winter Storm	0	0	0	0
443308	Stephenson (zone)	3/4/2013	23:00	Winter Storm	0	0	0	0
488649	Stephenson (zone)	12/21/2013	20:45	Winter Storm	0	0	0	0
504296	Stephenson (zone)	2/17/2014	7:00	Winter Storm	0	0	0	0
552375	Stephenson (zone)	2/1/2015	0:00	Winter Storm	0	0	0	0

[88] "Storm Events Database," NCDC, NOAA, last accessed January 19, 2016

Appendix E: Tier II Facilities

Name	Latitude	Longitude
Adkins Energy	42.362	-89.804
Alliance Commodities	42.359	-89.805
Anchor Harvey	42.259	-89.623
Baileyville Coop	42.201	-89.529
Berner Food	42.431	-89.573
Bowen Oil Co Bulk	42.469	-89.650
ComEd Freeport	42.311	-89.670
Dakota Co-Op	42.407	-89.497
Danfoss Power	42.312	-89.615
Devansoy	42.448	-89.478
District Fuel Pumps	42.289	-89.626
Ferrellgas	42.252	-89.631
Freeport	42.345	-89.613
Freeport Headend	42.316	-89.610
Frontier Communications	42.296	-89.623
Gills Disposal	42.308	-89.625
Highland Chemical Ag Tech	42.210	-89.678
Honeywell Plant 1	42.301	-89.613
Honeywell Plant 2	42.297	-89.619
Honeywell Plant 4	42.265	-89.624
Kolb Lena Cheese	42.356	-89.915
Modern Plating	42.293	-89.601
Pearl City Elevator	42.266	-89.826
Pearl City Elevator	42.435	-89.725
SPG International	42.304	-89.584
Stephenson Service	42.476	-89.574
Stephenson Service	42.248	-89.826
Stephenson Service	42.297	-89.605
Stephenson Service	42.374	-89.815
Stephenson Service	42.277	-89.473
Super Pantry 49	42.281	-89.627
Tate and Lyle Custom Ingredients	42.482	-89.555
Titan Tire	42.274	-89.538
Tri Star Metals	42.258	-89.627
Tri Star Metals	42.289	-89.601
UPS Freeport	42.302	-89.615
Van Diest Supply	42.276	-89.598
Verizon Wireless Summerset	42.434	-89.422

Note: current as of 2015

Appendix F: Survey Results

The following pages include the survey form and responses. 87 total responses were received.

Survey Form

Edit this form

Stephenson County Hazards Survey

Part of preparing for natural and human-caused disasters is creating a hazard mitigation plan. A hazard mitigation plan is required to remain eligible to receive certain mitigation funds that can be used before or after a disaster. The plan also helps local officials decide what projects and programs will receive priority. If you live or work in any of the following communities, please help the county's planning process by completing this short 12-question survey.

*Cedarville
*Dakota
*Davis
*Freeport
*German Valley
*Lena
*Orangeville
*Pearl City
*Ridott
*Rock City
*Winslow
*Or any incorporated or unincorporated rural area/community in Stephenson County, including Lake Summerset.

Questions? Please contact any of the following individuals:

Daniel Payette, Blackhawk Hills Regional Council,
daniel.payette@blackhawkhills.com, (815) 625-3854

Robert Baker, Stephenson County Emergency Management Agency,
robert.baker@stcoema.org, (815) 599-0344

Alex Mills, City of Freeport Community Development Department,
amills@cityoffreeport.org, (815) 235-8221 x252

* Required

1. Which hazards pose the greatest risk to Stephenson County? *

When answering, try to consider each hazard's impact on life and property, the economy, the environment, and special needs populations (e.g., the developmentally disabled) in Stephenson County.

	Major risk	Moderate risk	Minor risk
Agricultural Disease Outbreaks (animal or crop)	○	○	○
Civil Disturbances (rioting, etc.)	○	○	○
Cyber Security Breach (hacking into sewer plant systems, etc.)	○	○	○
Drought	○	○	○
Earthquakes	○	○	○
Energy Shortages	○	○	○
Extreme Temperatures (hot & cold)	○	○	○
Flooding	○	○	○
Hazardous Materials Incidents (chemical spill, etc.)	○	○	○
Human Health Emergencies (disease quarantine, etc.)	○	○	○
Major Fires and Explosions	○	○	○
Nuclear and Radiological Incidents	○	○	○
Severe Thunderstorms, Tornados, & Wind-Related	○	○	○
Severe Winter Storms	○	○	○
Terrorism Incidents	○	○	○
Transportation Incidents (bridge collapse, overturned semi, etc.)	○	○	○

2. Can you think of other hazards occurring in Stephenson County that should be included?

If you can, please list them here.

3. Have you been impacted by any of the following in Stephenson County? *

Please select all that apply.

- [ ] Flooding
- [ ] Severe thunderstorms
- [ ] Severe winter storms
- [ ] Another hazard
- [ ] No, I have not

4. How do you rate the following actions that can be taken to eliminate or reduce the impacts of hazards? *

	Very important	Somewhat important	Not important
Prevention (action through policy, planning, zoning, building codes, etc.)	○	○	○
Property Protection (action by modifying existing homes and buildings)	○	○	○
Natural Resources Protection (action by preserving or restoring land to reduce damage during hazard events)	○	○	○
Emergency Preparedness & Services (action that protects people and property during or after hazard events)	○	○	○
Infrastructure (action through engineering or construction)	○	○	○
Programming (action through awareness and education)	○	○	○

5. Do you own or rent your home? *

If you rent, live with relative, or other, skip to 8.

- ○ Own in Stephenson County
- ○ Own outside of Stephenson County
- ○ Rent in Stephenson County
- ○ Rent outside of Stephenson County
- ○ Live with relative in Stephenson County
- ○ Live with relative outside of Stephenson County
- ○ Other: _____

6. If you own your home, do you have flood insurance for your home?

- ○ Yes
- ○ No, but I want it
- ○ No, and I do not need it
- ○ I do not own a home
- ○ I don't know

7. If you own your home, what types of improvements have you made or would you consider making? Assume money is not an issue.

	I have done this	I would consider doing this	I would probably not do this	I don't know	Not applicable
Clear debris from catch basins or ditches	○	○	○	○	○
Install rain barrels	○	○	○	○	○
Install rain gardens	○	○	○	○	○
Reduce or remove impervious surface (excess concrete, asphalt, etc.)	○	○	○	○	○
Install sewer back-flow prevention	○	○	○	○	○
Ensure sump pumps flow into storm sewer	○	○	○	○	○
Elevate structures	○	○	○	○	○
Elevate utilities or appliances (air conditioner, etc.)	○	○	○	○	○
Create an emergency kit & plan	○	○	○	○	○
Install gutters or yard drains	○	○	○	○	○
Add attic or wall insulation	○	○	○	○	○
Fix or install new doors or windows	○	○	○	○	○
Fix or install new roof	○	○	○	○	○
Maintain trees and landscaping (to protect power lines)	○	○	○	○	○
Install a natural gas or propane back-up generator	○	○	○	○	○
Get a weather					

radio

8. Has your employer taken any mitigation actions, like the above? *

- Yes
- No
- I don't know
- Not employed

9. Where do you work? *

- Within Stephenson County
- Outside of Stephenson County
- Not employed

10. What is your ZIP Code? *

11. What is your age range? *

- 18-25
- 26-35
- 36-45
- 46-55
- 56-65
- 66 or older

12. What is your income? *

- $0 to $14,999
- $15,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 or more

Contact Information

Not required, but helpful if you want more information

Name

Not required, but helpful if you want more information

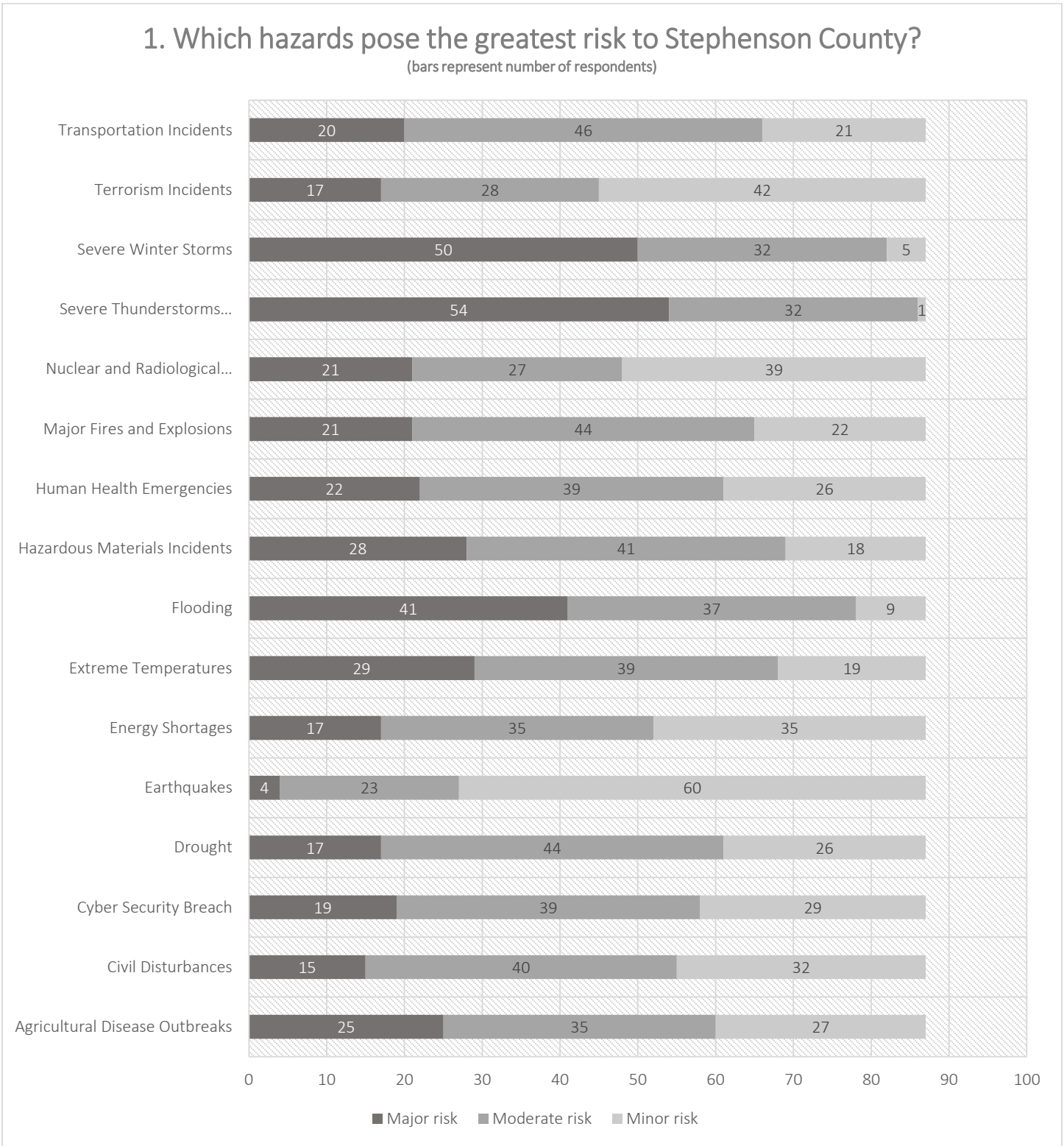
Email

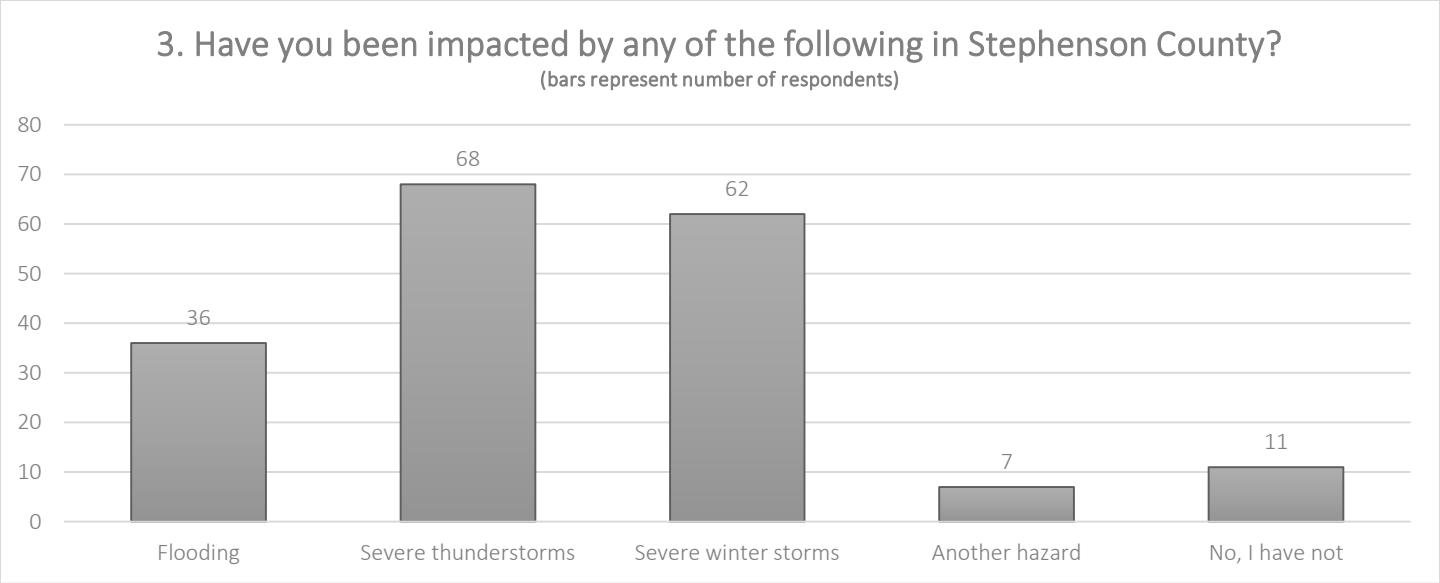
Not required, but helpful if you want more information

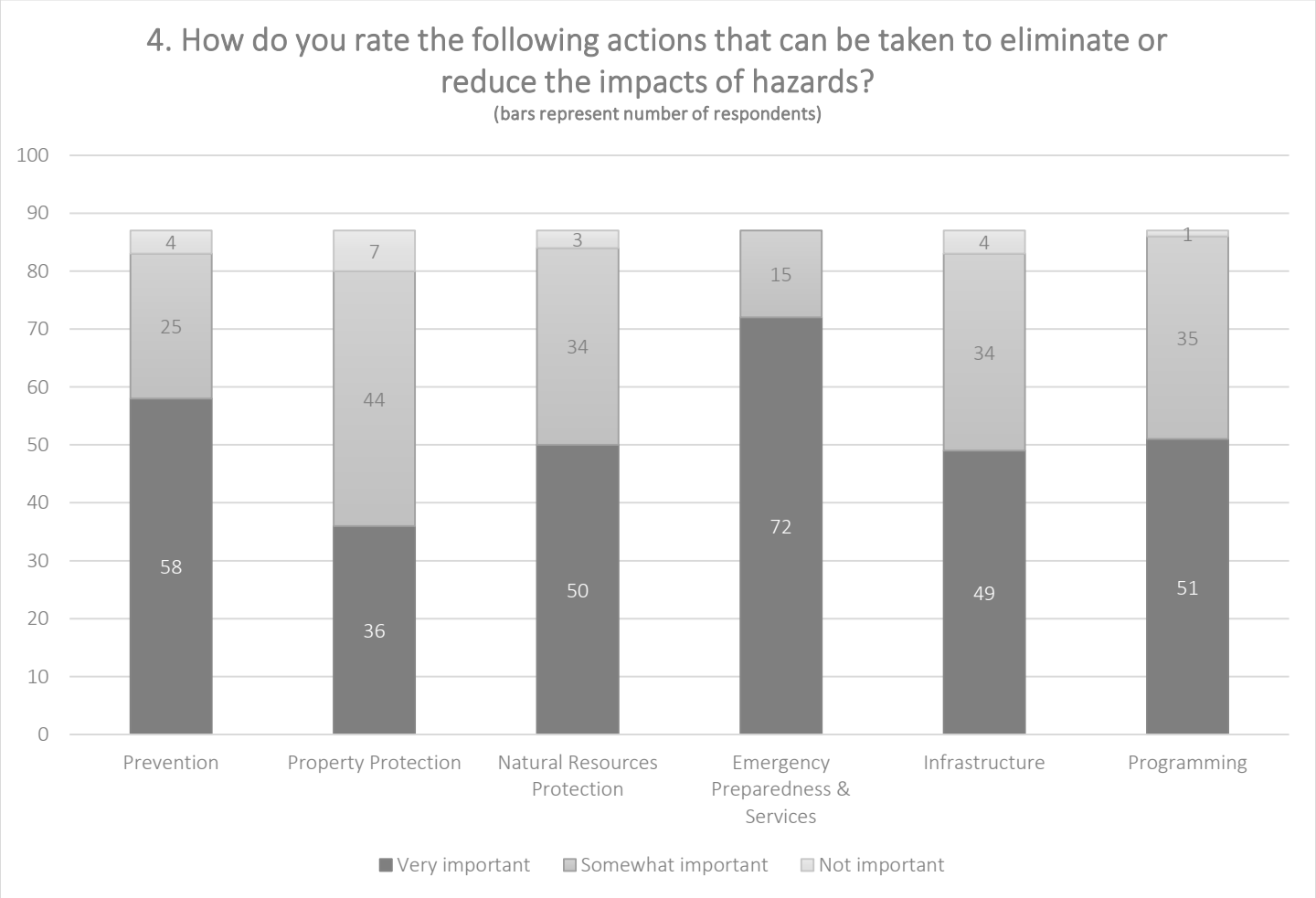
Submit

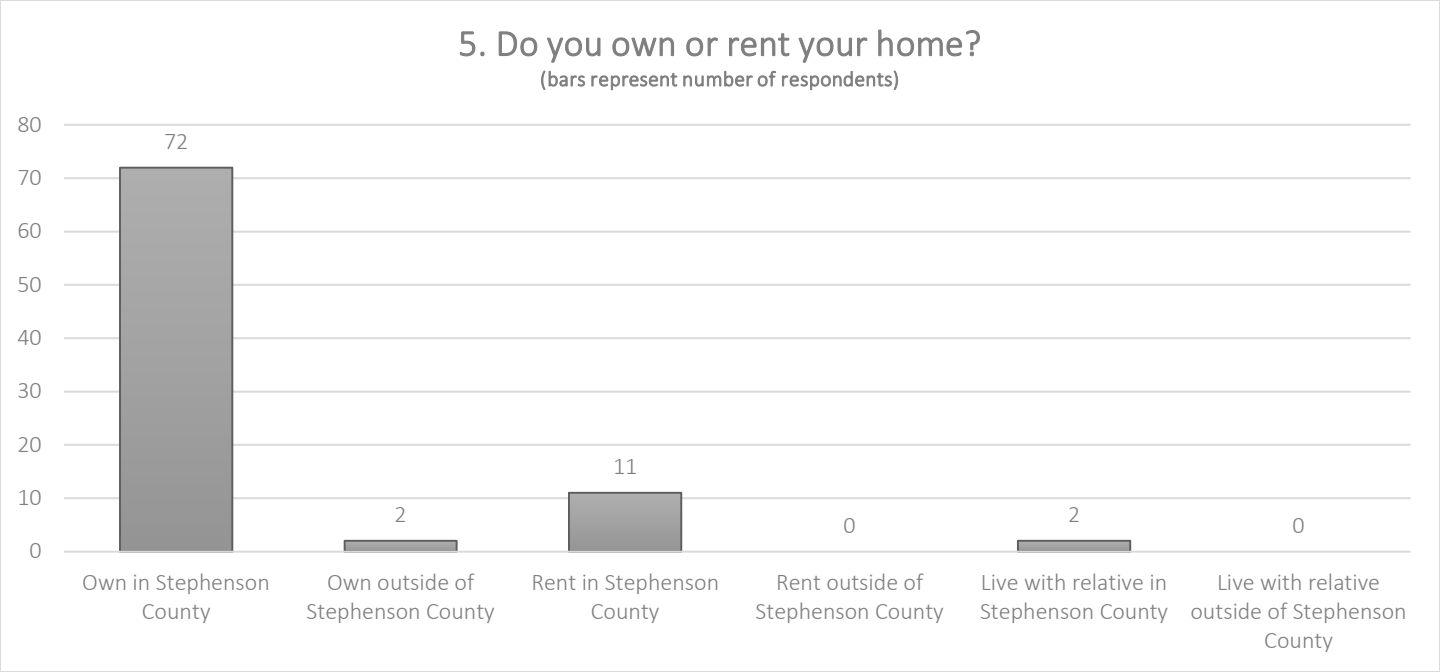
Never submit passwords through Google Forms.

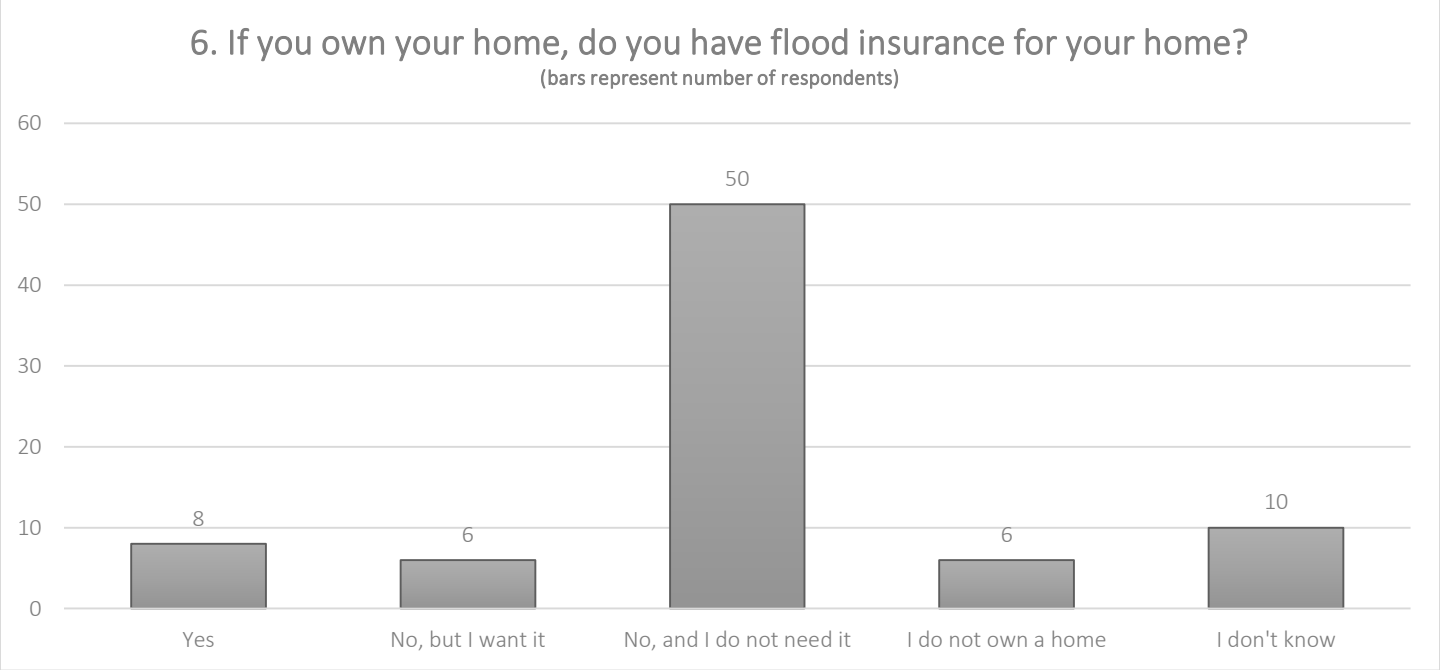
Survey Responses




3. Have you been impacted by any of the following in Stephenson County?
(bars represent number of respondents)
80
70
60
50
40
30
20
10
0
36
68
62
7
11
Flooding
Severe thunderstorms
Severe winter storms
Another hazard
No, I have not

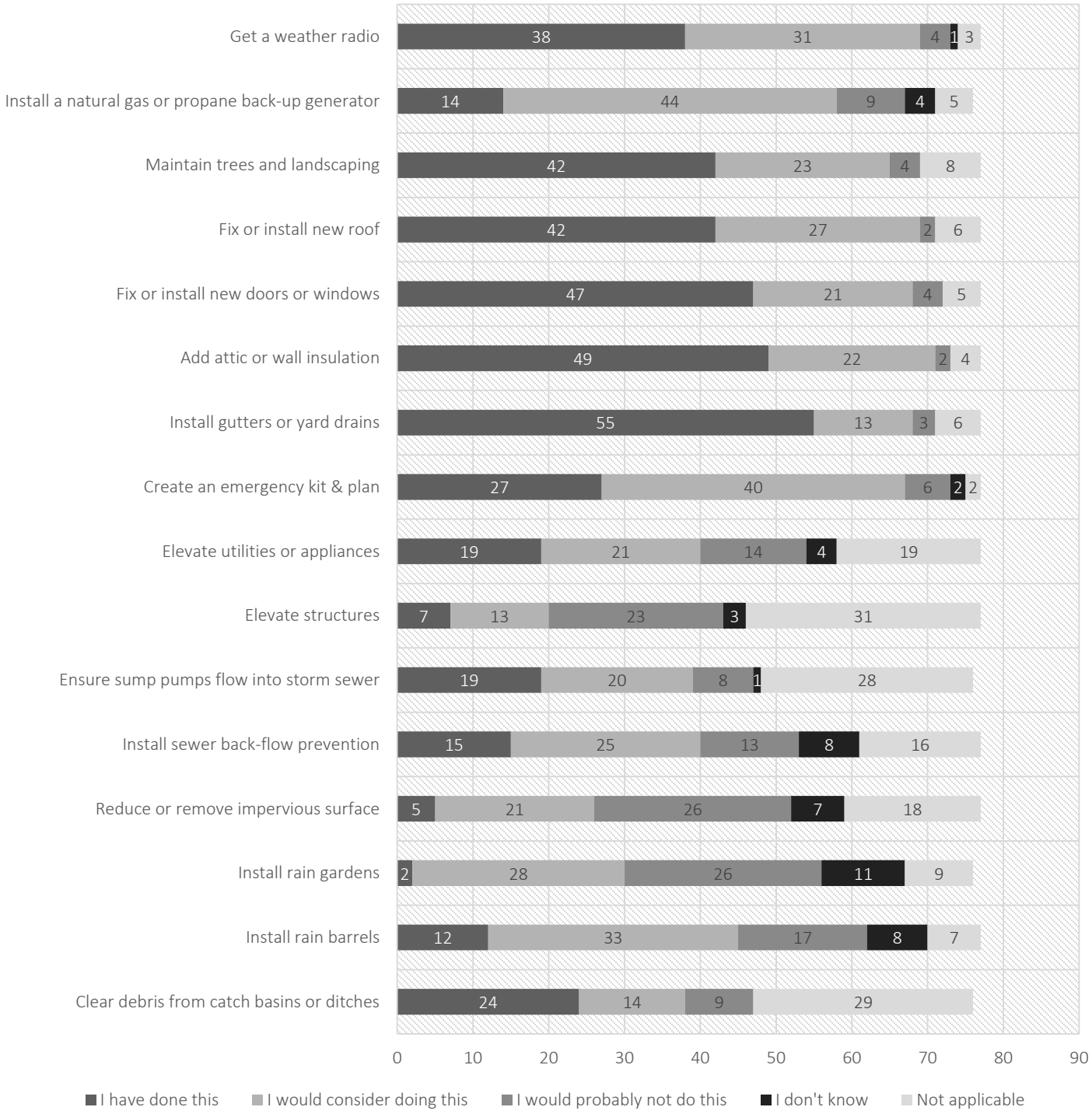

4. How do you rate the following actions that can be taken to eliminate or reduce the impacts of hazards?
(bars represent number of respondents)
100
90
80
70
60
50
40
30
20
10
0
4
25
58
7
44
36
3
34
50
15
72
4
34
49
1
35
51
Prevention
Property Protection
Natural Resources Protection
Emergency Preparedness & Services
Infrastructure
Programming
Very important
Somewhat important
Not important

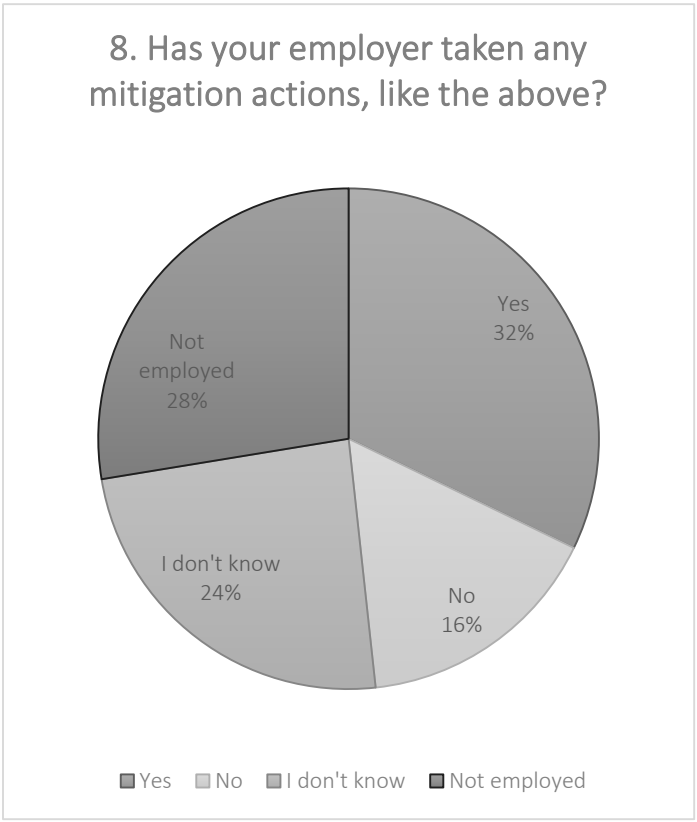

5. Do you own or rent your home?
(bars represent number of respondents)
80
70
60
50
40
30
20
10
0
72
2
11
0
2
0
Own in Stephenson County
Own outside of Stephenson County
Rent in Stephenson County
Rent outside of Stephenson County
Live with relative in Stephenson County
Live with relative outside of Stephenson County

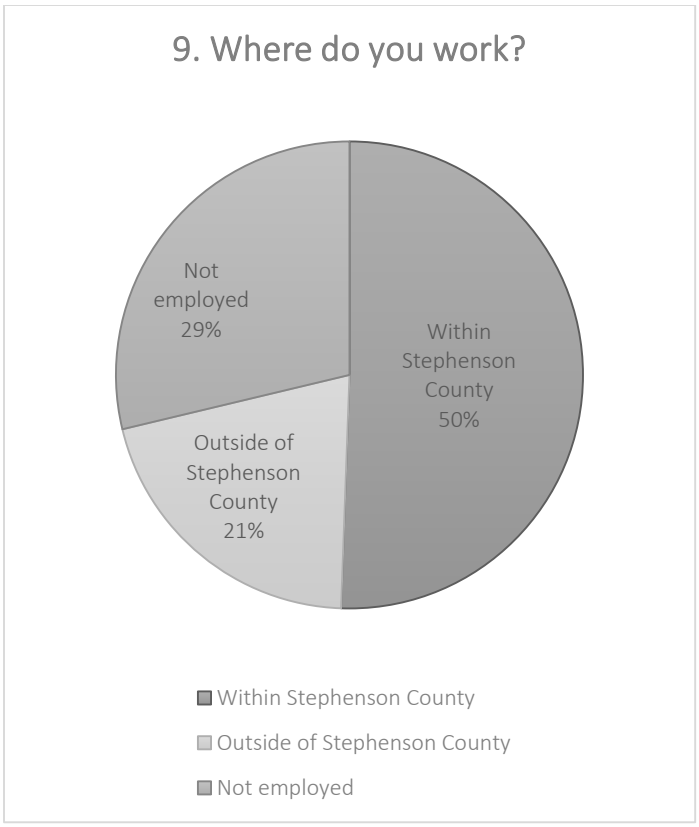

6. If you own your home, do you have flood insurance for your home?
(bars represent number of respondents)
60
50
40
30
20
10
0
8
6
50
6
10
Yes
No, but I want it
No, and I do not need it
I do not own a home
I don't know

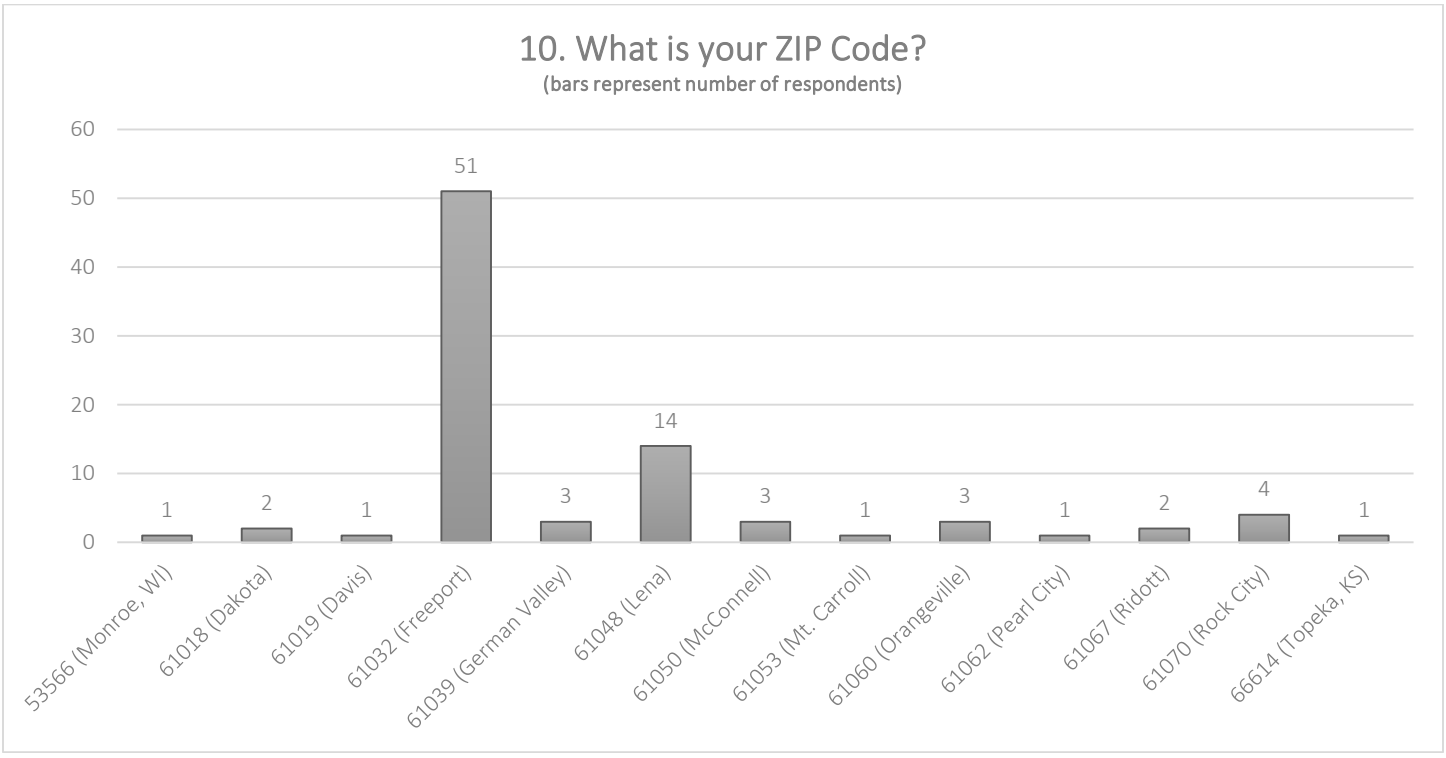
7. If you own your home, what types of improvements have you made or would you consider making? Assume money is not an issue.

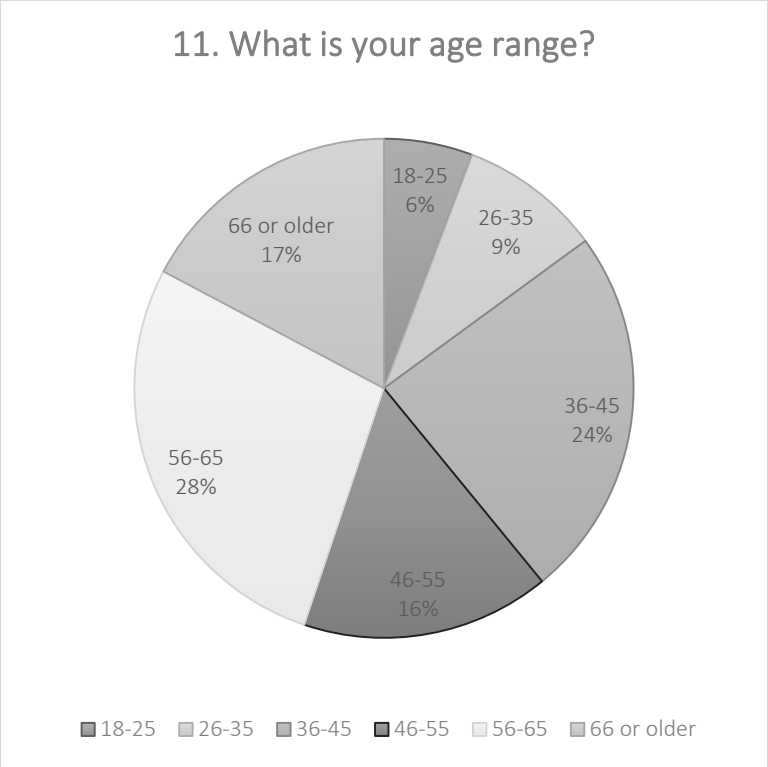
(bars represent number of respondents)

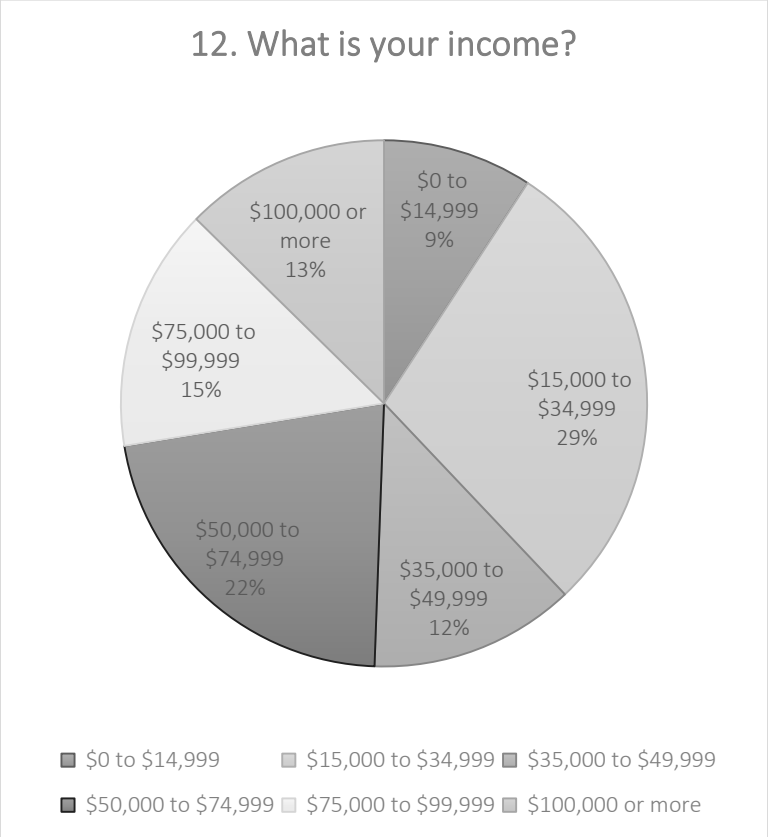



8. Has your employer taken any mitigation actions, like the above?
Yes 32%
No 16%
I don't know 24%
Not employed 28%
Yes
No
I don't know
Not employed


9. Where do you work?
Within Stephenson County 50%
Outside of Stephenson County 21%
Not employed 29%
Within Stephenson County
Outside of Stephenson County
Not employed


10. What is your ZIP Code?
(bars represent number of respondents)
60
50
40
30
20
10
0
1
2
1
51
3
14
3
1
3
1
2
4
1
53566 (Monroe, WI)
61018 (Dakota)
61019 (Davis)
61032 (Freeport)
61039 (German Valley)
61048 (Lena)
61050 (McConnell)
61053 (Mt. Carroll)
61060 (Orangeville)
61062 (Pearl City)
61067 (Ridott)
61070 (Rock City)
66614 (Topeka, KS)


11. What is your age range?
18-25
6%
26-35
9%
36-45
24%
46-55
16%
56-65
28%
66 or older
17%
18-25
26-35
36-45
46-55
56-65
66 or older


12. What is your income?
$0 to
$14,999
9%
$15,000 to
$34,999
29%
$35,000 to
$49,999
12%
$50,000 to
$74,999
22%
$75,000 to
$99,999
15%
$100,000 or
more
13%
$0 to $14,999
$15,000 to $34,999
$35,000 to $49,999
$50,000 to $74,999
$75,000 to $99,999
$100,000 or more

Appendix G: Resolutions by Jurisdiction

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, Stephenson County recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, Stephenson County participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that Stephenson County hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
William Hadley, Chairman

_____
Attested by: Vici Otte, County Clerk

RESOLUTION #_____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Cedarville recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Cedarville participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Cedarville hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Shawn Cox, Village President

_____
Attested by: Cindy Lloyd, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Dakota recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Dakota participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Dakota hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Timothy Last, Village President

_____
Attested by: Tim Wilson, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Davis recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Davis participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Davis hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____

Bradley C. Meinert, Village President

_____

Attested by: Kimberly Satness, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the City of Freeport recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the City of Freeport participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the City of Freeport hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____

James Gitz, Mayor

_____

Attested by: Martha E. Zuravel, City Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of German Valley recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of German Valley participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of German Valley hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Mark Jewell, Village President

_____
Attested by: Nancy Borchers, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Lena recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Lena participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Lena hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____

Dennis Bergman, Village President

_____

Attested by: Lynn Polhill, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Orangeville recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Orangeville participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Orangeville hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Michael Siedschlag, Village President

_____
Attested by: Leslie Schmidt, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Pearl City recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Pearl City participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Pearl City hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____

Robert Knoup, Village President

_____

Attested by: Cheryl Liebenstein, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Ridott recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Ridott participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Ridott hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Kim Kopp, Village President

_____
Attested by: Darlene Greenfield, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Rock City recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Rock City participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Rock City hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Charles Halblieb, Village President

_____
Attested by: Melody Sweet, Village Clerk

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the Village of Winslow recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the Village of Winslow participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the Village of Winslow hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan; and

BE IT FURTHER RESOLVED that the Stephenson County Emergency Management Agency will submit on behalf of participating municipalities the adopted plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED this _____ day of _____ 2016.

_____
Terri Rose, Village President

_____
Attested by: Amber Albright, Village Clerk

Appendix H: Mission Statement

The following was created by the planning committee and used for general guidance during the planning process:

Update, implement, and maintain a multi-hazard mitigation plan for Stephenson County that ensures disaster resiliency and emphasizes the following priorities:

- *Public engagement:* provide opportunities for participation when the plan is updated, implemented, or maintained; promote awareness/education; involve as many relevant stakeholders as possible.
- *Community asset preservation and protection:* consider life, property, cultural and historical assets, and the environment; prioritize projects and programs that prevent human death or injury.
- *Comprehensive approach:* identify all hazards, assess risks, and establish mitigation goals and actions, including relevant projects and programs; consider historical precedent and potential for future hazard events.
- *Respect for each jurisdiction:* work with individual municipalities and incorporate local information where appropriate and available; maintain continuity between county and municipalities.