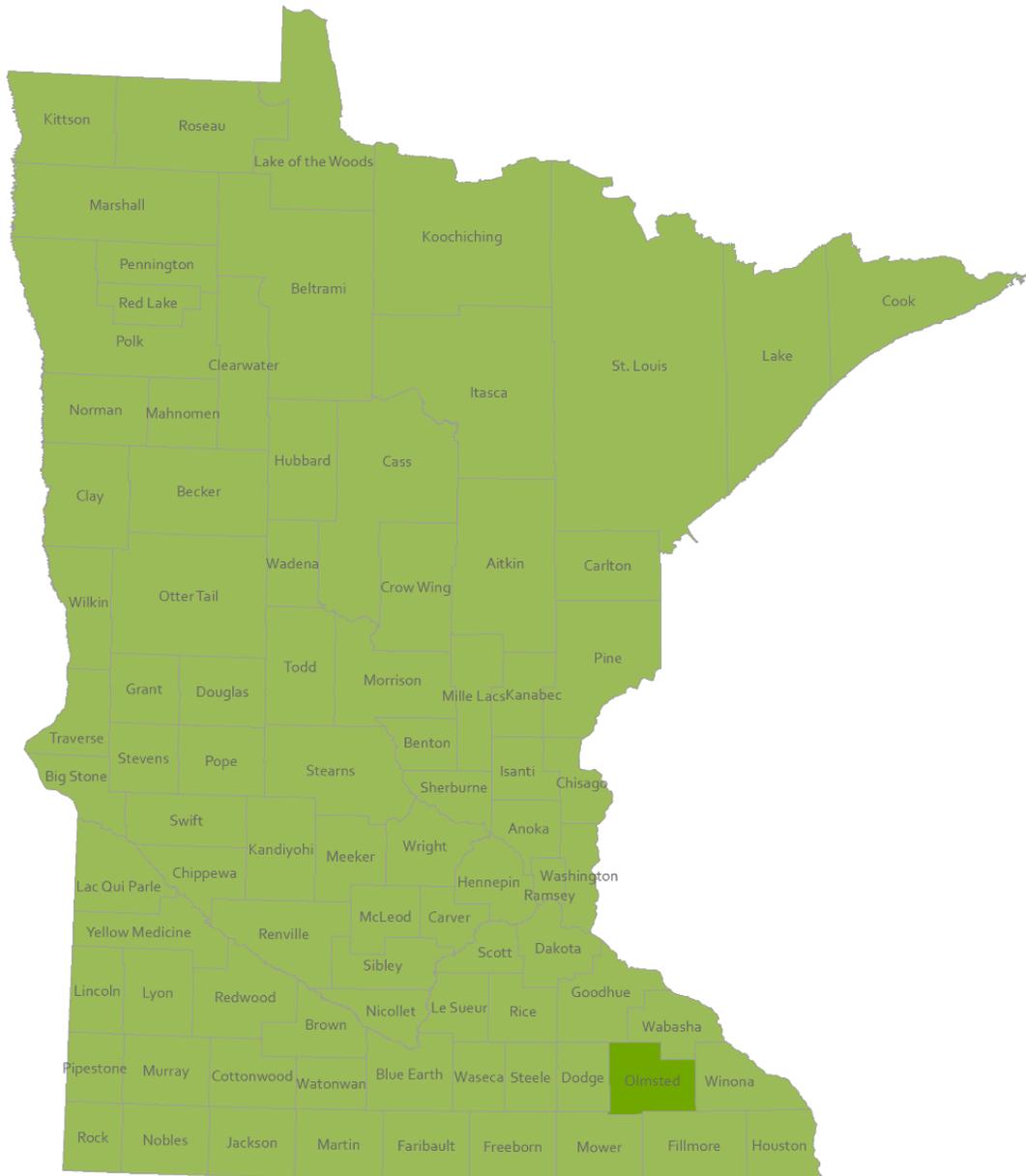


# Multi-Hazard Mitigation Plan

## Olmsted County, Minnesota, 2017



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# Multi-Hazard Mitigation Plan

## Olmsted County, Minnesota

2017

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# Section 1 – Introduction

## 1.1 Introduction

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals; hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies is a primary mechanism in achieving FEMA's goal.

Between 1960 and 2014, natural hazards cost the U.S. an annual average loss of \$15.6 billion (Hazards & Vulnerability Research Institute, 2015).

Hazard mitigation planning and preparedness will be the most effective instrument to diminish losses by reducing the impact of disasters upon people and property. Although mitigation efforts will not eliminate all disasters, each county shall endeavor to be as prepared as possible for a disaster.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for communities to be eligible for future mitigation funds, they must adopt an MHMP.

According to an analysis by the Multihazard Mitigation Council (a public/private partnership designed to reduce the economic and social costs of natural hazards), for every dollar spent by the federal treasury on FEMA mitigation grants, \$3.65 is saved: "The present value of potential annual savings to the federal treasury because of the FEMA grants studied is approximately \$970 million compared to an annual budget expenditure on these grants of \$265 million" (Multihazard Mitigation Council, 2005). Thus, every dollar spent on mitigation grants leads to an average of \$3.65 in avoided costs post-disaster and increased federal tax revenues.

Olmsted County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. Hazards such as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms, and droughts have the potential for inflicting vast economic loss and personal hardship. In 2013, Minnesota had some of the highest weather-related disaster claims in the country (MN Environmental Quality Board, 2014).

This Multi-Hazard Mitigation Plan represents the efforts of Olmsted County and its local governments to fulfill the responsibility for hazard mitigation planning. The intent of the plan is to reduce the actual threat of specific hazards by limiting the impact of damages and losses.

### 1.1.1 Scope

The Olmsted County Emergency Management Director and the University of Minnesota Duluth Geospatial Analysis Center have combined efforts to update the 2009 Olmsted County Multi-Hazard Mitigation Plan.

This Multi-Hazard Mitigation Plan evaluates and ranks the major natural hazards affecting Olmsted County as determined by frequency of event, economic impact, deaths, and injuries. Mitigation recommendations are based on input from state and local agencies, public input, and national best practices.

The University of Minnesota Duluth Geospatial Analysis Center (GAC) performed the hazard risk assessment for 100-year floods using the Hazus-MH GIS tool. In recognition of the importance of planning in mitigation activities, FEMA created **Hazards USA Multi-Hazard** (Hazus-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. The Minnesota Homeland Security and Emergency Management (HSEM) office has determined that Hazus-MH should play a critical role in Minnesota's risk assessments, and therefore the 100-year flood hazard analysis is introduced in this plan.

This is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville. The Olmsted County risks and mitigation activities identified in this plan also incorporate the concerns and needs of townships, school districts, and other entities participating in this plan. Olmsted County's largest city, Rochester, is not included because it has its own Multi-Hazard Mitigation Plan.

Members from each of these jurisdictions actively participated in the planning process by attending workgroup meetings, providing information, suggesting mitigation strategies and reviewing the plan document. Each jurisdiction will adopt the plan by resolution after approval by FEMA. County and local city resolutions will be added by Olmsted County after final approval by FEMA, in Appendix D in the back of the plan.

Olmsted County has specified the following goals for this Multi-Hazard Mitigation Plan:

- To evaluate and rank the hazards that impact Olmsted County.
- To determine the extent of existing mitigation programs and policy capabilities within Olmsted County.
- To create a detailed, working document that will establish a standardized process for ensuring coordination of hazard mitigation efforts and to implement an ongoing and comprehensive hazard mitigation strategy.
- To familiarize state and local officials and the general public about comprehensive hazard mitigation in Olmsted County and obtain their support.

### **1.1.2 Hazard Mitigation Definition**

Hazard mitigation may be defined as any action taken to eliminate or reduce the long-term risk to human life and property from natural hazards. Potential types of hazard mitigation measures include the following:

- Structural hazard control or protection projects

- Retrofitting of facilities
- Acquisition and relocation of structures
- Development of mitigation standards, regulations, policies, and programs
- Public awareness and education programs
- Development or improvement of warning systems

### **1.1.3 Benefits of Mitigation Planning**

The benefits of hazard mitigation planning include the following:

- Saving lives, protecting the health of the public, and reducing injuries
- Preventing or reducing property damage
- Reducing economic losses
- Minimizing social dislocation and stress
- Reducing agricultural losses
- Maintaining critical facilities in functioning order
- Protecting infrastructure from damage
- Protecting mental health
- Reducing legal liability of government and public officials

## **1.2 State Administration of Mitigation Grants**

FEMA currently has 3 mitigation grant programs that are administered by the State of Minnesota: the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. The HMGP, PDM and FMA programs are administered through the Department of Public Safety, Division of Homeland Security and Emergency Management.

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## Section 2 – Public Planning Process

### 2.1 Steering Committee Information

The Olmsted County multi-hazard mitigation plan steering committee is headed by the Olmsted County Emergency Management Director, who is the primary point of contact. University of Minnesota Duluth staff under contract with Olmsted County includes Stacey Stark (GAC Director), Steve Graham (GAC Research Analyst) and Micaella Penning (GAC Research Assistant). GAC also sub-contracted with planner Bonnie Hundrieser of Hundrieser Consulting, LLC. Members of the Olmsted County MHMP steering committee include representatives from the public, private, and governmental sectors. Table 1 identifies the steering committee individuals and the organizations they represent.

Table 1. Multi-Hazard Mitigation Steering Committee

Name	Agency/Organization	Participant Title
Amy Evans	Olmsted County Public Health	Emergency Preparedness Coordinator
Ann Fahy-Gust	New Haven Township	Planning & Zoning Admin
Bill Schimmel	City of Stewartville	Administrator
Brenda Lundquist	Rock Dell Township	Township Clerk
Brian Burkholder	City of Chatfield	Superintendent of City Services-City of Chatfield
Cain Dolan	City of Oronoco	Fire Department Captain
Cassie Deets	Olmsted County Emergency Management	Deputy Director of Emergency Management
Chad Schuman	Olmsted County Public Works	Highway Maintenance Engineer
Dale Wagner	Orion Township	Supervisor
Dan Sundt	Oronoco Fire Dept	Fire Chief
Daniel O'Neil	Eyota Township	Chairperson
Dave Nault	Olmsted County IT	Information Technology Manager
Dawn Beck	Olmsted County Public Health	Associate Director of Public Health
Drew Moessner	Salem Township	Chairperson
Gary Fitterer	People's Energy Co-op	Director of Engineering
Geri Ihrke	Quincy Township	Treasurer
Gwen Stevens	People's Energy Co-op	Director of Member and Community Relations
Heidi Welsch	Olmsted County Administration	Deputy Administrator
James Hanson	Kalmar Township	Supervisor
Janice Chezick	Olmsted GIS/Planning	GIS Coordinator/ Supervisor
Jeremy Magnuson	City of Dover	Emergency Manager
John Helmers	Olmsted Co Environmental Resources	Director

Name	Agency/Organization	Participant Title
Julie Hackman	Olmsted County Property Records	Associate Director PRL
Marlis Knowlton	City of Eyota	Clerk/Treasurer
Martin Larsen	Olmsted County Feedlot Tech	Feedlot Technician
Mary Andrist	New Haven Township	Town Board Supervisor
Mary Blair Hoeft	City of Byron	Administrator
Michael Sheehan	Olmsted Co Director of Public Works	Director of Public Works
Michelle Ridd	Olmsted County Emergency Management	Office Manager
Mike Black	Cascade Township	Supervisor, Seat 3
Mike Bromberg	Olmsted County Emergency Management	Captain, Emergency Management Director
Nathan Redalen	Pleasant Grove Township	Chairperson
Pam Fuller	Olmsted County Property Records/Elections	PRL Supervisor
Pete Giesen	Olmsted Co Public Health	Director of Public Health
R. Arlen Heathman	Cascade Township	Supervisor, Seat 1
Richard Lyke	Oronoco Township	Supervisor
Roger Bjerke	Marion Township	Supervisor
Roger Richardson	Elmira Township	Supervisor
Sandi Goslee	Olmsted-Rochester Planning	Principal Planner
Sandra Jessen	City of Oronoco	Town Clerk/Treasurer
Skip Langer	Olmsted County SWCD	Soil Conservation Director
Sue Struckmann	Olmsted Co Public Works/Environmental Resources	Executive Assistant
Tom Ryan	Olmsted Co Park Superintendent	Park Superintendent
Troy Swancutt	People's Energy Co-op	Director of Operations
Vance Swisher	Stewartville Fire Department/City of Stewartville	Emergency Manager
Wayne King	City of Pine Island	Street Supervisor/ Emergency Manager

Jurisdictional representatives participating on the steering committee were contacted throughout the plan update process to provide feedback on the hazards of concern to their community and the mitigation actions which they would seek to implement upon plan adoption. The list of final mitigation actions was divided into jurisdiction-specific mitigation action charts so that each jurisdiction could see and address those actions that applied specifically to their cities (see *Appendix G: Mitigation Actions by Jurisdiction*).

## 2.2 Review of Existing Plans

Olmsted County and its local communities utilized a variety of planning documents to direct community development. These documents include a Comprehensive/Master Plan, Capital Improvements Plan, Emergency Operations Plan, Transportation Plan, Continuity of Operations Plan, etc. (see Appendix J for a full listing of plans and programs in place in Olmsted County). The planning process also incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 2 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 2. Planning Documents used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
Olmsted County Soil and Water Conservation District	2017	Operational Plan	The purpose of Olmsted Soil and Water Conservation District’s Operational Plan is to provide guidance and direction to District staff and supervisors for the goals and mission set forth by Olmsted Soil and Water Conservation District.	Section 4
Minnesota Division of Homeland Security and Emergency Management	2014	Minnesota All-Hazard Mitigation Plan Update	Statewide hazard mitigation plan.	Section 4
Olmsted County	2014	Threat Hazard Identification and Risk Assessment (THIRA)	The Threat and Hazard Identification and Risk Assessment is a 4 step common risk assessment process that helps the whole community understand its risks and estimate capability requirements.	Section 4
Rochester-Olmsted Planning Department	2013-2023	Olmsted County Water Management Plan	Assesses priority concerns for water resource issues in the county.	Section 3

## 2.3 Planning Process Timeline and Steps

In order to update the 2009 Olmsted County Multi-Hazard Mitigation Plan, UMD consultants worked in coordination with the Olmsted County Emergency Management Director, State of Minnesota Hazard Mitigation officials, and members of the steering committee. The goals of the updating process were to include more recent data documenting the critical infrastructure and hazards faced by Olmsted County, reformat and reorganize the plan to reflect definitions of hazards as expressed in the 2008 State of Minnesota Multi-Hazard Identification and Risk Assessment Plan, and reflect current hazard mitigation priorities in Olmsted County. Therefore, the new plan includes not only new data documenting the types of hazards faced by Olmsted County residents and emergency planning officials, but also new thinking about how to best address these hazards.

This is a multi-jurisdictional plan that covers Olmsted County and the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island and Stewartville. The Olmsted County risks and mitigation activities

identified in this plan incorporate the concerns and needs of townships, school districts, and other entities participating in this plan.

On July 12, 2016, the Geospatial Analysis Center hosted a kickoff webinar that was attended by the Olmsted County Emergency Management Director. The webinar included a project overview, GAC background, the roles and responsibilities of the Emergency Management Director, contents of the Multi-Hazard Mitigation Plan, planning process and projected timeline (see Appendix E for webinar slides).

A steering committee meeting took place on November 24, 2016, at Canadian Honker Events at Apache in Rochester, which included the Olmsted County MHMP steering committee, UMD staff, and Bonnie Hundrieser of Hundrieser Consulting, LLC. The steering committee was provided with an overview of the purpose, process and timeline for the Olmsted County Multi-Hazard Mitigation Plan update, as well as the role and responsibilities of steering committee members. Appendix E provides documentation of steering committee meeting summaries, including participant sign-in sheets and presentation slides.

Steering committee members were engaged in providing feedback on plans and programs in place as they relate to hazards facing the county, and they discussed potential mitigation actions to be added to the plan. This information was used to inform the development of mitigation strategies in the updated plan.

In February 2017, Olmsted County issued a news release inviting public feedback and participation for the Olmsted County MHMP update (for complete documentation, see *Appendix F: Public Outreach & Engagement Documentation*).

On February 23, 2017, members of the steering committee convened to conduct a review and discussion of the draft mitigation action charts developed for Olmsted County and the city jurisdictions participating in the plan. The meeting was facilitated by Bonnie Hundrieser, a member of the University of Minnesota – Duluth Geospatial Analysis Center (GAC) planning team that is leading the update of the Olmsted County MHMP. See Appendix E for a full meeting summary.

In order to provide opportunity for public input, Olmsted County issued a second new release on May 23, 2017 inviting public review and feedback on the draft plan. The news release provided information on where the plan could be viewed and comments submitted. The UMD Geospatial Analysis Center hosted a webpage to post the full draft Olmsted County MHMP, including excerpts of the Olmsted County Master Mitigation Action Chart, each of the jurisdictional mitigation action charts, an electronic feedback form, and an Esri Story Map that documents the history of natural hazards in Olmsted County. Story maps combine mapping and analysis with multi-media content such as images, videos, text, and hyperlinks. Data layers such as the 100-year floodplain and potential economic loss produced with the FEMA Hazus-MH tool were integrated with poignant imagery from past events, in the hope that the story map would serve as a helpful tool for visually 'reminding' residents about hazards, to encourage their participation in future mitigation (<http://arcg.is/2hSfsMS>).

Appendix F provides documentation of the public outreach for feedback on the draft plan by Olmsted County and jurisdictions. The public feedback period for the draft plan was open from 5/23/17 to 6/9/17, for a total of 18 days.

*Table 3. Olmsted County Hazard Mitigation Update Meetings and Public Outreach*

Meeting Type	Date	Location
Kickoff Webinar	7/12/2016	Hosted online by GAC in Duluth
Steering Committee	10/24/2016	Canadian Honker Events at Apache, Rochester
Steering Committee	2/23/2017	Olmsted County Emergency Operations Center
Public Outreach	2/2017	News release inviting public feedback
Public Outreach	5/23/2017-6/9/2017	News release inviting public review of draft plan materials and feedback

At the close of the public outreach period, the UMD consultants worked with the Olmsted County Emergency Management Director and members of the steering committee to incorporate comments from the public into the Multi-Hazard Mitigation Plan.

For more information on the planning process, see sections 5 and 6.

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## Section 3 – Olmsted County Profile

This section offers a general overview of Olmsted County to provide a basic understanding of the characteristics of the community, such as the physical environment, population, and the location and distribution of services.

### 3.1 General County Description

Olmsted County is located in southeastern Minnesota, approximately 70 miles southeast of the Twin Cities. To the west lies Dodge County, and to the south are Mower and Fillmore Counties. Goodhue and Wabasha Counties are on the northern border of the county, and to the east is Winona County.

Olmsted County covers 655 square miles (419,200 acres) and the county's estimated population in 2010 was 144,248. Rochester is the county seat and the largest city in the county.

The 8 cities in Olmsted County are Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, Rochester and Stewartville. The 18 townships are Cascade, Dover, Elmira, Eyota, Farmington, Haverhill, High Forest, Kalmar, Marion, New Haven, Orion, Oronoco, Pleasant Grove, Quincy, Rochester, Rock Dell, Salem, and Viola.

The largest employment sector in Olmsted County (2014) is Education and Health Services, with nearly 50% of the county workforce. The percent of the county's population living below the poverty level in 2015 was 9.4%, compared to a 10.2% average for the state of Minnesota.

### 3.2 Environmental Characteristics

Olmsted County has varied topography, with elevations ranging from a high of 1,370' in the southwestern corner of the county to a low of 800' in the river valleys. Large expanses of relatively flat to mildly rolling lands dominate the County's landscape between the river valleys, in the upper reaches of the Root River watershed and in the lower portion of the Zumbro River valley. Steep slopes and bluffs are found along the South Fork Zumbro River, North Fork Root River, and North Fork Whitewater River.

A significant portion of Olmsted County's soils are classified as "highly erodible" based on their tendencies to erode from wind or water movement. Extra care must be taken in these areas to ensure that proper planting and cover techniques are employed to protect the rich topsoil.

Much of Olmsted County has a shallow depth to the water table, providing potential interfaces for contaminants to reach the groundwater, and the potential for localized structure and road damage. Some of these soils are also listed by the USDA as hydric soils, and are indicative of wetlands throughout the County.

Many other areas are characterized by floodplain soils along the perennial rivers and streams, and also along intermittent streams and in depressional areas. They may lead to hazardous and costly damages to adjacent structures and safety concerns for people, especially where flooding is relatively frequent.

### 3.3 Geology

#### 3.3.1 Karst Geology

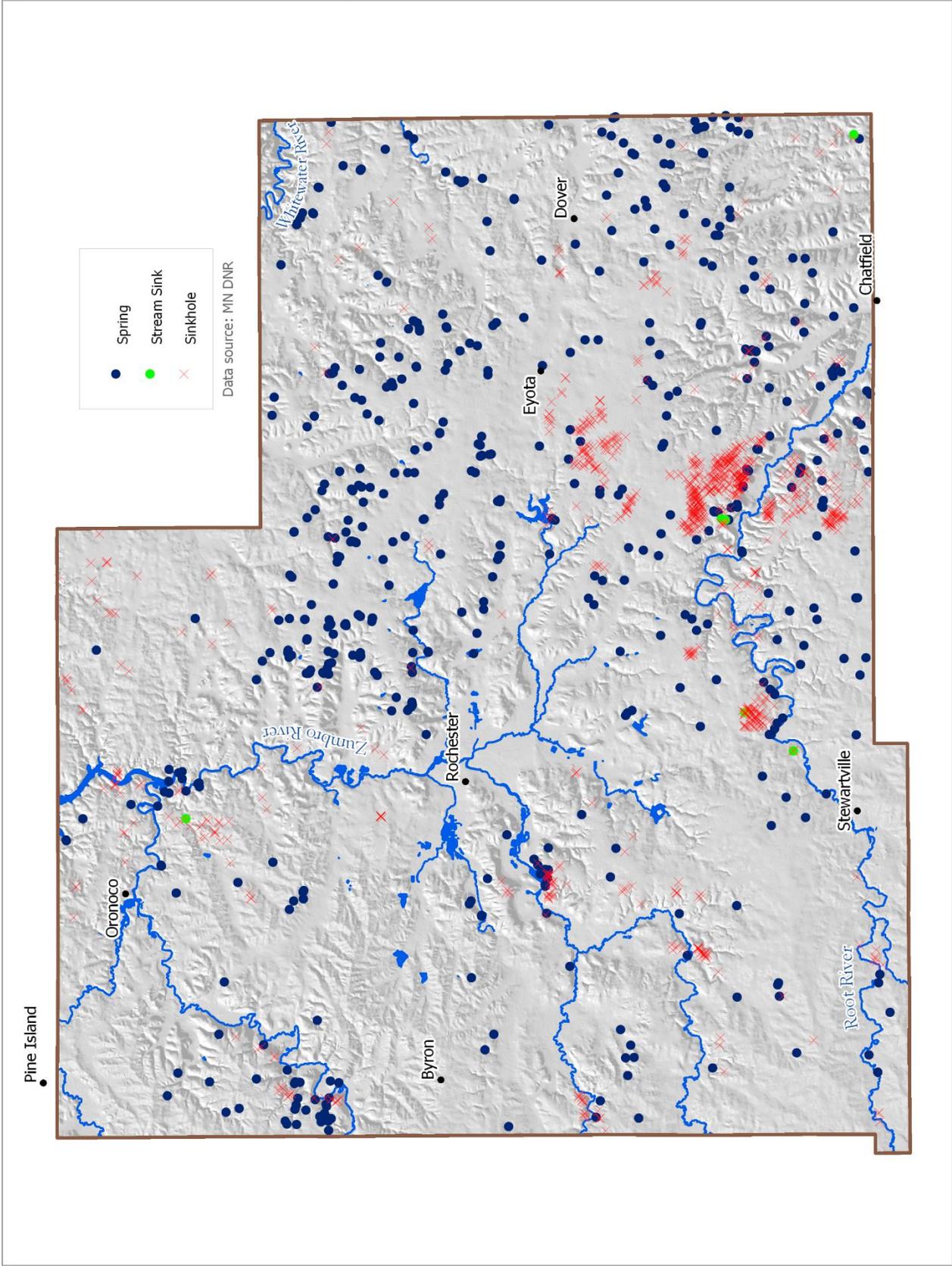
According to the Minnesota Geological Survey, mildly acidic groundwater is slowly dissolving the carbonate bedrock that lies beneath Olmsted County, producing distinctive groundwater conditions and landforms called karst. Karst aquifers are very susceptible to groundwater contamination because fractures in the rock and sinkholes become conduits for pollutants from the surface to the groundwater. This susceptibility is increased by the fact that most of Olmsted County has less than 50 feet of unconsolidated cover.

The Geologic Atlas for Olmsted County (1988) notes that the effects of karst extend over a much greater area than that which is directly underlain by carbonate rock. Groundwater flowing through the karst aquifer eventually moves into lower aquifers and discharges from springs near the bottom of valleys, and into the streams and rivers throughout Olmsted County.

Sinkholes, springs, and stream sinks/sieves are surface manifestations of karst, and occur throughout the county, particularly springs and sinkholes (Figure 1). According to 2006 MN DNR data, the county has 955 sinkholes, 534 springs, and 6 stream sinks. The carbonate rock in various formations is the primary control on sinkhole formation, according to the Geologic Atlas. The distribution of sinkholes is strongly influenced by the presence or absence of at least 50 feet of surficial cover over the carbonate rock. Topographic relief, hydrologic gradient, and water table are secondary controls.

In addition to karst features, improperly constructed or sealed wells may also act as direct routes for surface to groundwater contamination. Protection of these sensitive areas is crucial to the County's health and vitality. Aquifer vulnerability (using 2011 data from the Minnesota Department of Agriculture) and public wells are mapped in Figure A - 14.

Figure 1. Karst Features in Olmsted County



### 3.3.2 *Bedrock Geology*

Rock formations underlying Olmsted County are the major reservoirs for the county's water supply. The St. Peter Sandstone, Prairie du Chien Group (Shakopee Formation and Oneota Dolomite), and Jordan Sandstone provide the bulk of the county's water.

The Decorah – Platteville – Glenwood Formations consisting primarily of shale protect these aquifers from surface and upper aquifer contaminants in many parts of the county. In other areas, however, these drinking water aquifers are the first encountered bedrock formations and do not benefit from this natural protection. Where the Decorah – Platteville – Glenwood Formation is the first-encountered bedrock, it is a highly sensitive area throughout Olmsted County. This sequence of formations is 80 feet thick and hydrologically separated, and is considered a confining unit between the Upper Carbonate aquifer and the underlying St. Peter-Prairie du Chien-Jordan (Middle) aquifer, which provides most of the drinking water for the communities in the county.

Not only does this geologic formation protect against the movement of polluted water from the Upper Carbonate aquifer and streams, at its terminus along stream valleys it is an area of concentrated groundwater recharge where approximately 50% of the annual groundwater recharge from the Upper to the Middle aquifer occurs (about 13 inches/year). In addition, recent studies have shown that the contaminate levels of the Upper Carbonate aquifer water is reduced significantly along this Decorah Edge and before it enters the Middle aquifer.

### 3.4 *Hydrography*

There are three major watersheds in Olmsted County, all of which drain to the Mississippi River: the Zumbro, the Root, and the Whitewater. While there are no natural lakes in Olmsted County, there are a number of reservoirs and manmade lakes controlled by dams. In addition, there are several former and existing sand/gravel mining operations and city stormwater facilities that have created ponds or small lakes within floodplains or along drainageways.

Several cities in Olmsted County are located within the floodplains of the major rivers. In addition, Rochester is located at the base of the steep valleys on an alluvial plain that has made it susceptible to widespread flooding in the past.

Impaired waters are an increasing problem as Olmsted County has many creeks and rivers that are on the Minnesota Pollution Control Agency Impaired Waters lists, including the Zumbro River (south and north branches of the Middle Fork and South Fork), Root River (north branch), Whitewater River (South Fork, Middle Fork and North Fork), Cascade Creek, Silver Creek, Willow Creek, Bear Creek, Robinson Creek, and Mill Creek (Minnesota Pollution Control Agency, 2016). Impaired waters have become a priority issue because they do not meet state water quality standards, they affect growth and health of communities and economies, and the Clean Water Act has a mandate requiring every state to address impairments. Impairments found in Olmsted County waters include fecal coliform, E. coli, mercury in fish tissue, turbidity, and aquatic macroinvertebrate bioassessments.

Basic hydrography in Olmsted County is mapped in Figure A-1 in Appendix A.

### 3.3.1 Lakes

There are no natural lakes in Olmsted County, but reservoirs and manmade lakes controlled by dams do exist. According to the Minnesota DNR, there are 30 water bodies in the county greater than 2 acres in size, the largest of which is Zumbro Lake (715 acres within Olmsted County). These lakes cover approximately 1,602 of the county's 419,200 acres (0.4%).

### 3.3.2 Rivers

Two major rivers flow through Olmsted County: the Zumbro River and the Root River. The 64-mile-long Zumbro River is a tributary of the Mississippi River and a Minnesota State Water Trail. It drains a watershed of 1,429 square miles, and flows north through the city of Rochester. The Root River is also a tributary of the Mississippi River, flowing for 80 miles east of its origin in Mower County. The Root River flows through southern Olmsted County, and through the town of Stewartville, and is a Minnesota State Water Trail as well.

### 3.3.3 Wetlands

Wetlands mapped by the National Wetlands Inventory cover 9,131 acres (14 square miles) in Olmsted County. Important benefits of wetlands include storage area for excess water during flooding; filtering of sediments and nutrients before they enter lakes, rivers and streams; and fish and wildlife habitat.

Wetlands in Olmsted County include 6 types: seasonally flooded basins and flats, wet meadows, shallow marshes, deep marshes, shrub swamps, and wooded swamps (Figure A-1).

Invasive plants have spread throughout many wetlands in Minnesota. These plants can take over entire native communities and threaten wetland ecosystems. Eurasian watermilfoil and zebra mussels have been documented in Olmsted County (MN DNR, 2016).

## 3.5 Climate

The climate of Olmsted County is classified as continental, characterized by wide variations in temperature from summer to winter. Although the climate is essentially uniform throughout the county, variations in microclimate may occur as a result of differences in vegetation, soil and relief.

The average annual precipitation in Rochester is 33 inches and the average annual snowfall is 53 inches. The average high temperature in July is 81° F and the average low in January is 8° F (U.S. Climate Data, 2016).

### 3.4.1 Climate Change

Minnesota's climate is currently changing in ways that affect the environment, economy and everyday life. Historical weather data show changing trends in some weather phenomenon over the past few decades, and future changes are likely. Definite predictions are difficult to make, as changes may vary depending on geographical location, even within Minnesota. Intense study of these topics is ongoing.

According to the 2015 Minnesota Weather Almanac,

*During the three most recent decades, the Minnesota climate has shown some very significant trends, all of which have had many observable impacts...Among the detectable measured quantity*

*changes are: (1) warmer temperatures, especially daily minimum temperatures, more weighted to winter than any other season; (2) increased frequency of high dew points, especially notable in mid- to late summer as they push the Heat Index values beyond 100°F; and (3) greater annual precipitation, with a profound increase in the contribution from intense thunderstorms (Seeley M., 2015).*

Winter temperatures in Minnesota have been warming nearly twice as fast as annual average temperatures, a trend that has been noticed throughout the Midwest. There has also been a distinct spread of warmer lows into the northern portion of the state, and 7 of the top 10 warmest years in Minnesota since record-keeping began in 1895 have occurred within the last 15 years (Minnesota Department of Health, 2015). Various studies have also concluded that the frequency and intensity of precipitation in the Midwest has increased, with more storm events leading to flooding.

Rural communities are particularly vulnerable to climate change, due to their dependence upon natural resources, physical isolation, limited economic diversity, higher poverty rates and aging populations. According to *Climate Change Impacts in the United States: The Third National Climate Assessment*,

*Warming trends, climate volatility, extreme weather events, and environmental change are already affecting the economies and cultures of rural areas. Many rural communities face considerable risk to their infrastructure, livelihoods, and quality of life from observed and projected climate shifts... These changes will progressively increase volatility in food commodity markets, shift the ranges of plant and animal species, and, depending on the region, increase water scarcity, exacerbate flooding and coastal erosion, and increase the intensity and frequency of wildfires across the rural landscape (Hales, et al., 2014).*

The Assessment also notes that transportation systems in rural areas are more vulnerable to risks such as flooding, since there are typically fewer transportation options and infrastructure redundancies. In addition, power and communication outages due to severe weather events typically take longer to repair in rural areas, which can increase the vulnerability of elderly populations. Rural areas are also more vulnerable since they typically have limited financial resources to deal with the effects of climate change.

The composition of the region's forests are expected to change as increasing temperatures shift tree habitats northward. While forests in the Midwest are currently acting as a net absorber of carbon, this could change in the future due to projected increases in insect outbreaks, forest fires, and drought, which will result in greater tree mortality and carbon emissions (Pryor, et al., 2014).

The National Climate Assessment suggests that infrastructure planning (particularly water resources infrastructure) should "be improved by incorporating climate change as a factor in new design standards and asset management and rehabilitation of critical and aging facilities, emphasizing flexibility, redundancy, and resiliency" (Georgakakos, et al., 2014).

Federal, state, and tribal governments are increasingly integrating climate change adaptation into existing decision-making, planning, or infrastructure-improvement processes (Georgakakos, et al., 2014).

### 3.6 Demographics

Rochester is the largest city in Olmsted County (pop. 106,769) and the designated county seat. There are 8 cities and 18 townships within the county.

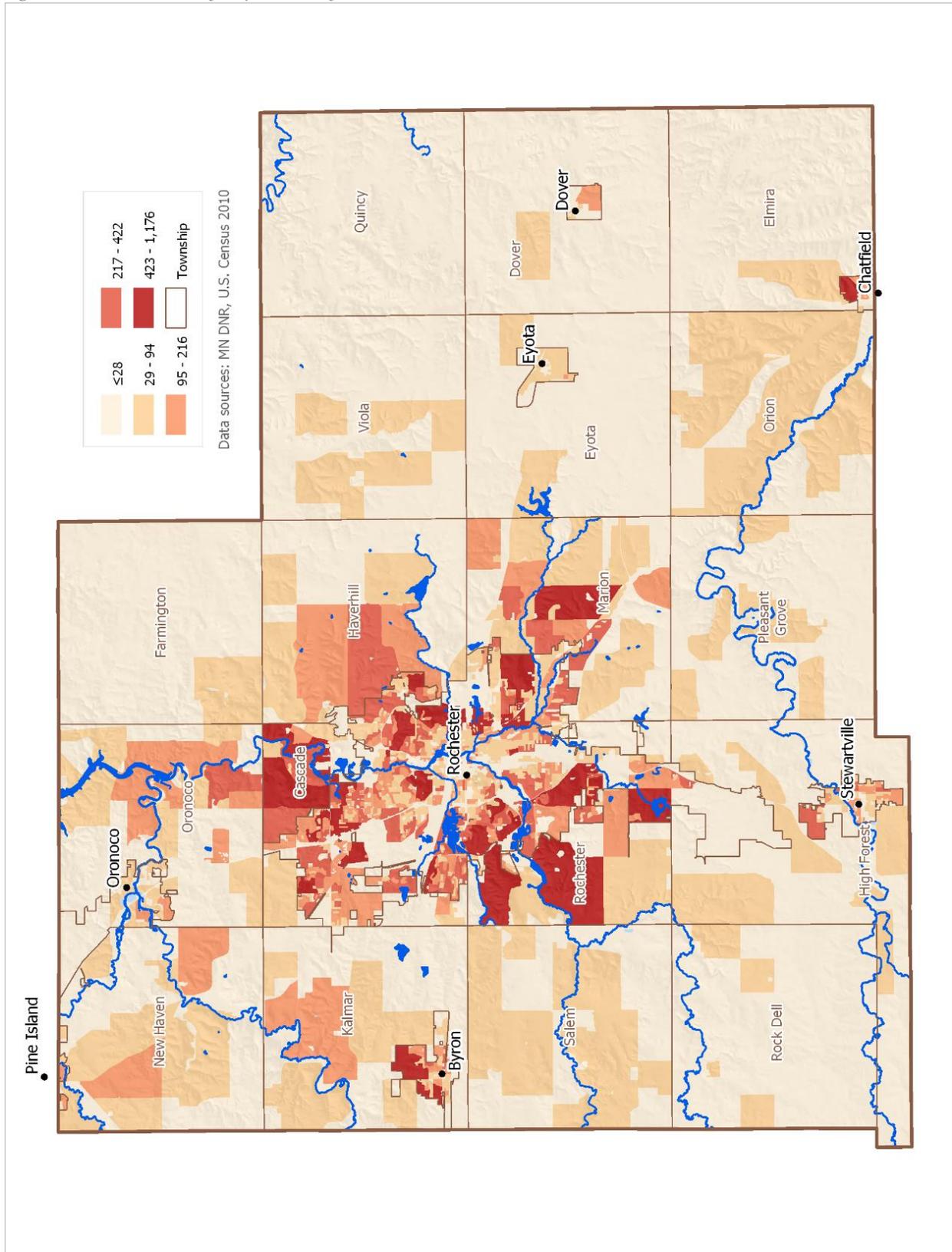
Table 4 summarizes the population by community according to the 2010 U.S. Census. Figure 1 shows Olmsted County population density by census block.

Table 4. Olmsted County Population by Community, 2010

Community	2010 Population	% of County
Byron	4,914	3.41%
Chatfield	1,206	0.84%
Dover	735	0.51%
Eyota	1,977	1.37%
Oronoco	1,300	0.90%
Pine Island	703	0.49%
Rochester	106,769	74.02%
Stewartville	5,916	4.10%
Cascade Township	2,815	1.95%
Dover Township	389	0.27%
Elmira Township	354	0.25%
Eyota Township	464	0.32%
Farmington Township	444	0.31%
Haverhill Township	1,495	1.04%
High Forest Township	976	0.68%
Kalmar Township	1,046	0.73%
Marion Township	3,653	2.53%
New Haven Township	1,184	0.82%
Orion Township	592	0.41%
Oronoco Township	2,220	1.54%
Pleasant Grove Township	806	0.56%
Quincy Township	339	0.24%
Rochester Township	1,629	1.13%
Rock Dell Township	647	0.45%
Salem Township	1,086	0.75%
Viola Township	589	0.41%
<b>Total</b>	<b>144,248</b>	

Source: U.S. Census Bureau, 2015

Figure 2. Olmsted County Population by Census Block, 2010



Population growth trends have an important influence on the needs and demands of a variety of services such as transportation, law enforcement, and emergency response. An understanding of population trends and location of population concentrations is important for making projections regarding potential impacts in the event of a disaster.

In 2010, Olmsted County had a population of 144,248 residents, averaging 220 persons per square mile of land area. Rochester, the largest city in the county and the county seat, had a population of 106,769.

Olmsted County’s population is rapidly increasing, rising 17% between 1990 and 2000, and rising another 16% from 2000 to 2010. Since 1940, the population has risen by 238%. Table 5 below shows the population change in Olmsted County between 1940 and 2010.

Table 5. Olmsted County Population Change (1940-2010)

1940	1950	1960	1970	1980	1990	2000	2010	Change 1940-2010	Change 2000-2010
42,658	48,228	65,532	84,104	92,006	106,470	124,277	144,248	+238%	+16%

Source: U.S. Census Bureau

In 2014, Olmsted County’s population was projected to grow by 29% between 2015 and 2045. Table 6 below shows population projections for Olmsted County until 2045.

Table 6. Olmsted County Population Projections (2015-2045)

2015	2020	2025	2030	2035	2040	2045	Projected Change 2015-2045
152,253	159,331	165,492	170,870	176,333	181,352	185,902	22%

Source: Minnesota State Demographic Center, Minnesota Planning, 2014

### 3.7 Economy

Olmsted County is dominated by the Education and Health Services industry, with 49% of jobs in the county. Trade/Transportation/Utilities and Leisure/Hospitality are also major components of the county’s economy.

The number of jobs in the county rose by nearly 6% between 2004 and 2014. Table 7 provides an overview of the annual average employment by major industry sector in Olmsted County.

Table 7. Annual Average Employment by Major Industry Sector, Olmsted County

Industry	Number of Jobs (2004)	Number of Jobs (2014)
Natural Resources and Mining	164	274
Construction	4,118	3,362
Manufacturing	10,293	7,074
Trade, Transportation, Utilities	13,544	13,729
Information		1,785
Financial Activities	2,346	2,105
Professional /Business Services	5,102	5,060
Education and Health Services	37,285	45,388
Leisure and Hospitality	7,541	8,309
Public Administration	3,071	2,873
Other Services	2,302	2,327
<b>Total Number of Jobs:</b>	<b>87,178</b>	<b>92,288</b>

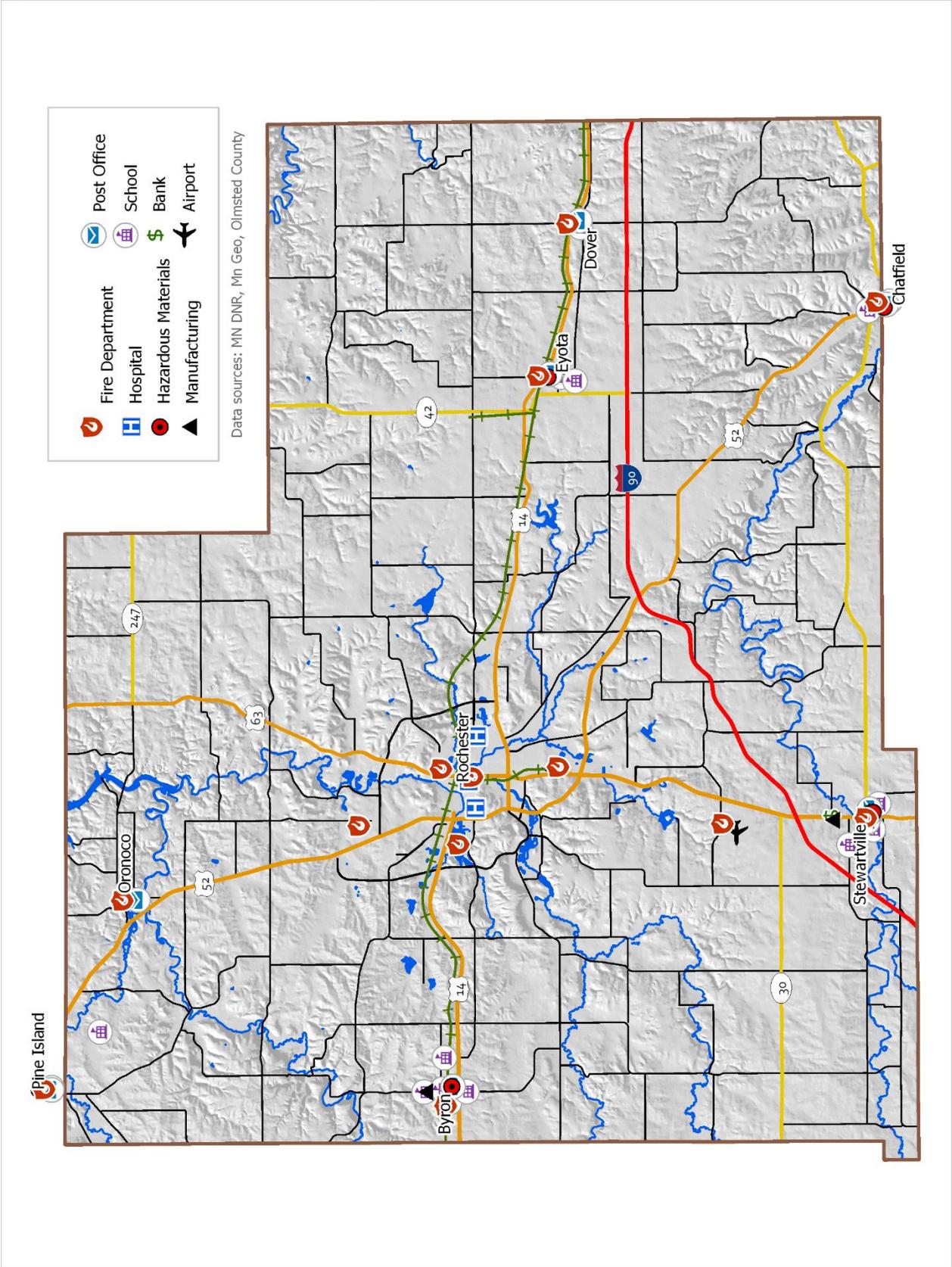
Source: Minnesota Dept. of Employment and Economic Development. Note: data discrepancies between segment values and totals exist due to data suppression for confidentiality.

The 2015 median household income was \$69,973, compared to a Minnesota average of \$63,488. The median household income in Olmsted County increased 9% from 2010 to 2015. The percent of the county's population living below the poverty level in 2015 was 9.4%, compared to a 10.2% average for the state of Minnesota.

### 3.8 Community Services & Infrastructure

The following section provides an overview of community services and infrastructure within Olmsted County. Examples of community services include healthcare and public safety, while examples of community infrastructure include power utilities, water and sewer facilities, and the transportation network. Figure 3 below shows critical facilities in the county, and tables of all critical facilities are located in Appendix B.

Figure 3. Critical Facilities in Olmsted County



### **3.7.1 Health Care Providers**

The Olmsted Medical Center operates clinics in Byron, Chatfield, Pine Island, and Stewartville. Although Rochester has its own Multi-Hazard Mitigation Plan and is not considered a jurisdiction in this plan, it should be noted that the Mayo Clinic Hospital has two locations in Rochester, the Methodist Campus and St. Mary's Campus. The Olmsted Medical Center Hospital is also located in Rochester.

Nursing homes are located in Pine Island and Stewartville, and there are assisted living facilities in Chatfield, Byron, Eyota and Stewartville.

Olmsted County has ambulance services through Chatfield Ambulance, Gold Cross Ambulance (located in Rochester) and Eyota Volunteer Ambulance Service.

Figure A - 13 in Appendix A depicts health services within Olmsted County.

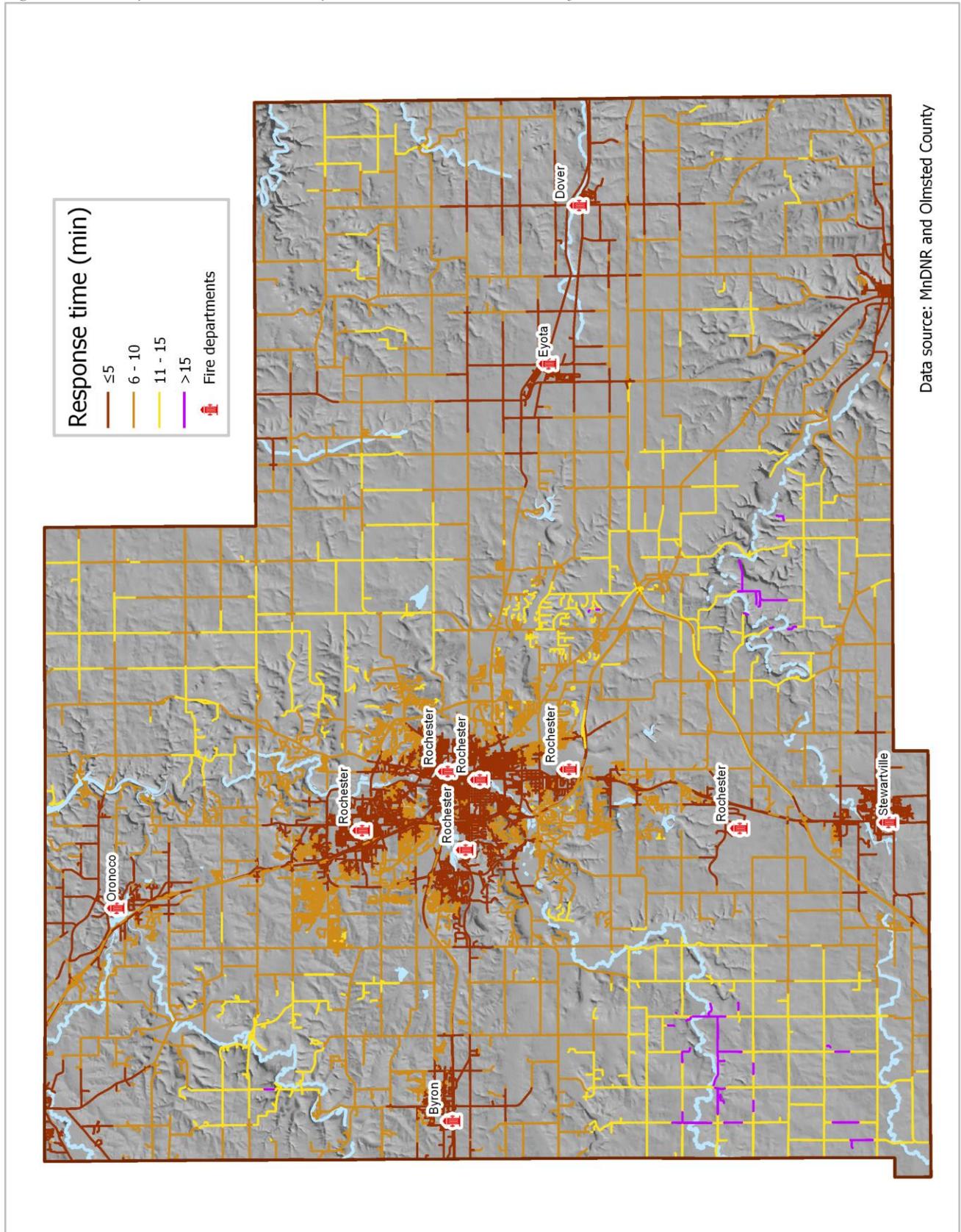
### **3.7.2 Public Safety Providers/Government Services**

The Olmsted County Sheriff's Office is located in Rochester, and it provides contract law enforcement to the cities of Byron, Dover, Eyota, Oronoco and Stewartville.

Figure A - 4 in Appendix A depicts government and emergency facilities, including city halls, fire departments, the sheriff's department, and the Olmsted County Courthouse.

Figure 4 shows fire departments and fire response times in Olmsted County. These drive times were created using the ArcGIS Network Analyst extension and Esri's Business Analyst. The user may note discrepancies between MnDOT road data and the map in this document; Network Analyst requires a seamlessly-connected data source in order to perform the calculations for drive times, which Business Analyst provides but MnDOT does not. The Business Analyst data was used for this reason. According to this model, most of the county is within 15 minutes of a fire department.

Figure 4. Fire Departments and Fire Response Times in Olmsted County



### 3.7.3 Utilities/Communications

The electricity providers within Olmsted County are Rochester Public Utilities, People's Energy Cooperative and Xcel Energy. MN Energy Resources provides natural gas services to Olmsted County.

Established in 2004, the Allied Radio Matrix for Emergency Response (ARMER) Program, administered in coordination with the Minnesota Statewide Radio Board, manages the implementation of a 700/800 megahertz (MHz) shared digital trunked radio communication system. In Olmsted County, there are 4 ARMER towers (see Figure A - 5 in Appendix A).

### 3.7.4 Transportation

Olmsted County has 1,695 highway miles. The Transportation Division is responsible for 512 miles, 337 bridges and is involved with other agencies in all aspects of maintaining the additional 1,183 miles. Assistance is available to all 18 townships for maintenance, construction plan preparation, bridge inspection, bridge replacement and securing funding.

One main railroad line runs east-west through Olmsted County, owned by Canadian Pacific Railway.

Rochester International Airport is a non-hub primary airport located seven miles southwest of the central business district of Rochester. It is served by two air carriers who collectively offer 8 flights each day to Atlanta, Chicago, and Minneapolis. Rochester International Airport typically accommodates about 240,000 passengers each year, providing air service to southeast MN and the border regions of Iowa and Wisconsin.

## 3.9 Land Use and Ownership

Olmsted County covers a total of 655 square miles (419,200 acres). Land in Olmsted County is primarily used for agricultural production. In 2012, 1,150 farms existed in the county, covering 264,407 acres (63% of the county). Of this farming land, 79% is cropland, 7% is woodland, 8% is pastureland, and the rest is classified as "other uses." The number of farms in the county decreased by 17% between 2007 and 2012, while the number of acres farmed decreased by 11%. The average size of each farm increased from 214 acres to 230 acres (Census of Agriculture, 2012).

According to Minnesota DNR data, the number of feedlots in Olmsted County is 690, and 6 of those have more than 1,000 animal units. Feedlots in Olmsted County are mapped in Figure A - 26 (*Appendix A: Olmsted County Maps*).

Agricultural areas in the state such as those in Olmsted County may need to undergo transformative changes to keep pace with climate change, though the country's agricultural system is expected to be fairly resilient overall due to "the system's flexibility to engage in adaptive behaviors such as expansion of irrigated acreage, regional shifts in acreage for specific crops, crop rotations, changes to management decisions (such as choice and timing of inputs and cultivation practices), and altered trade patterns compensating for yield changes" (Hales, et al., 2014).

Land ownership categories from the 2008 U.S. Geological Survey GAP (Gap Analysis Program) are shown in Figure A - 8 (*Appendix A: Olmsted County Maps*). Land cover is mapped in Figure A - 7.

## Section 4 – Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation practices must be based on sound risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people.

Basing risk assessments on the best information available is important in developing affective mitigation actions that benefit communities. Geographic Information System (GIS) tools are not only helpful in producing maps, but they also show structures at risk and may determine damage estimates for potential hazard scenarios. MN Homeland Security and Emergency Management (HSEM) mitigation staff encourages the use of GIS tools in risk assessments because they produce good information to use in the risk assessment process. In recognition of the importance of planning in mitigation activities, FEMA created **Hazards USA Multi-Hazard (Hazus-MH)**, a powerful GIS-based disaster risk assessment tool. This tool enables communities to predict estimated losses from floods, hurricanes and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. Hazus-MH was used by UMD Geospatial Analysis Center staff in the flood hazard risk assessment (see section 4.4.5).

This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components — hazard identification and prioritization, risk profile, and vulnerability profile. The last step is the risk ranking for each jurisdiction.

### 4.1 Hazard Identification/Profile

#### 4.1.1 Hazard Identification

The cornerstone of the risk assessment is identification of the hazards that affect jurisdictions. To facilitate the planning process, several sources were employed to ensure that the natural hazards are identified prior to assessment.

The county maintenance of the plan includes continual updates of the hazards identified in the initial plan. The mitigation steering committee compared the hazards in the initial plan to current publications to determine if new hazards should be considered or if some should be deleted.

Natural hazards are identified in the FEMA publication “Multi-Hazard Identification and Risk Assessment – A Cornerstone of the National Mitigation Strategy,” also known as MHIRA. FEMA Region V developed a list based on state mitigation plans in the region. The list was divided into natural (Table 8) and other hazards (Table 9) as was done in the 2014 Minnesota State Hazard Mitigation Plan.

Table 8. FEMA MHIRA Natural Hazards in the 2014 Minnesota State Hazard Mitigation Plan

Flooding	Hail	Drought
Dam/Levee Failure	Lightning	Extreme Heat
Wildfire*	Winter Storms	Extreme Cold
Windstorms	Erosion	Earthquakes
Tornadoes	Land Subsidence (Sinkholes & Karst)	

\*Addressed in the State Mitigation Plan because Minnesota is a heavily forested state compared to other states in Region V.

For the purpose of this plan, FEMA defines other hazards or “man-made hazards” as technological hazards and terrorism. These are distinct from natural hazards primarily in that they originate from human activity. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced. The term “technological hazards” refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the sake of simplicity, this guide assumes that technological emergencies are accidental and that their consequences are unintended. The term “terrorism” refers to intentional, criminal, and malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. For the purposes of this plan, FEMA refers to “terrorism” as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and “cyber terrorism.”

Table 9. FEMA MHIRA Other Hazards in the 2014 Minnesota State Hazard Mitigation Plan

Terrorism	Nuclear Generating Plant Incidents	Ground and Surface Water Supply Contamination*
Infectious Disease Outbreak	Hazardous Materials Incidents	
Fires (Structures and Vehicles)	Transportation Incidents	

\*Addressed in the State Hazard Mitigation Plan because Minnesota has made a high investment in its prized resource, water.

#### 4.1.2 Vulnerability Assessment by Jurisdiction

The steering committee met multiple times to review and update the hazards faced by residents of Olmsted County, update the existing mitigation actions published in the 2009 Multi-Hazard Mitigation Plan, and propose new mitigation actions.

To engage in this process, the committee drew on a number of data sources. First, the committee examined the hazards identified in the 2009 Hazard Mitigation Plan (Table 10). The natural hazards that pose risk to Olmsted County were discussed and adjusted to reflect the definitions of natural hazards used in the 2014 Minnesota State Hazard Mitigation Plan. This was done in order to assure that the risks faced by Olmsted County were categorized the same way as the priority hazards established by the State of Minnesota.

Table 10. Hazards identified in the 2009 Olmsted County Multi-Hazard Mitigation Plan

Natural Hazards			
Drought	Earthquakes	Extreme Temperatures	Floods
Severe Storms (Thunderstorms, Lightning, Hail, Windstorms, Tornadoes, Snow/Ice)	Wildfire	Karst – Subsidence and Landslides	
Technological Hazards			
Hazardous Materials/Waste	Dam Failure	Water Supply and Wastewater Treatment	Terrorism
Fire	Infectious Diseases		

While the focus of this MHMP is on natural hazards, planning took place with the understanding that many non-natural hazards could occur as a result of natural disasters (i.e. disruption in electrical service due to freezing rain causing problems for both utility corporations and vulnerable populations dependent on electricity for heat).

This plan draws on a variety of data sources including the State of Minnesota and Homeland Security Emergency Management Critical Infrastructure Strategy for the State of Minnesota (2010), FEMA’s Local Mitigation Planning How-to Guide Integrating Manmade Hazards into Mitigation Planning (2003), and the State of Minnesota Multi Hazards Identification Risk Assessment.

Olmsted County ranked hazards based on a Calculated Priority Risk Index, or CPRI, for their 2014 Threat Hazard Identification and Risk Assessment (THIRA). These rankings were considered by the steering committee in the process of ranking hazards for the MHMP update. The methodology of the CPRI is outlined below.

**4.1.3 Calculated Priority Risk Index**

The vulnerability assessment builds upon the previously developed hazard information by identifying the community assets and development trends and intersecting them with the hazard profiles to assess the potential amount of damage that could be caused by each hazard event. A summary of Calculated Priority Risk Index (CPRI) categories and risk levels is shown in Table 11.

*Definitions of CPRI Categories*

Probability – a guide to predict how often a random event will occur. Annual probabilities are expressed between 0.001 or less (low) up to 1 (high). An annual probability of 1 predicts that a natural hazard will occur at least once per year.

Magnitude/Severity – indicates the impact to a community through potential fatalities, injuries, property losses, and/or losses of services. The vulnerability assessment gives information that is helpful in making this determination for each community.

Warning Time – plays a factor in the ability to prepare for a potential disaster and to warn the public. The assumption is that more warning time allows for more emergency preparations and public information.

Duration – relates to the actual amount of time that an incident may take place over time.

Table 11. Summary of Calculated Priority Risk Index (CPRI) Categories and Risk Levels

CPRI Category	DEGREE OF RISK			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 0.001	1	45%
	Possible	Rare occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.01 and 0.001.	2	
	Likely	Occasional occurrences with at least two or more documented historic events. Annual probability that is between 0.1 and 0.01.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability that is greater than 0.1.	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost. Shutdown of critical facilities for less than 24 hours.	1	30%
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost. Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.	4	
Warning Time	Less than 6 hours	Less than 6 hours	4	15%
	6 to 12 hours	6 to 12 hours	3	
	12 to 24 hours	12 to 24 hours	2	
	More than 24 hours	More than 24 hours	1	
Duration	Brief	Up to 6 hours	1	10%
	Intermediate	Up to 1 day	2	
	Extended	Up to 1 week	3	
	Prolonged	More than 1 week	4	

The hazard rankings for the Olmsted County MHMP update (Table 12) were based upon review of 1) hazard rankings in the past MHMP, 2) hazard rankings in the Calculated Priority Risk Index (CPRI) conducted by the county, and 3) group review and discussion during the MHMP steering committee meetings and public meetings.

Table 12. Hazard Ranking for 2017 MHMP Update

Natural Hazards	MHMP Hazard Ranking
Flash Flooding & Riverine Flood	High
Severe Winter Storms	High
Severe Summer Storms (Thunderstorms, Lightning, Hailstorms, Windstorms, Tornadoes)	Moderate
Extreme Heat/Extreme Cold	Moderate
Erosion/Land Subsidence	Moderate
Drought	Low
Dam Failure	Low
Wildfire	Low

**4.1.4 Hazard Profiling Concept of Planning**

The risk assessments identify the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of 3 components—hazard identification, risk profile, and vulnerability profile.

**4.1.5 GIS and Risk Assessment**

The risk analysis step in this assessment quantifies the risk to the population, infrastructure, and economy of the community. Hazards that can be geographically identified (wildland fires, windstorms, tornadoes, hail, floods) were mapped.

Hazus-MH was used to estimate the damages incurred for a 100-year flood and for general asset assessment. Hazus-MH also generates aggregated loss estimates for the entire county due to a 100-year flood. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across each census block. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas (groups of many blocks) than for individual census blocks. It is important to note that Hazus-MH is not intended to be a substitute for detailed engineering studies.

**4.1.6 National Centers for Environmental Information (NCEI) Records**

Historical storm event data was compiled from the National Centers for Environmental Information (NCEI). NCEI records are estimates of damage reported to the National Weather Service (NWS) from

various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events.

The NCEI data included 730 reported events in Olmsted County between 1950 and 2016. However, some weather event categories only had available data going back as recent as 1996. No records before 1950 were available. A summary table of events related to each hazard type is included in the hazard profile sections that follow. A full table listing all events, including additional details, is included in Appendix C. NCEI hazard categories used in this plan are listed in Table 13.

*Table 13. National Centers for Environmental Information Historical Hazards*

Hazard	
Tornado	Hail
Thunderstorm Wind	Flood/Flash Flood
Winter Weather/ Winter Storm/Blizzard	Cold/Wind Chill
Excessive Heat/Heat	Lightning

#### **4.1.7 FEMA Declared Disasters**

Another historical perspective is derived from FEMA-declared disasters. 10 major disaster and 2 emergency declarations in Olmsted County have been made between 1957 and 2016 (Figure 5).

Figure 5. FEMA-Declared Disasters and Emergencies in Minnesota, 1957-2016

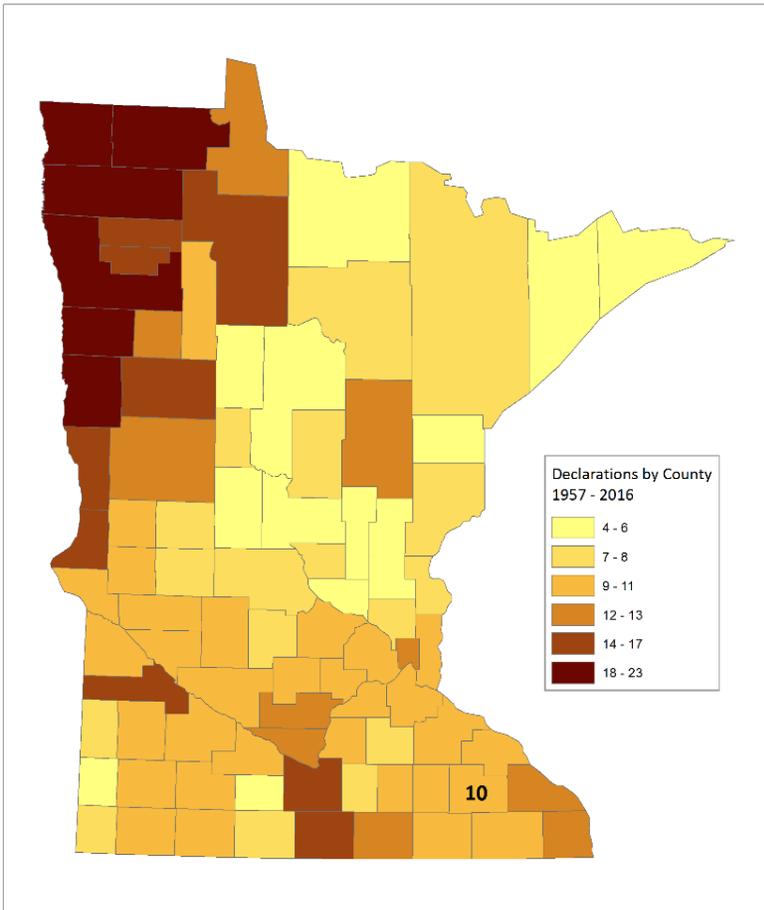


Table 14 and Table 15 show the details of the disasters including payments for Public Assistance (PA) and Individual Assistance (IA), listed under the flooding and severe storm profiles. No declarations were made for the other storms listed in the NCEI database. Reviewing the federal payments for damages from the declared disasters is a way of correlating the impact from the NCEI report.

Table 14. FEMA-Declared Major Disasters in Olmsted County (1953-2016)

Incident	Declaration Date and Disaster Number	Incident Period	Total PA Obligated by FEMA for Disaster in Minnesota	Total PA Obligated by FEMA for Disaster in Olmsted County	Individual Assistance in Minnesota	Individual Assistance in Olmsted County
Severe Storms, Flooding	10/13/2010 DR-1941	9/22/2010 – 10/13/2010	\$33,453,783	\$757,852	None	None
Severe Storms, Tornadoes, Flooding	7/2/2010 DR-1921	6/17/2010 – 6/26/2010	\$17,728,370	\$137,637	None	None
Severe Storms, Flooding	8/23/2007 DR-1717	8/18/2007 – 8/31/2007	\$39,751,469	\$1,768,376	\$19,808,888	\$2,225,221
Severe Storms, Flooding	10/7/2004 DR-1569	9/14/2004 – 9/27/2004	\$5,016,667	None	\$4,210,930	\$49,715

Incident	Declaration Date and Disaster Number	Incident Period	Total PA Obligated by FEMA for Disaster in Minnesota	Total PA Obligated by FEMA for Disaster in Olmsted County	Individual Assistance in Minnesota	Individual Assistance in Olmsted County
Flooding	5/16/2001 DR-1370	3/23/2001 – 7/3/2001	\$32,888,901	None	Yes, amount unknown	Yes, amount unknown
Severe Storms, Straight-line Winds, Tornadoes	6/23/1998 DR-1225	5/15/1998 – 6/28/1998	Yes, amount unknown	Yes, amount unknown	None	None
Ice Storm	12/26/1991 DR-929	10/31/1991 – 11/29/1991	Yes, amount unknown	Yes, amount unknown	None	None
Severe Storms, Tornadoes, Hail, Flooding	7/8/1978 DR-560	7/8/1978	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown
Severe Storms, Flooding	7/13/1974 DR-446	7/13/1974	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown
Flooding	4/11/1965 DR-188	4/11/1965	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown	Yes, amount unknown

\* Data provided by MN HSEM in September 2016, and <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1> accessed February 2017. Values are estimates collected at the time of the disaster.

Table 15. FEMA-Declared Emergencies in Olmsted County (1974-2016)

Incident	Declaration Date and Disaster Number	Incident Period	Individual Assistance in Minnesota	Public Assistance (all affected areas)
Hurricane Katrina Evacuation	9/13/2005 EM-3242	9/29/2005 – 10/1/2005	None	None
Drought	6/17/1976 EM-3013	6/17/1976	None	Unknown

\*Note the Public Assistance totals are for ALL counties affected in the disaster. Data accessed October 10, 2016 at <https://www.fema.gov/disasters>

Table 16 depicts the historical projects in Olmsted County resulting from hazard mitigation funding.

Table 16. Historical Hazard Mitigation Funding (HMGP and PDM) in Olmsted County

Year	Project Description	Sub-Grantee	Federal Share
2015	Property Acquisition	City of Oronoco	\$42,200
2015	Property Acquisition	City of Oronoco	\$388,200
2012	Local Multi-Hazard Mitigation Plan	City of Rochester	\$80,000
2012	Quarry Hill Nature Center Community Safe Room	City of Rochester	\$619,660
2010	Property acquisition of 5 single family homes and conversion to green space	City of Oronoco	\$542,550

Year	Project Description	Sub-Grantee	Federal Share
2010	Property acquisition of 4 residential properties and conversion to green space	City of Pine Island	\$198,724
2007	Local Multi-Hazard Mitigation Plan	Olmsted County	\$74,140
1997	Installation of living snow fence by Marion Rest Area	MN DOT District 6A	\$169,000
1996	Installation of living snow fence	MN DOT District 6A	\$106,392
<b>Total HMGP/PDM Funding – Olmsted County</b>			<b>\$2,220,866</b>

\*Data downloaded from <https://www.fema.gov/media-library/assets/documents/28323> and <https://www.fema.gov/media-library/assets/documents/103341> on 2/20/2017.

## 4.2 Vulnerability Assessment

### 4.2.1 Asset Inventory

A 2010 essential facility dataset (schools, medical facilities, fire stations, and police stations compiled from state and county sources) was used to override the default Hazus-MH input database. Other critical facilities identified by the county were geocoded and overlaid with the Hazus-MH flood model output.

For the purposes of this plan, critical infrastructure and key resources were defined by Olmsted County. Table 17 below identifies the critical facilities that were included in the analysis. Essential facilities are a subset of critical facilities. Names and locations of all critical facilities are found in Appendix B. Figure 6 below maps the critical facilities in Stewartville, while Figure 7 depicts critical facilities in Byron.

Table 17. Olmsted County Critical Infrastructure and Facilities

Infrastructure Type	Number of Facilities
Agriculture and Food	20
Banking and Finance	9
Chemical and Hazardous Materials	5
Commercial Facilities	39
Communications	2
Dams	19
Defense Industrial Base	0
Emergency Services	9
Energy	5

Infrastructure Type	Number of Facilities
Government Facilities	38
Healthcare and Public Health	14
Information Technology	0
Manufacturing	3
National Monuments and Icons	0
Nuclear	0
Postal and Shipping	8
Transportation	5
Water	13

Figure 6. Critical Facilities in Stewartville

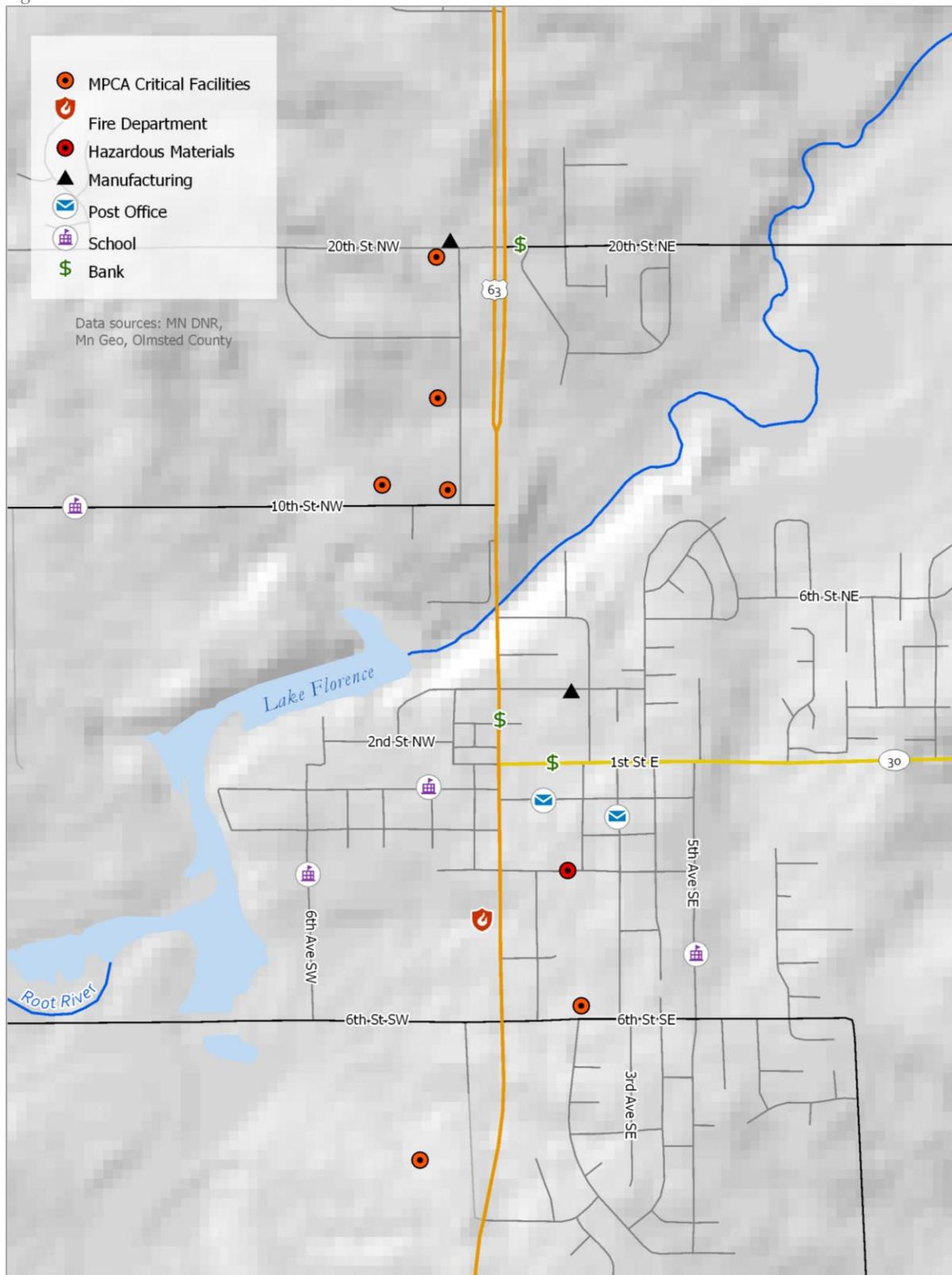


Figure 7. Critical Facilities in Byron



#### 4.2.2 Facility Replacement Costs

Olmsted County-specific building data was sourced from the parcel tax databases and parcel polygon data included building valuations and occupancy class. Structure values for each parcel were aggregated within each parcel and assigned to the parcel centroid point. Records were aggregated to the relevant census administrative boundaries for the flood hazard analysis.

Facility replacement costs and total building exposure by general occupancy class are identified in Table 18, as calculated by Hazus.

Table 18. Olmsted County Total Building Exposure

General Occupancy	Parcels Containing Structures	Total Building Exposure
Agriculture	2195	\$131,720,000
Commercial	1,682	\$2,462,099,000
Education	80	\$519,977,000
Government	250	\$381,904,000
Industrial	127	\$92,918,000
Religious/Non-Profit	297	\$268,199,000
Residential	45,979	\$8,324,934,000
<b>Total:</b>	<b>50,610</b>	<b>\$12,181,751,000</b>

#### 4.3 Future Development

Because Olmsted County is vulnerable to a variety of natural hazards, the county government—in partnership with the state government—must make a commitment to prepare for the management of these events. Olmsted County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

There have not been any changes in development, settlement patterns, and commercial land use patterns in Olmsted County since the last Multi-Hazard Mitigation Plan.

The Olmsted County Emergency Management Director will work to keep the jurisdictions covered by the Multi-Hazard Mitigation Plan engaged and informed during the plan's cycle. By keeping jurisdictional leaders involved in the monitoring, evaluation and update of the MHMP, they will keep their local governments aware of the hazards that face their communities and how to mitigate those hazards through planning and project implementation. Each jurisdiction has identified mitigation strategies they will seek to implement in their communities (see *Appendix G: Mitigation Actions by Jurisdiction*). Jurisdictions will include considerations for hazard mitigation in relation to future development when updating local comprehensive plans or other plans that may influence development.

## 4.4 Hazard Profiles

### 4.4.1 Tornadoes

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms to the ground, with wind speeds between 40-300 mph. They develop under 3 scenarios: (1) along a squall line; (2) in connection with thunderstorm squall lines during hot, humid weather; and (3) in the outer portion of a tropical cyclone. Funnel clouds are rotating columns of air not in contact with the ground; however, the column of air can reach the ground very quickly and become a tornado.

Since 2007, tornado strength in the United States is ranked based on the Enhanced Fujita scale (EF scale), replacing the Fujita scale introduced in 1971. The EF scale uses similar principles to the Fujita scale, with 6 categories from 0-5, based on wind estimates and damage caused by the tornado. The EF Scale is used extensively by the NWS in investigating tornadoes (all tornadoes are now assigned an EF Scale number), and by engineers in correlating damage to buildings and techniques with different wind speeds caused by tornadoes. To see a comparative table of F and EF scales, see <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

Figure 8. Rochester Tornado in June 2010 (WXOW, 2010)



In Minnesota, the peak months of tornado occurrence are June and July. The typical time of day for tornadoes in Minnesota ranges between 4:00 p.m. and 7:00 p.m. Most of these are minor tornadoes, with wind speeds under 125 miles per hour. A typical Minnesota tornado lasts approximately 10 minutes, has a path length of 5 to 6 miles, is nearly as wide as a football field, has a forward speed of about 35 miles an

hour, and affects less than 0.1% of the county warned.

### Tornado History in Olmsted County

According to the NCEI, 30 tornadoes were reported in Olmsted County between 1950 and 2016, causing 1 death, 45 injuries, and \$35 million dollars in property damage. Tornado classification ranged from Fo/F<sub>4</sub> to F<sub>2</sub> on the Fujita Scale. The most recent tornadoes occurred in 2010, one of which resulted in nearly \$2 million damage. During that tornado, 127 homes in Rochester were damaged, and due to a computer glitch, no warning sirens were sounded (WXOW, 2010). Figure 9 below shows tornado touchdown points and tracks in Olmsted County from 1950-2016. Historic tornado events in the county are listed in Table 19.

Table 19. Historic Tornado Events in Olmsted County, 1950-2016

Location or County	Date	Magnitude	Deaths	Injuries	Property Damage
Rock Dell	8/13/2010	EF0	0	0	0
Rochester	6/17/2010	EF1	0	0	\$1,900,000
Stewartville	5/1/2001	F0	0	0	0
Byron	6/24/1998	F0	0	0	0
Eyota	5/15/1998	F1	0	0	\$50,000
Rochester	8/13/1995	F0	0	0	\$70,000
Olmsted Co.	6/7/1984	F1	0	0	\$250,000
Olmsted Co.	5/17/1982	F0	0	0	\$25,000
Olmsted Co.	4/29/1981	F2	0	2	\$2,500,000
Olmsted Co.	4/29/1981	F0	0	0	0
Olmsted Co.	4/29/1981	F0	0	0	\$2,500
Olmsted Co.	6/5/1980	F1	0	0	\$250,000
Olmsted Co.	7/3/1979	F2	0	0	\$2,500,000
Olmsted Co.	6/18/1974	F1	0	2	\$25,000
Olmsted Co.	6/9/1974	F1	0	0	\$2,500
Olmsted Co.	9/26/1973	F1	0	1	\$25,000
Olmsted Co.	6/7/1971	F0	0	0	0
Olmsted Co.	6/7/1971	F0	0	0	\$2,500
Olmsted Co.	4/30/1967	F2	0	0	\$25,000,000
Olmsted Co.	6/25/1966	F0	0	0	\$25,000
Olmsted Co.	5/25/1964	F0	0	0	\$25,000
Olmsted Co.	4/13/1964	F2	0	0	\$250,000
Olmsted Co.	10/4/1962	F0	0	0	0
Olmsted Co.	9/16/1962	F4	0	34	\$250,000
Olmsted Co.	9/16/1962	F2	0	0	\$25,000
Olmsted Co.	6/17/1962	F1	0	0	\$25,000
Olmsted Co.	5/22/1962	F0	0	0	0
Olmsted Co.	5/22/1962	F2	0	0	\$25,000
Olmsted Co.	6/30/1956	F0	0	0	0
Olmsted Co.	5/10/1953	F4	1	6	\$2,500,000

Source: National Centers for Environmental Information



## Tornadoes and Climate Change

Tornadoes and other severe thunderstorm phenomena frequently cause as much annual property damage in the U.S. as do hurricanes, and often cause more deaths. Although recent research has yielded insights into the connections between global warming and the factors that cause tornados and severe thunderstorms, such as atmospheric instability and increases in wind speed with altitude (Del Genio, Yao, & Jonas, 2007), these relationships remain mostly unexplored, largely because of the challenges in observing thunderstorms and tornados and simulating them with computer models (National Climate Assessment Development Advisory Committee, 2013).

According to Harold Brooks of NOAA's National Severe Weather Laboratory, there is increasing variability in the "start" of tornado season. The number of days with more than 30 EF1 or greater tornados is increasing, while the number of days with at least 1 EF1 or greater tornados is decreasing. Thus, tornados are occurring on fewer days, but *more* are occurring on outbreak days.

Tornadoes have not been recorded in Minnesota in the winter months of December, January and February (MN DNR, 2014). However, the state of Wisconsin has recorded 3 tornadoes in January and 6 in December during the period of 1844-2013 (National Weather Service Weather Forecast Office, 2014) including a recent January tornado in 2008.

## Vulnerability

The county has experienced tornadoes in 18 of the 66 years on record. According to these statistics, there is a 27% chance of a tornado affecting Olmsted County each year. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Olmsted County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*SKYWARN Program* – All of the cities within Olmsted County attend SKYWARN training, which is held every spring. All cities provide information to citizens from the information that is relayed to them from the NWS. The cities of Eyota and Dover are the only cities within Olmsted County that are StormReady.

*Severe Weather Awareness Week* – Olmsted County participates in this and sends updates through email, Facebook and Twitter, and has conducted presentations for the community.

*Outdoor Warning Systems* – Olmsted County has 91 emergency warning sirens throughout the county, which are activated anytime there is a tornado warning or winds measured at 70 MPH or greater. The sirens are tested weekly.

*Storm Shelters* – Trailer Parks in Stewartville and Oronoco have access to safe rooms. The schools can be considered storm shelters if applicable. Oxbow Park and Chesterwoods Park have safe rooms and other county parks have storm shelters, which are the concrete bathrooms. Storm shelter and safe room locations include:

- Oronoco Estates – Located in the trailer park as soon as you drive in off 85<sup>th</sup> St NW and was built to FEMA standards for a safe room.
- Sistad Trailer Park – Located in the trailer park off 5<sup>th</sup> St SE and is a storm shelter.
- Southern Hills – There is one storm shelter located in the trailer park and is located off 23<sup>rd</sup> Ave. The other is constructed as a safe room and built to FEMA standards. This safe room is located off 21<sup>st</sup> St near the pool.
- Zumbro Ridge – Located in the trailer park as soon as you drive in from 55<sup>th</sup> St NE and is a storm shelter.
- Hallmark Terrace – Located in the trailer park and is a storm shelter.
- Chester Woods Park and Oxbow Park – both are equipped with safe rooms built to FEMA standards.

### Program Gaps and Deficiencies

*Storm Shelters* – The Eyota Trailer Park does not have a designated storm shelter/safe room as each lot is owned by the individual. City parks in the City of Byron and the trailer park in the City of Dover do not have storm shelters.

*Safe Rooms* – Zumbro Ridge, Hallmark Terrace, and Sistad Trailer Park are not equipped with safe rooms. These trailer parks, along with schools and public parks that do not have shelters, should be evaluated for construction or retrofit of a safe room as appropriate.

*Backup Power* – Not all government buildings have backup power generators, such as the schools in Olmsted County.

*NWS StormReady Program* – The Cities of Pine Island, Oronoco, Byron, Chatfield and Stewartville are not currently StormReady.

#### 4.4.2 Windstorms

FEMA defines winds in excess of 58 miles per hour, excluding tornadoes, as windstorms. Straight-line winds and windstorms are used interchangeably in the plan. This hazard is treated as a different category than tornadoes (which may also include high winds). Windstorms are among the nation's most severe natural hazards in terms of both lives lost and property damaged.

Severe winds can damage and destroy roofs, toss manufactured homes off their pier foundations, and tear light-framed homes apart. There are several different types of windstorms. A "downburst" is

defined as a strong downdraft with an outrush of damaging winds on or near the earth's surface. Downbursts may have wind gusts up to 130 mph and are capable of the same damage as a medium-sized tornado. A "gust front" is the leading edge of the thunderstorm downdraft air. It is most prominent near the rain-free cloud base and on the leading edge of an approaching thunderstorm and is usually marked by gusty, cool winds and sometimes by blowing dust. The gust front often precedes the thunderstorm precipitation by several minutes. Straight-line winds, when associated with a thunderstorm, are most frequently found with the gust front. These winds originate as downdraft air reaches the ground and rapidly spreads out, becoming strong horizontal flow.

### Windstorm History in Olmsted County

Olmsted County frequently experiences winds blowing at over 50 knots. According to NCEI records there have been 248 thunderstorm/high wind events reported between 1950 and 2016, with wind speeds of up to 85 knots. These winds can inflict damage to buildings and in some cases overturn high-profile vehicles.

Severe thunderstorms in August of 2013 resulted in winds that damaged several homes and trees in Eyota. Some of the trees landed on power lines and houses, and garage windows were blown out and a fence collapsed over part of U.S. Highway 14. The NCEI damage estimate in Eyota was \$10,000.

Another storm in September of 2012 produced damaging winds that were particularly severe in Rochester, where over 175 trees blew down and nearly 5,000 customers lost power. Numerous homes and cars were damaged due to the falling trees, and power lines were blown over or came down with the fallen trees. The NCEI damage estimate for Rochester was \$500,000.

A storm in June of 2012 produced a wind gust of 62 miles per hour on the northwest side of Rochester, and a barn roof was damaged near Byron, resulting in \$12,000 in damages.

*Figure 10. A wind storm topples grain bins in Byron, March 2012 (Post Bulletin, 2012)*



In March of 2012 severe storms produced high winds which ripped the lids off four 50,000-bushel galvanized steel bins and pushed them over (Figure 10). An empty 30,000-gallon fuel tank was also toppled, and some grain semi-trailers

were also damaged when the bins landed on them. NCEI property damage estimates equaled \$800,000.

In August of 2010, numerous trees blew down throughout the city of Stewartville. In addition, two mobile homes were significantly damaged by uprooted trees in the Southern Hills Mobile Home Community. NCEI damages recorded totaled \$20,000.

The most recent severe wind and hail storms in Olmsted County are shown in Figure 11.



## Windstorms and Climate Change

Lack of high-quality long-term data sets make assessment of changes in wind speeds very difficult (Kunkel, et al., 2013). One analysis generally found no evidence of significant changes in wind speed distribution. Other trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

## Vulnerability

The magnitude of summer storms each year is unpredictable and within Olmsted County and the vulnerability of jurisdictions to windstorms does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

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- Chester Woods Park and Oxbow Park – both are equipped with safe rooms built to FEMA standards.

### Program Gaps and Deficiencies

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#### 4.4.3 Lightning

Lightning typically occurs as a by-product of a thunderstorm. In only a few millionths of a second, the air near a lightning strike is heated to 50,000° F, a temperature hotter than the surface of the sun. The hazard posed by lightning is significant. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. Lightning can strike more than 10 miles from the storm in an area with clear sky above.

Lightning strikes the ground approximately 25 million times each year in the U.S. According to the NWS, the chance of an individual in the U.S. being killed or injured by lightning during a given year is 1 in 240,000 (NOAA National Severe Storms Laboratory, n.d.).

Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent killer in the U.S., behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. The lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. In addition, an electrical current may be conducted through the ground to a person after lightning strikes a nearby tree,

antenna, or other tall object. The current may also travel through power lines, telephone lines, or plumbing pipes to damage property or cause fires.

### Lightning History in Olmsted County

The NCEI has recorded 18 lightning events in Olmsted County since 1999, but no deaths or injuries were reported. These lightning strikes did result in nearly \$2 million in property damage. The most recent event occurred in September of 2016 when lightning started a house on fire on the southeast side of Rochester. The fire was contained to the attic, with the house sustaining moderate damage (the NCEI property damage estimate was \$30,000).

### Lightning and Climate Change

The projected possible intensity and frequency of tornadoes, hail, and damaging thunderstorm winds, the conditions associated with lightning, are uncertain (National Climate Assessment Development Advisory Committee, 2013). Severe rain events are becoming more common and may include an additional risk of lightning.

### Vulnerability

The magnitude of summer storms each year is unpredictable and within Olmsted County the vulnerability of jurisdictions to lightning does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

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### Program Gaps and Deficiencies

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#### 4.4.4 Hail

Hailstorms are a product of severe thunderstorms. Hail forms when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger, until their weight can no longer be supported by the winds. Hailstones can vary in size, depending on the strength of the updraft. The NWS uses the following descriptions when estimating hail sizes: pea size is ¼-inch, marble size is ½-inch, dime size is ¾-inch, quarter size is 1-inch, golf ball size is 1 ¾-inches, and baseball size is 2 ¾-inches. Individuals who serve as volunteer “storm spotters” for the NWS are located throughout the state, and are instructed to report hail dime size (¾-inch) or greater. Hailstorms can occur throughout the year; however, the months of maximum hailstorm frequency are typically between May and August. Although hailstorms rarely cause injury or loss of life, they can cause significant property damage.

### Hail History in Olmsted County

Hail is a particular concern in Olmsted County due to the damage it can inflict on agriculture. According to the NCEI, only one hailstorm since 2010 resulted in property damage. The storm occurred in August of 2014 on the northern edge of Olmsted County. Golf ball sized hail fell, causing vehicular damage. However, the NCEI has recorded a total of over \$6.2 million in property damage due to hail since 1950, and another \$400,000 of crop damage.

Table 20 shows storms producing hail greater than 1 inch diameter in Olmsted County.

Table 20. Storms producing hail of greater than 1-inch diameter in Olmsted County, 1950-2016

Date	Hail Size (inches)	Injuries	Date	Hail Size (inches)	Injuries	Date	Hail Size (inches)	Injuries
6/29/2015	1.5	0	8/1/2000	1.75	0	4/3/1981	1.75	0
8/18/2014	1.25	0	5/17/2000	1.75	0	4/3/1981	2.5	0
5/31/2013	1.5	0	8/9/1999	1.75	0	7/11/1980	1.75	0
5/31/2013	1.75	0	8/9/1999	1.25	0	6/28/1979	1.5	0
5/30/2008	1.75	0	8/9/1999	2	0	7/5/1978	1.75	0
8/11/2007	1.75	0	7/8/1999	2	0	6/30/1978	1.5	0
8/11/2007	1.25	0	6/24/1998	1.75	0	7/30/1977	1.75	0
8/24/2006	1.75	0	5/18/1998	1.5	0	6/20/1974	1.75	0
8/24/2006	1.75	0	3/29/1998	2.5	0	6/20/1974	1.5	0
8/24/2006	1.75	0	3/29/1998	1.5	0	6/3/1974	1.75	0
8/24/2006	1.75	0	3/29/1998	2	0	7/3/1973	1.75	0
8/24/2006	1.75	0	6/29/1996	2.75	0	8/20/1972	1.75	0
5/8/2002	1.25	0	7/30/1994	1.25	0	7/12/1971	2	0
6/18/2001	1.25	0	7/30/1994	2.75	0	8/11/1970	1.75	0
6/18/2001	1.25	0	5/30/1994	2.75	0	8/16/1968	2.5	0
6/11/2001	1.25	0	5/27/1991	2.75	0	4/30/1967	1.75	0
5/1/2001	1.75	0	3/13/1990	1.75	0	7/15/1965	1.5	0
9/10/2000	1.5	0	8/4/1989	1.5	0	5/3/1965	1.75	0
9/10/2000	2.5	0	8/4/1989	1.25	0	8/16/1963	3	0
9/10/2000	1.25	0	6/14/1988	1.5	0	7/16/1963	1.5	0
9/10/2000	2	0	7/14/1987	1.5	0	7/16/1963	1.5	0
9/10/2000	2.5	0	7/17/1983	1.75	0	6/17/1962	1.75	0
9/10/2000	1.5	0	7/25/1982	1.5	0	6/10/1961	1.75	0
8/1/2000	1.5	0	4/29/1981	1.5	0	8/16/1959	1.5	0

Source: National Centers for Environmental Information

### Hail and Climate Change

According to the Federal Advisory Committee Draft National Climate Assessment (NCA), trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornadoes, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms

can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (National Climate Assessment Development Advisory Committee, 2013).

The occurrence of very heavy precipitation has increased in Minnesota in recent decades and future projections also indicate this will continue (International Climate Adaptation Team, 2013). While it is unknown if this precipitation will occur during severe storms that produce hail, the possibility has not been ruled out.

### Vulnerability

Summer storms affect Olmsted County each year, so there is a 100% probability that the county and its jurisdictions will be affected. According to the 66-year NCEI record, there is a 76% chance of a significant hailstorm any year in Olmsted County and a 56% chance in each year that there will be a hailstorm that produces hail greater than 1 inch in size.

The magnitude of summer storms each year is unpredictable and within Olmsted County the vulnerability of jurisdictions to summer storms does not vary geographically. The vulnerability of each jurisdiction to severe summer storms has not changed due to any development in the last 5 years.

### Severe Summer Storms and Electrical Outages

According to NOAA data, the natural hazards that caused the greatest overall property loss in Minnesota between 1996 and 2014 were thunderstorms and lightning, at \$86.3 million per year. The state also experienced 23 electric transmission outages from 1992 to 2009, 5 of which were due to heat waves and thunderstorms. On average, the number of people affected annually by all electric outages during 2008 to 2013 in Minnesota was 449,995, with a high of 1,460,810 in 2011 (U.S. Department of Energy, 2015). Figure 12 below shows the seasonality of electric outages by month for the years 2008-2013, and Figure 13 shows the causes of outages in the state between 2008 and 2013, with the largest cause being weather/falling trees.

Figure 12. Electric Utility Reported Power Outages by Month (2008-2013)

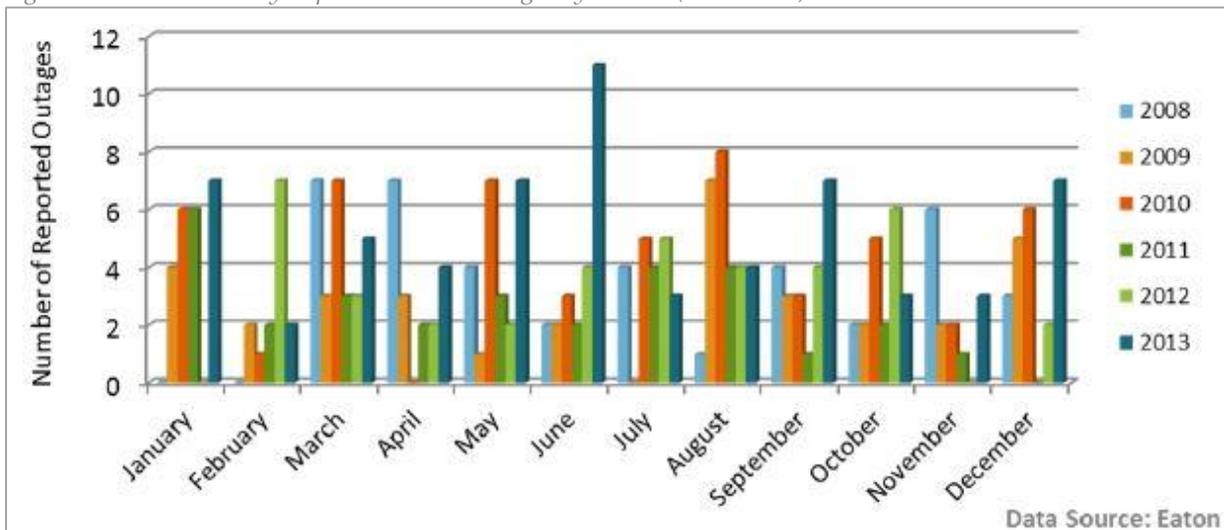
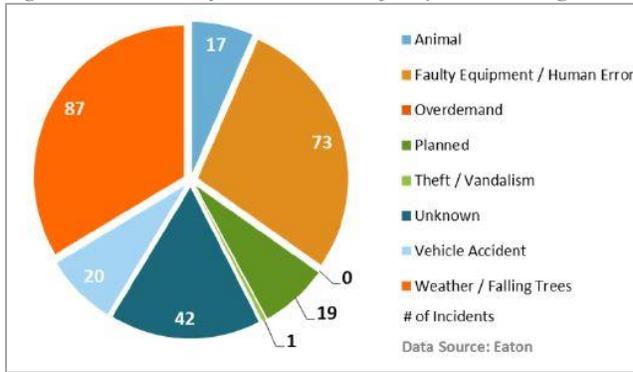


Figure 13. Causes of Electric-Utility Reported Outages (2008-2013)



### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff’s Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Olmsted County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*SKYWARN Program* – All of the cities within Olmsted County attend the SKYWARN training every spring. All cities provide information to the citizens from the information that is relayed to them from the NWS. The Cities of Eyota and Dover are the only cities within Olmsted County that are StormReady.

*Severe Weather Awareness Week* – Olmsted County participates in this and sends updates through email, Facebook and Twitter, and has conducted presentations for the community.

*Outdoor Warning Systems* – Olmsted County has 91 emergency warning sirens throughout the county, which are activated anytime there is a tornado warning or winds measured at 70 MPH or greater. The sirens are tested weekly.

*Storm Shelters* – Trailer Parks in Stewartville and Oronoco have access to safe rooms. The schools can be considered storm shelters if applicable. Oxbow Park and Chesterwoods Park have safe rooms and other county parks have storm shelters, which are the concrete bathrooms. Storm shelter and safe room locations include:

- Oronoco Estates – Located in the trailer park as soon as you drive in off 85<sup>th</sup> St NW and was built to FEMA standards for a safe room.

- Sistad Trailer Park – Located in the trailer park off 5<sup>th</sup> St SE and is a storm shelter.
- Southern Hills – There is one storm shelter located in the trailer park and is located off 23<sup>rd</sup> Ave. The other is constructed as a safe room built to FEMA standards. This safe room is located off 21<sup>st</sup> St near the pool.
- Zumbro Ridge – Located in the trailer park as soon as you drive in from 55<sup>th</sup> St NE and is a storm shelter.
- Hallmark Terrace – Located in the trailer park and is a storm shelter.
- Chester Woods Park and Oxbow Park – both are equipped with safe rooms built to FEMA standards.

### Program Gaps and Deficiencies

*Storm Shelters* – The Eyota Trailer Park does not have a designated storm shelter/safe room as each lot is owned by the individual. City parks in the City of Byron and the trailer park in the City of Dover do not have storm shelters.

*Safe Rooms* – Zumbro Ridge, Hallmark Terrace, and Sistad Trailer Park are not equipped with safe rooms. These trailer parks, along with schools and public parks that do not have shelters, should be evaluated for construction or retrofit of a safe room as appropriate.

*Backup Power* – Not all government buildings have backup power generators, such as the schools in Olmsted County.

*NWS StormReady Program* – The Cities of Pine Island, Oronoco, Byron, Chatfield and Stewartville are not currently StormReady.

#### 4.4.5 Flash Flood and Riverine Flood

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe. Urban flooding is a type of upstream flood, which involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Minnesota, but they are most common in the spring and summer. 12 flash floods have been recorded in Olmsted County since 1997.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that

are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage.

Nationwide, floods caused 4,586 deaths from 1959 to 2005 while property and crop damage averaged nearly \$8 billion per year (in 2011 dollars) from 1981-2011 (Georgakakos, et al., 2014).

During the past several decades, agencies have used the “100-year floodplain” as the design standard for projects funded by the federal government. However, today floods of that magnitude are occurring far more often than once per century (Natural Resources Defence Council, 2015). In recognition of increasing risks, in January of 2015 the President issued an executive order that updates flood protection standards that guide federally-funded projects in or near floodplains or along coastlines. These new standards require federally-funded projects to either build 2 feet above the 100-year flood elevation for standard projects and 3 feet above for critical buildings like hospitals and evacuation centers; or build to the 500-year flood elevation (The White House, 2015).

### Flood History in Olmsted County

Flooding in Olmsted County primarily occurs as a result of spring runoff, though the topography of much of southeastern Minnesota makes it prone to flooding and flash flooding during significant rain events.

Major floods are a large part of Olmsted County’s history. The earliest historical flood record for the City of Rochester goes back to October 1855, when water overflowed the west banks of the South Fork of the Zumbro River and flowed down Broadway Avenue. Other notable flood events include:

**June 1908:** The National Weather Service station at Rochester reported 4.1 inches of rain in 24 hours at Grand Meadow, 24 miles south of Rochester. 4.25 inches of rain fell in 24 hours and was preceded by 2.78 inches of rainfall 2 days earlier.

**June 1942:** A major local flood occurred on Cascade Creek on June 4 and 5, 1942, approximating a 125-year event. Floodwaters on Cascade Creek were up to 4 feet higher than any other known flood, while the South Fork of the Zumbro River and other tributaries experienced only moderate rises. Rainfall at the Rochester Weather Service station amounted to 2.33 inches on June 4, and totaled 3.76 inches from June 3-5. The relative variation of runoff on the nearby streams indicates that much heavier rainfall occurred on the Cascade Creek watershed than on other nearby areas.

**March 1965:** As the result of runoff from spring snowmelt, a major flood occurred in March 1965 with the crest stage approximately 0.7 foot higher than a March 1962 flood at the USGS gauging station near Rochester. Another flood occurred in the spring of 1965, which peaked on April 6, 1965, at Rochester, with a crest stage almost 6 feet lower than the flood of March 1965.

**June 1974 & 1978:** Flooding in the cities of Dover and Eyota occurred in June of both 1974 and 1978, as a result of abnormally heavy rainfall. Homes experienced some minor flooding problems. According to the Eyota utility superintendent, the intersection of Center Street and U.S. Highway 14 was inundated during both storms and the box culvert on Center Street was overtopped. The culverts carrying Tributary A under 5th Street, Madison Street, and 2nd Street were also overtopped during both storms. The culvert under County Road 7 (now State Highway 42) near 2nd Street was washed out in the 1974 storm, causing damage to the roadbed. Some of the businesses on Center and Front Streets suffered damage from basement seepage, but this was due to street runoff rather than flooding effects from the creek. The NWS station in Rochester estimated that the 1974 storm in Dover was greater than a 500-year event.

**July 1978:** The largest known or recorded flood in Rochester occurred on July 6, 1978, caused by an intense thunderstorm that produced a peak discharge of 30,500 cfs on the South Fork of the Zumbro River. This flash flood claimed 5 lives and caused property losses to thousands of homes, hundreds of businesses, and numerous public properties. The National Weather Service station at the Rochester airport recorded 4.99 inches of rain in 3 hours. Total rain at the airport for this 8-hour storm was 6.74 inches, whereas the average weighted rain over the 304 square mile drainage area was calculated to be 5.65 inches. At the USGS gauging station at Rochester, the South Fork of the Zumbro River rose to its crest in 15 hours at an average rate of 1.3 feet per hour and a maximum rate of 3.25 feet per hour. The river remained above bank-full stage for 35 hours. According to the Minnesota Weather Almanac, 25% of Rochester was inundated by as much as 6 feet of water, and nearly 5,000 residents were evacuated (Seeley M. , 2015).

**September 1978:** A second flash flood hit Rochester a few months later, with over 7 inches of rain recorded downtown. Many of the same streets and storm sewers that flooded in July flooded again. According to the Minnesota Weather Almanac, "These storms inspired one of the largest flood-control projects undertaken in Minnesota, its goal to mitigate future flood threats in the Rochester area" (Seeley M. , 2015).

**July 1981:** Severe storms brought flash floods to Olmsted County, with the Rochester International Airport receiving 7.47 inches of rain, while an unofficial report 7 miles away recorded 11.04 inches. The Root River flooded, and a dozen homes had to be evacuated (Seeley M. , 2015).

**June 2004:** Heavy rains fell in two waves over southeast Minnesota on June 8 and 9, 2004. The remnants of the torrential rains that caused flooding and mudslides in the Mankato area drifted east over southeast Minnesota late on June 8 and into the early morning hours of June 9. Later in the morning of June 9, thunderstorms redeveloped over south central and southeast Minnesota and continued throughout the afternoon and early evening. The Rochester airport recorded 4.06 inches of rain on June 9, setting a record for the date. Another 0.20 inch had fallen on June 8, leading to a two-day total of 4.26 inches. The rains fell upon soil already saturated from the heavy rains of May 2004. The deluge led to street flooding and wet basements in Rochester. One apartment building in Rochester had water flowing through the lowest floor. In scattered areas sanitary sewer backups

occurred. Numerous accounts of water overtopping roads were reported throughout the region. Mudslides were reported within the City of Rochester.

**September 2004:** On September 14-15, 2004, a series of disturbances along a stalled frontal boundary dropped heavy rains in southern Minnesota. The southeast and southwest corners of Olmsted County received 6 inches of rainfall over a 24-hour period. There were numerous reports in southern Minnesota of stream flooding, urban flooding, mudslides, and road closures. Flash flood warnings were issued for 13 Minnesota counties including all counties within the Zumbro and Root River watersheds. In total, the storm resulted in more than \$6 million in property damage and \$22 million in crop damage (Seeley M. , 2015).

**August 2007:** With 8 inches of rain over a 3-day period, Olmsted County was one of 5 counties included in a FEMA disaster declaration due to flash flooding. Neighboring counties recorded 7 deaths. As a result of DR-1717, the state of Minnesota received nearly \$40 million in public assistance funding, and Olmsted County received \$1.8 million. At the time, this storm event was one of the most extraordinary precipitation events in Minnesota's modern history according to the State Climatologist. A new Minnesota 24-hour rainfall record was broken: the State Climate Extremes Committee agreed that the 15.10 inches total recorded on Sunday August 19, 2007 at Hokah in Houston County was the largest 24-hour total ever measured at an official National Weather Service observing station in Minnesota.

The City of Eyota experienced basement flooding on a large scale that appeared not to have been due to overland flows of floodwater, but saturated soils and a high groundwater table. Dover, Eyota and Rochester sustained damage to homes and other buildings due to sewer backup into basements. About one third of the homes in Dover experienced sewer backup during this flood, according to the Mayor.

Stream bank damage occurred on Cascade Creek within Rochester that threatened the loss of accessory buildings, but no residences were directly affected. Severe stream channel and agricultural land erosion, landslides, and resulting sedimentation occurred throughout the region. Landslides occurred in scattered areas along stream channels, roads, and in developed areas in the rural portions of Olmsted County and in Rochester.

Figure 14. County Road 18 Bridge in Oronoco, September 2010 (City of Oronoco, 2010)



**September 2010:** Heavy rain fell towards the end of September on abnormally wet soils, resulting in significant river and flash flooding. The approach on the north side of the County Road 18 bridge going through Oronoco washed out (Figure 14), due to the Zumbro River flooding

and the Lake Shady Dam failing. According to NCEI data, there was \$7 million of damages in Olmsted County, which was included in the federal FEMA disaster declaration DR-1941. The State of Minnesota received \$33 million in public assistance, while Olmsted County received \$750,000.

When the Lake Shady dam gave out and flooded the city, it also destroyed the lake in the process, as it eventually turned into a sediment-filled dead zone. In October of 2015, KTTC reported that Olmsted County officials had unanimously voted to award the Lake Shady dam removal contract to Veit and Company Incorporated. The dam will be removed to allow space for a more natural stream and surrounding park (KKTC, 2015).

Figure 15. Flooding in the Charlton Building, August 2013 (Sederstrom, 2013)



**August 2013:** Locally heavy rains in Rochester produced flash flooding that inundated several street intersections, causing numerous stranded vehicles, some of which had water up to their windows. The heavy rain caused water to cascade into a below-ground entrance of a Mayo Health building (Figure 15). The NCEI damage estimate for the flood was \$450,000.

**June 2014:** Heavy summer storms produced downpours that resulted in flooding across portions of Dodge, Olmsted, and Mower Counties. A parking lot on the southwestern side of Rochester flooded, partially submerging several vehicles. The Governor of Minnesota declared a state of emergency in several counties, including Olmsted. A Presidential disaster declaration was later declared; however, Olmsted County was not part of the declaration.

**September 2016:** Flash flooding occurred in Genoa, and floodwaters covered County Road 105 near Oxbow Park north of Byron, and County Road 126 east of Rock Dell. In Rochester, runoff from the heavy rain pushed the South Fork of the Zumbro River out of its banks, cresting at a foot over the flood stage at 14.95 feet. A state of emergency was declared in neighboring Fillmore County, and a federal disaster declaration was made for Fillmore and Houston Counties.

Olmsted County has noted that it constantly strives to improve its road and culvert infrastructure against flooding, but is limited by financial resources to go beyond maintenance on some projects. The roads that most commonly wash out during heavy rains and floods are gravel township roads. Others within the county include but are not limited to:

- Multiple areas on Olmsted County Road 105 NW
- The intersection/bridge on Olmsted County Road 3 at County Rd 12 NW
- The bridge on County Road 31 NE
- County Road 5 NW just north of County Road 4 NW
- County Road 142 SE west of the county line
- The bridges and roadways on County Road 107 at County Road 152 NE
- County Road 139 SE just north of Highway 30 SE
- County Road 101/40<sup>th</sup> Ave SE south of 37<sup>th</sup> St SE
- County Road 119 NE north of Silver Creek Rd NE
- County Road 102 NE south of 65<sup>th</sup> St NE
- County Road 24 east of 97<sup>th</sup> Ave NE
- County Road 150 SW south of County Road 25
- County Road 3 SW south of County Road 25
- County Road 126 SW east of County Road 3 SW

Figure A – 29 in Appendix A shows which roads and culverts have a tendency to experience damage during floods. All of the roads flooded and needed to be replaced/repared in the 2007 and/or 2010 floods. Olmsted County Public Works advised that these segments will most likely need to be redone again after the next flood.

Table 21 below lists Olmsted County’s historical floods from 1997-2016 as recorded by the NCEI. Although no deaths or injuries were recorded with these floods, the cumulative property damage estimate is greater than \$56 million dollars.

*Table 21. Olmsted County Historical Floods, 1997-2016*

Location or County	Date	Type	Deaths	Injuries	Property Damage
Rochester	9/22/2016	Flood	0	0	0
Genoa	9/21/2016	Flash Flood	0	0	\$2,000
Rochester	8/17/2014	Flood	0	0	0
Byron	6/18/2014	Flood	0	0	0
Rock Dell	6/16/2014	Flash Flood	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Rochester	6/16/2014	Flood	0	0	\$10,000
Rochester	8/22/2013	Flash Flood	0	0	\$400,000
Rochester	8/22/2013	Flood	0	0	\$35,000
Rochester	6/22/2013	Flood	0	0	0
Byron	3/30/2013	Flood	0	0	0
Douglas	7/28/2011	Flood	0	0	0
Salem Corners	7/23/2011	Flood	0	0	0
Douglas	7/15/2011	Flood	0	0	\$25,000
Little Vly	3/22/2011	Flood	0	0	0
Oronoco	9/24/2010	Flash Flood	0	0	\$7,000,000
Little Vly	9/23/2010	Flood	0	0	0
Cummingsville	9/23/2010	Flood	0	0	\$3,550,000
Rochester	9/23/2010	Flood	0	0	0
Rochester	9/23/2010	Flood	0	0	0
Rochester	8/13/2010	Flood	0	0	0
Little Vly	8/13/2010	Flood	0	0	0
Rock Dell	6/12/2008	Flood	0	0	\$15,000
Viola	6/8/2008	Flood	0	0	\$50,000
Rochester	8/19/2007	Flood	0	0	\$20,000
Rochester	8/19/2007	Flood	0	0	\$20,000
Rochester	8/18/2007	Flash Flood	0	0	\$35,000,000
Eyota	8/18/2007	Flash Flood	0	0	\$9,600,000
Olmsted (Zone)	9/15/2004	Flood	0	0	\$425,000
Countywide	9/14/2004	Flash Flood	0	0	\$7,500
Countywide	6/9/2004	Flash Flood	0	0	0
Countywide	6/11/2002	Flash Flood	0	0	\$3,500
Countywide	4/11/2001	Flash Flood	0	0	\$1,000
Countywide	6/20/2000	Flood	0	0	\$4,000
Countywide	6/1/2000	Flood	0	0	\$10,000
Countywide	5/17/2000	Flood	0	0	0
Dover	8/23/1999	Flash Flood	0	0	\$1,000
Rochester	6/27/1998	Flash Flood	0	0	\$15,000
Byron	6/27/1998	Flood	0	0	0
Byron	7/13/1997	Flood	0	0	0

Source: National Centers for Environmental Information

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers across the United States. 11 USGS gauging stations are located in Olmsted County, listed in Table 22 below, along with data on their highest-recorded gauge heights.

Table 22. Historical Flood Crests for USGS gauging stations in Olmsted County

Location	USGS ID Number	Date	Gauge Height (feet)	Stream flow (cfs)
South fork of Zumbro River on Belt Line at Rochester	05372800	7/1/1983	1001.21	5,480
Bear Creek at Rochester	05372930	3/15/1980	999.11	1,075
Silver Creek at DNR gauge in Rochester	05372950	7/6/1978	16.18	9,290
Cascade Creek at Rochester	05372990	7/4/1983	992.59	414
South fork of Zumbro River at Rochester	05372995	7/6/1978	23.36	30,500
South fork of Zumbro River near Rochester	05373000	7/6/1978	23.36	30,500
Zumbro River Tributary near South Troy	05373350	7/17/1978	14.07	138
Middle fork of Whitewater River near St. Charles	05376100	5/16/1992	13.08	619
North branch of Root River tributary near Stewartville	05383600	7/2/1960	13.47	328
Mill Creek tributary near Chatfield	05383700	7/20/1974	17.32	1,030
Mill Creek neat Chatfield	05383720	7/6/1978	17.79	8,580

### Vulnerability and Hazus-MH Hazard Analysis

Hazus-MH was used to estimate the damages incurred for a 100-year flood in Olmsted County using a 10-meter DEM (digital elevation model) to create a flood depth grid from a digital DFIRM (digital flood insurance rate map).

This documentation does not provide full details on the processes and procedures completed in the flood risk analysis, it is only intended to highlight the major inputs that were used. The fields obtained from the Olmsted County tax assessor are noted in parentheses.

Olmsted County-specific building data was sourced from parcel tax databases and parcel polygon databases, including building valuations (EMV) and occupancy class (CLASSIFICATION). Hazus-MH analysis of structures takes into account the depth of water in relation to the structure using finished square footage (ADDN\_AREA and Fin Bsmt Living Area and ADDN\_DESC for number of stories). The tool also considers the actual dollar exposure to the structure for the costs of building reconstruction (EMV), content (calculated based on EMV and finished square footage). Damages are based upon the assumption that each structure will fall into a structural class (assumptions made based on Year Built and Effective Year), and structures in each class will respond in a similar fashion to a specific depth of flooding. Furthermore, the damage estimates assume an equal distribution of building classifications across the developed portion of a census block. These assumptions suggest that the loss estimates for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

Building counts were aggregated from the individual parcel records to the relevant census administrative boundaries. There are an estimated 50,610 parcels with structures in the region with a total replacement value (excluding contents) of \$12.2 million. Approximately 91% of the parcels (and 68% of the building value) are associated with residential housing. Using the Olmsted County updated general building stock, the Hazus model reported an estimated 453 parcels with buildings will be at least moderately damaged. There are an estimated 62 buildings that will be completely destroyed.

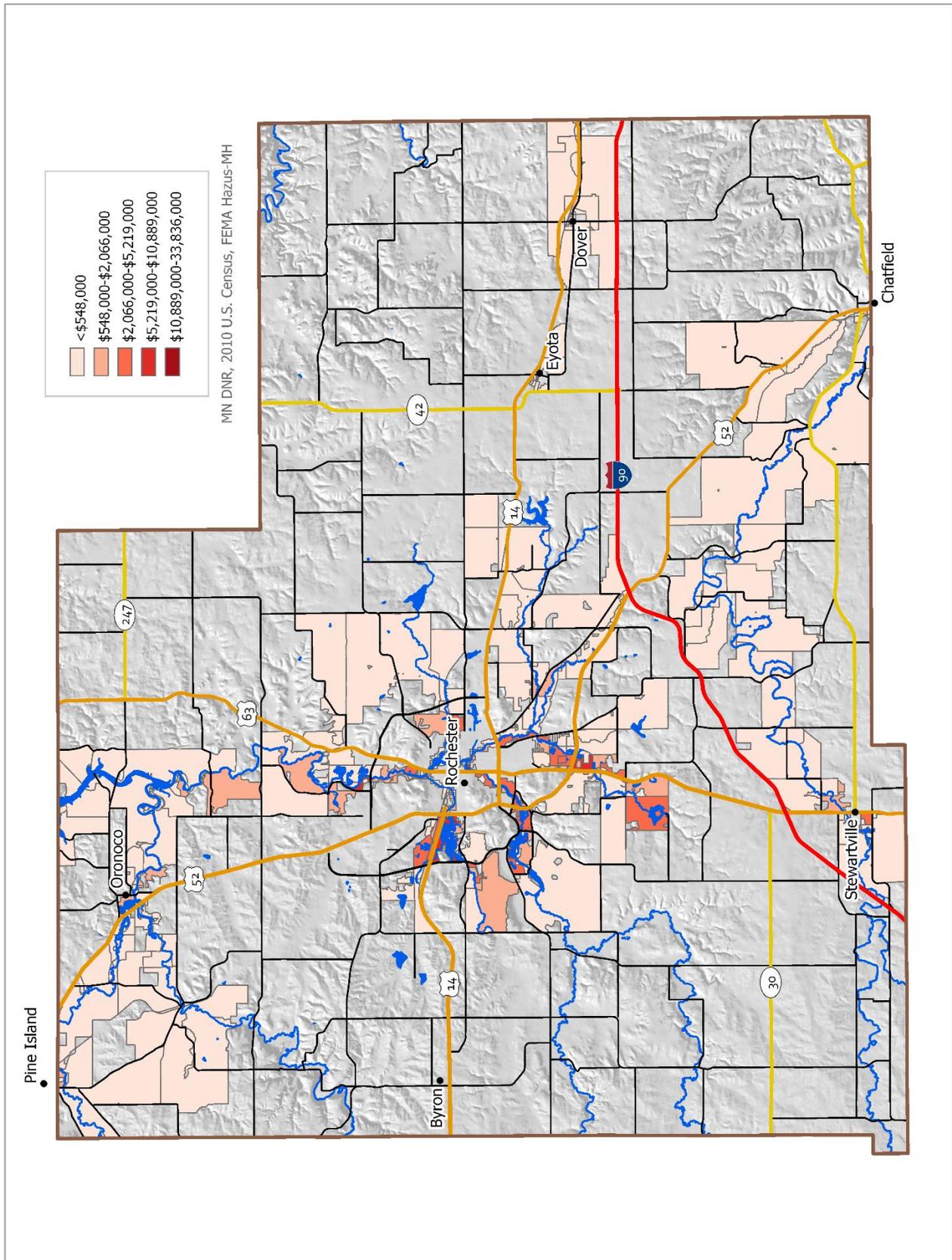
The total economic loss estimated for the flood is 213 million dollars, which represents 8.5% of the total replacement value of the parcels exposed. Building losses are broken into 2 categories: direct building losses and business interruption losses. Direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. Business interruption losses are associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood. The total building-related losses in the Hazus model was \$204 million dollars. 4% of the estimated losses were related to business interruption in the region. Residential occupancies made up 40% of the total loss.

The reported building counts should be interpreted as degrees of loss rather than an exact number of buildings exposed to flooding. These numbers were derived from aggregate building inventories, which are assumed to be dispersed evenly across census blocks. Hazus-MH requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses. The total estimated number of damaged buildings, total building losses, and estimated total economic losses are shown in Table 23. The distribution of economic losses for Olmsted County is depicted in Figure 16.

Table 23. Olmsted County Total Economic Loss from 100-Year Flood

General Occupancy	Total Parcels	Parcels with Damaged Buildings	Total Building Exposure (In \$1000s)	Total Economic Loss (In \$1000s)	Building Loss (In \$1000s)
Agricultural	2,195	0	131,720	1,272	218
Commercial	1,682	15	2,462,099	47,202	13,124
Education	80	0	519,977	14,253	2,356
Government	250	0	381,904	57,915	13,433
Industrial	127	0	92,918	2,424	647
Religious/Non-Profit	297	0	268,199	6,384	1,025
Residential	45,979	525	8,324,934	84,403	58,309
<b>Total</b>	<b>50,610</b>	<b>540</b>	<b>12,181,751</b>	<b>212,953</b>	<b>89,112</b>

Figure 16. Distribution of Estimated Economic Loss for Olmsted County in 100-Year Flood



Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be overstated because values are distributed evenly in a census block. The 5 census blocks showing the highest estimated loss values are shown in Table 24, with their spatial extents shown in Figures 17-21.

Table 24. Olmsted County Census Blocks with the Greatest Estimated Losses in the 100-Year Floodplain

Census Block Number	Total Estimated Loss	City
271090021004036*	\$4,331,000	Stewartville
271090019002022	\$1,447,000	Pine Island
271090017032003	\$1,368,000	Oronoco
271090021003010	\$1,352,000	Stewartville
271090019001059	\$1,283,000	Oronoco

\*Because the parcels are not aligned with census block boundaries, this high value parcel was assigned to a flooded block that had a high percent of flooding, instead of the block that corresponds with the structures in the parcel.

Figure 17. Census Block #271090021004036 and 100-Year Floodplain near Stewartville



Figure 18. Census Block #271090019002022 and 100-Year Floodplain in Pine Island

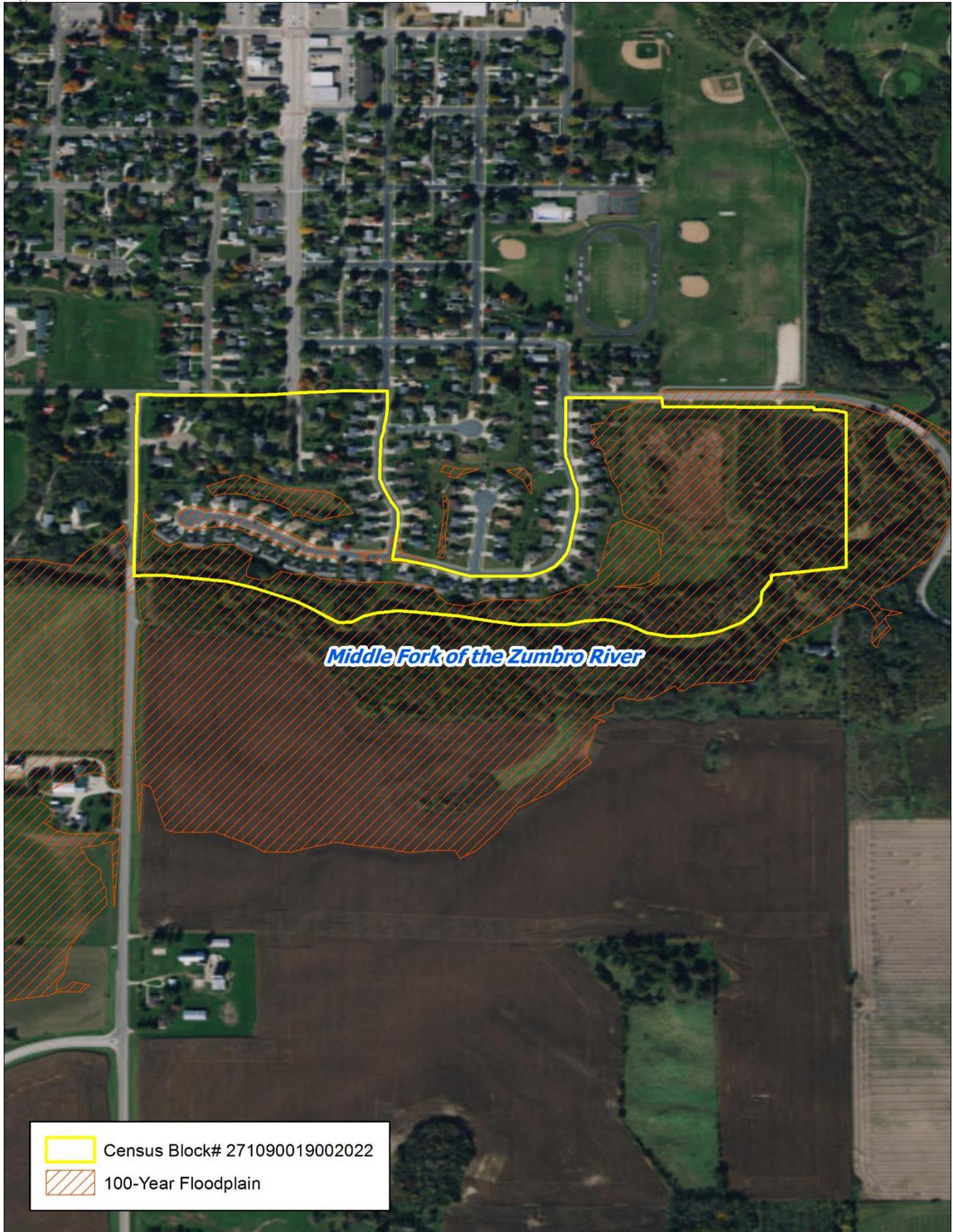


Figure 19. Census Block #271090017032003 and 100-Year Floodplain near Oronoco

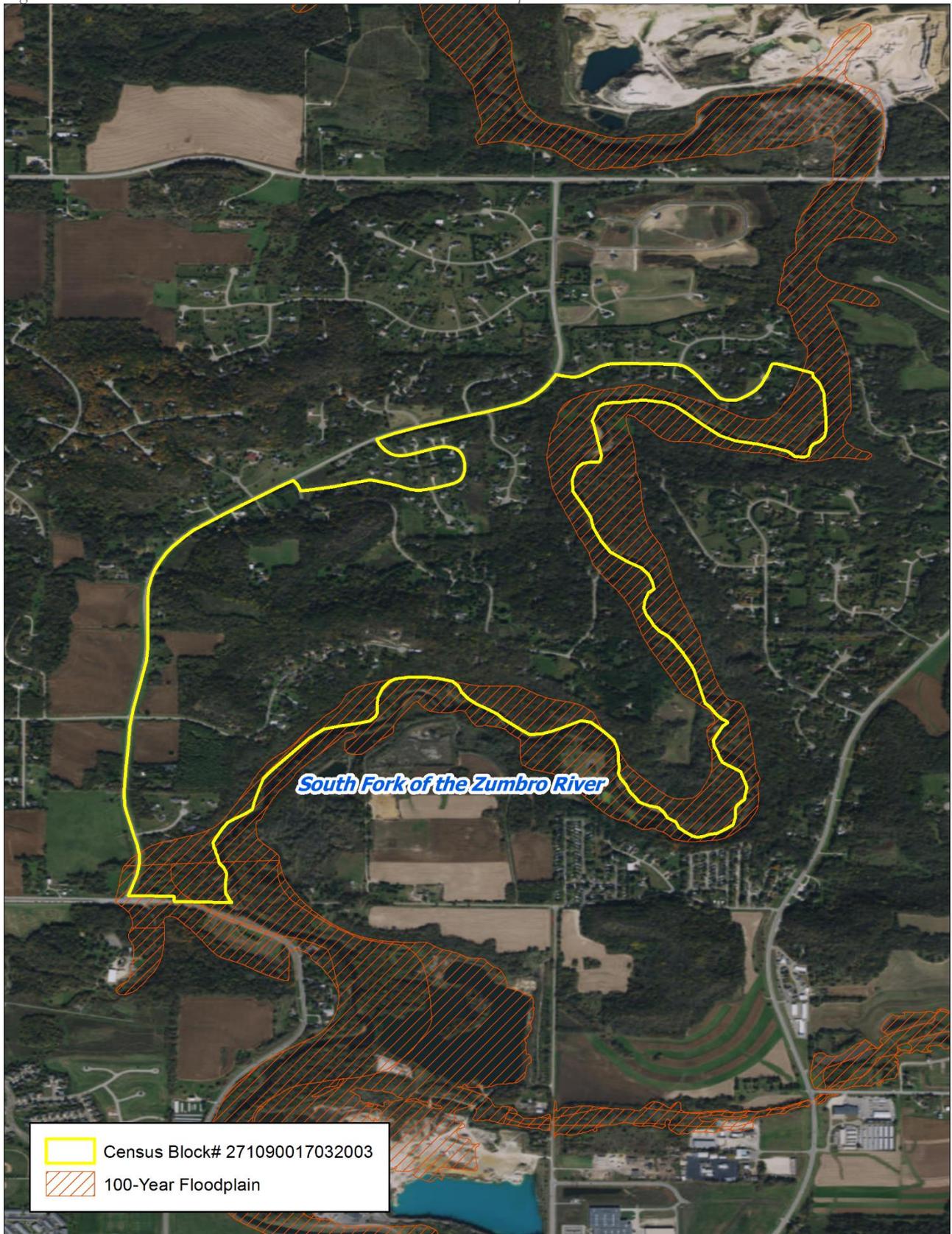


Figure 20. Census Block #271090021003010 and 100-Year Floodplain in Stewartville

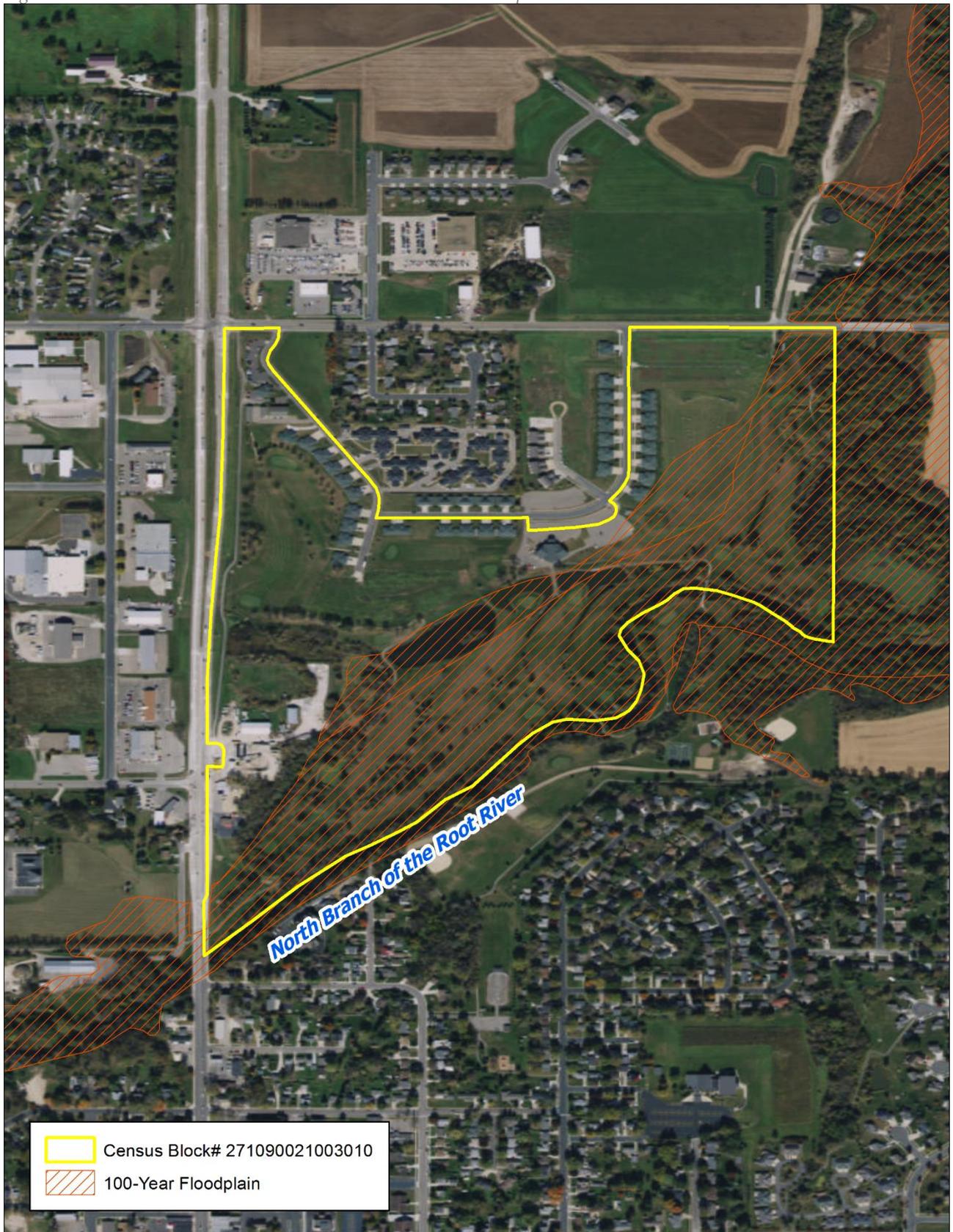
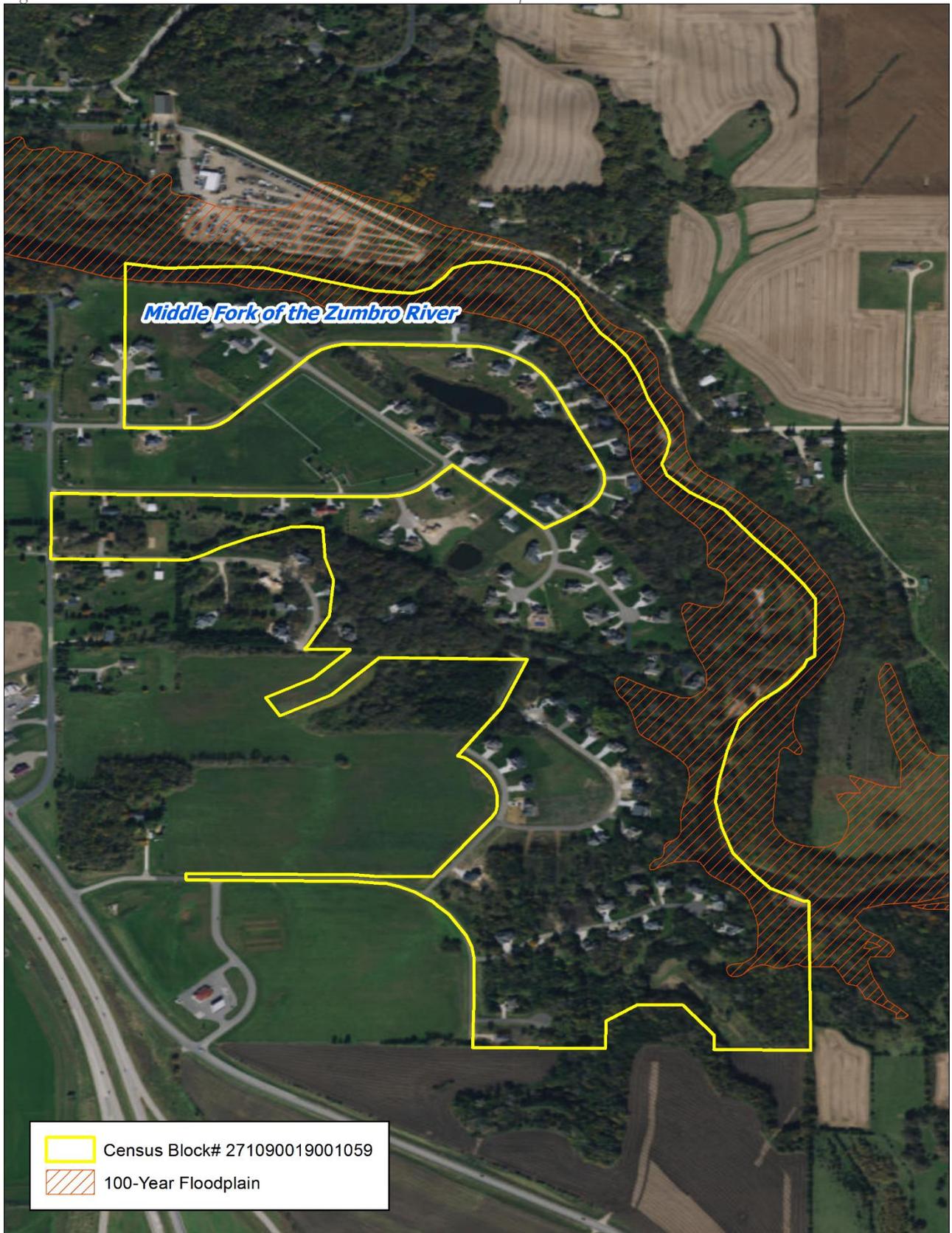


Figure 21. Census Block #271090019001059 and 100-Year Floodplain in Oronoco



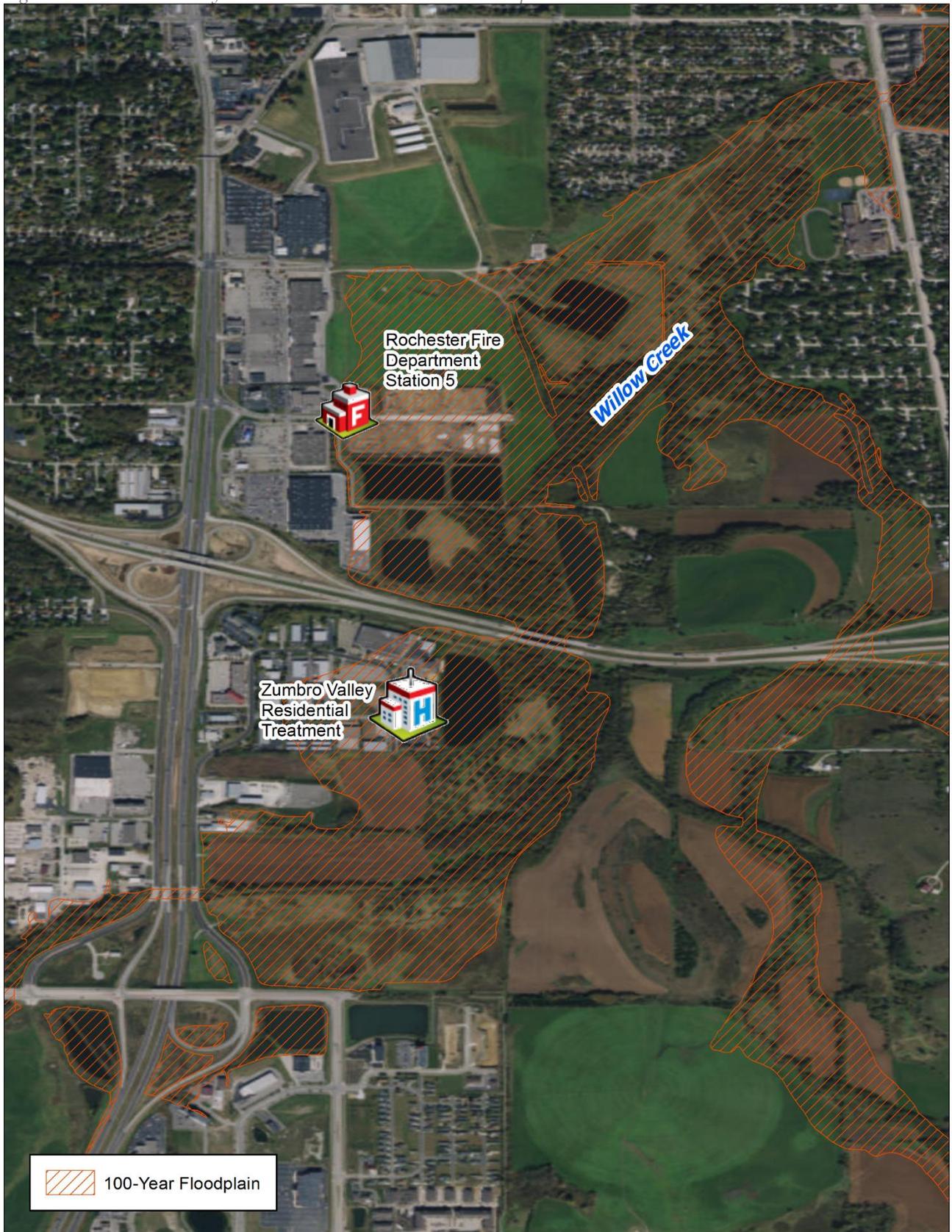
*Hazus-MH Essential Facility Loss Analysis*

Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station will no longer be able to serve the community). Two of the essential facilities (care facilities, fire stations, police stations, and schools) included in the Hazus-MH analysis falls within the flood boundary (Table 25), Rochester Fire Department Station 5 and Zumbro Valley Residential Treatment (Figure 22).

*Table 25. Olmsted County Essential Facilities within estimated 100-Year Flood Boundary*

Type	Name	Site Address	City
Fire Station	Rochester Fire Department Station 5	305 28th St.	Rochester
Hospital	Zumbro Valley Residential Treatment	343 Woodlake Dr.	Rochester

Figure 22. Olmsted County Essential Facilities in 100-Year Floodplain



### *Hazus-MH Shelter Requirement Analysis*

Hazus-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus-MH also estimates those displaced people that may require accommodations in temporary public shelters. The model estimates 992 households may be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, the model estimates 2,170 people (out of a total population of 144,248) may seek temporary shelter in public shelters.

### *Hazus-MH Debris Generation Analysis*

Hazus estimates the amount of debris that may be generated by the flood based on best practice assumptions made using year built and occupancy class. The model breaks debris into 3 general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 23,659 tons of debris would be generated. Of the total amount, Finishes composes 38% of the total and Structural composes 35% of the total. If the debris tonnage is converted into an estimated number of truckloads, it would require 946 truckloads (@25 tons/truck) to remove the debris generated by the flood.

### *Flooding and Climate Change*

As Minnesota's climate changes, the quantity and character of precipitation is changing. Average precipitation has increased in the Midwest since 1900, with more increases in recent years. The Midwest has seen a 45% increase in very heavy precipitation (defined as the heaviest 1% of all daily events) from 1958 to 2011 (National Climate Assessment Development Advisory Committee, 2013). This precipitation change has led to amplified magnitudes of flooding. Increased precipitation may also show seasonal changes, trending toward wetter springs and drier summers and falls. An example of a recent year with this character was 2012, when many MN counties were eligible for federal disaster assistance for drought, while others were eligible for flooding, and 7 were eligible for both in the same year (Seeley, 2013). In 2007, 24 Minnesota counties received drought designation, while 7 counties were declared flood disasters. In 2012, 55 Minnesota counties received federal drought designation at the same time 11 counties declared flood emergencies. In addition, the yearly frequency of the largest storms – those with 3 inches or more of rainfall in a single day – has more than doubled in just over 50 years. In the past decade, such dramatic rains have increased by more than 7% (MN Environmental Quality Board, 2014).

Southeastern Minnesota has experienced three 1000-year floods in the past decade: in September 2004, August 2007, and September 2010 (Meador, 2013). The 2004 flood occurred when parts of south-central Minnesota received over 8 inches of precipitation. Faribault and Freeborn counties received over 10 inches in 36 hours. The deluge led to numerous reports of stream flooding, urban flooding, mudslides, and road closures (MN DNR, 2004). During the 2007 event, 15.10 inches fell in 24 hours in Houston County, the largest 24-hour rainfall total ever recorded by an official National Weather Service reporting location. The previous Minnesota record was 10.84 inches in 1972. The resulting flooding from

the 2007 rainfall caused 7 fatalities (MN DNR, 2007). In September 2010, a storm on the 22-23<sup>rd</sup> resulted in more than 6 inches of rain falling over 5,000 square miles in southern Minnesota. Rainfall totals of more than 8 inches were reported in portions of 10 counties. The heavy rain, falling on soils already sodden from a wet summer, led to numerous reports of major rural and urban flooding. For many monitoring locations in southern Minnesota, stream discharge resulting from the deluge was the highest ever seen during an autumn flood (Minnesota Climatology Working Group, 2010).

June 2014 was the wettest month on record in Minnesota, with a state-averaged rainfall of 8.03 inches. This broke the previous record of 7.32 inches, which occurred in both July 1897 and June 1914. Rainfall totals for much of the state ranked above the 95<sup>th</sup> percentile when compared with the historical record; in some cases the totals tripled that of the historical rainfall average for June. Scott County received between 10-12 inches of rain during June 2014 (MN DNR, 2014). A presidential disaster declaration was declared due to the severe storms, winds, flooding, landslides, and mudslides (DR-4182), which included 37 Minnesota counties and 3 Indian Reservations.

### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Olmsted County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*School Closings* – The schools have policies and procedures in place for severe weather. Schools use the notification system Rochester Alert, radio, television, and media to send out all notifications when needed.

*National Flood Insurance Program (NFIP)* – The NFIP is a federal program created by Congress to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses. Olmsted County and all of its cities participate in the NFIP, with the exception of the City of Byron, which does not participate and has no FEMA mapped high risk areas. There are 9 townships within the county that are not participating in the NFIP program but do have FEMA mapped high risk

areas (Cascade Township, Dover Township, Elmira Township, Haverhill Township, High Forest Township, New Haven Township, Orion Township, Pleasant Grove Township, and Rochester Township). The remaining 6 townships within the county are not participating and do not have FEMA mapped high risk areas (Farmington Township, Kalmar Township, Rock Dell Township, Salem Township, and Viola Township).

*No-Wake Ordinance* – There is a no-wake ordinance for the only recreational lake in Olmsted County, Lake Zumbro.

*Water Well and Water Supply Ordinance* – An ordinance regulating the construction and operation of water wells and water supply systems and governing the orderly and proper sealing of water wells, establishing standards and requirements for water well and water supply managements within the incorporated and unincorporated areas of Olmsted County.

*Stormwater Management Plan* – There are 7 reservoirs within Olmsted County that act as storm water retention sites. The storm water is stored at these retention sites to mitigate flooding.

*Floodplain Mapping* – The GIS Department in the county has these maps available.

*Rain Gauge Monitoring* – There are gauges throughout the county where flooding is a possibility.

*SWCD Special Projects* – The Olmsted SWCD 2016 Operational Plan includes the following special projects in support of flooding mitigation:

- Minnesota Board of Water and Soil Resources grant funding will be pursued to implement water quality improvement projects in the South Zumbro Watershed. The Olmsted SWCD will work with townships, county and state agencies, landowners and consultants to identify potential locations and sizes for water and sediment retention structures designed to reduce flooding and damage to the county's roads and bridges. These structures would retain water and sediment upon the landscape, reduce peak flows and sediment loads to ditches and streams.
- The 2013 Southern Minnesota Flood Relief grant for the affected properties owners of Stonegate Court will be used to stabilize the stream bank of the South Zumbro River. The project is a cooperative effort with the City of Rochester and Olmsted SWCD.

### Program Gaps and Deficiencies

*Road and Culvert Improvements* – The County strives to constantly improve its road and culvert infrastructure against flooding, but is limited by financial resources to go beyond maintenance on some projects. The roads that most commonly wash out during heavy rains events and floods are gravel township roads. Others within the county include but not limited to:

- Multiple areas on Olmsted County Road 105 NW
- The bridge on Olmsted County Road 3 at Pine Island
- The bridge on County Road 31 NE

- County Road 5 NW just north of County Road 4 NW
- County Road 142 SE west of the county line
- The bridges and roadways on County Road 107 at County Road 152 NE
- County Road 139 SE just north of Highway 30 SE
- County Road 120 northeast of Stewartsville
- County Road 126 northeast of Rock Dell
- County Road 138 south of T.H. 30
- County Road 101/40<sup>th</sup> Ave SE south of 37<sup>th</sup> St SE
- County Road 119 NE north of Silver Creek Rd NE
- County Road 102 NE south of 65<sup>th</sup> St NE
- County Road 24 east of 97<sup>th</sup> Ave NE
- County Road 150 SW south of County Road 25
- County Road 3 SW south of County Road 25
- County Road 126 SW east of County Road 3 SW

*Rain Gauge Monitoring* – The rain gauges in certain areas (NW of the county and Oxbow Park) are in need of an upgrade. The cost and maintenance is extremely expensive and the county is working on a more effective way to maintain these. A majority of the flooding in Olmsted County is due to the different tracks of the Zumbro River in Dodge County. The benefit for Olmsted County would be for Dodge County to install rain gauges in the Zumbro River so flooding could be prevented.

*Grading/landscaping and Green Infrastructure Projects/Education* – Identification of landscaping and green infrastructure projects around homes or businesses that are at risk for flooding should be researched and implemented to mitigate against flood damage. Education of property and business owners would assist in addressing this need.

#### **4.4.6 Severe Winter Storms – Blizzards, Ice Storms**

Blizzards are storms that contain heavy snowfall, strong winds, and cold temperatures. The combination of these elements creates blinding snow with near zero visibility, deep snowdrifts, and life-threatening wind chill temperatures. Blizzards are the most dramatic and destructive of all winter storms that occur within Olmsted County, and are generally characterized as storms bearing large amounts of snow accompanied by strong winds. They have the ability to completely immobilize travel in large areas and can be life-threatening to humans and animals in their path. According to the National Weather Service (NWS), there is no fixed temperature requirement for blizzard conditions, but the life-threatening nature of low temperatures in combination with blowing snow and poor visibility increases dramatically when temperatures fall below 20° F. Blizzards typically occur between October and April; however, they occur most frequently from early November to late March.

The greatest numbers of blizzards historically have occurred in the months of January, followed by March and November, respectively. Olmsted County, along with all areas of Minnesota, is susceptible to blizzards.

Figure 23. Armistice Day Blizzard, 1940



Damages from blizzards can range from human and livestock deaths to significant snow removal costs. Stranded drivers can make uninformed decisions, such as leaving the car to walk in conditions that put them at risk. Because of the blinding potential of heavy snowstorms, drivers are also at risk of collisions with snowplows or other road traffic. Drivers and homeowners without emergency plans and kits are vulnerable to the life-

threatening effects of heavy snowstorms such as power outages, cold weather, and inability to travel, communicate, obtain goods or reach their destinations. Heavy snow loads can cause structural damage, particularly in areas where there are no building codes or where residents live in manufactured home parks. The frequency of structural fires tends to increase during heavy snow events, primarily due to utility disruptions and the use of alternative heating methods by residents.

Between the years of 1975 and 1991, there were 49 deaths associated with blizzards statewide, or an average of 3 deaths per year. Deaths attributable to blizzards have dropped in recent years, primarily due to increased weather awareness and warning capabilities across the state. The economic costs of winter storms are generally not recorded by the NCEI; however, a winter storm in November 2001 resulted in property damage of \$500,000.

Ice storms are described as occasions when damaging accumulations of ice occur due to freezing rain. The terms freezing rain and freezing drizzle warn the public that a coating of ice is expected on the ground and other exposed surfaces. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers.

Communications and power can be disrupted for days while utility companies work to repair extensive damage. Ice forming on exposed objects generally ranges from a thin glaze to coatings more than 1 inch thick. Even small accumulations of ice on sidewalks, streets, and highways may cause extreme hazards to Olmsted County motorists and pedestrians. Sleet does not stick to trees and wires, but sleet of sufficient thickness does cause hazardous driving conditions. Heavy sleet is a relatively rare occurrence, defined as an accumulation of ice pellets covering the ground to a depth of ½-inch or more.

Ice and sleet storms typically occur from October through April. The NWS notes that over 85% of ice storm-related deaths are the result of traffic accidents. According to the NCEI, 6 ice storms occurred in the county since 1996, resulting in 1 injury (in 1998). The most recent ice storm occurred in April of 2013, causing \$20,000 in damage. The storm resulted in schools closing in the Rochester area, and several accidents reported along Interstate 90 in Olmsted County.

Observing winter storm watches and warnings and adequate preparation can lessen the impact of blizzard events in Minnesota. Technical advances made in transportation, including safer vehicles and improved construction and maintenance of roads, have also contributed to the decline in deaths related to blizzards. Historical estimates of dollar losses associated with blizzards were not available for the purposes of this analysis. However, costs incurred by state and local government for snow removal associated with disaster declaration DR-1158 (January 1997) totaled over \$27,300,000 dollars. Blizzards rank 9<sup>th</sup> out of the 10 natural hazards economically impacting Minnesota according to the statewide risk analysis. The chance that another winter storm affecting Olmsted County will occur is highly probable.

**Severe Winter Storm History in Olmsted County**

The total of notable events defined as heavy snows, blizzards, winter weather, ice storms and winter storms in Olmsted County recorded by the NCEI for the period from 1996 to 2016 is 86. An overview of some of the most notable winter storm events is provided in Table 26 below.

*Table 26. Notable Winter Weather Events in Olmsted County*

Date	Type	Cost	Deaths	Injuries	Description
November 2015	Winter Weather	\$14,000	1	0	One person was killed in a two-car accident on State Highway 42 south of Elgin. The roads were icy at the time of the accident and the automated weather observing equipment at the Rochester airport was reporting freezing rain.
February 2014	Blizzard	\$15,000	0	0	Extremely poor visibility due to blowing snow prompted Olmsted and Mower Counties to pull their snowplows off the roads by late evening on the 20th. Five rescues were made by snowmobile in Olmsted County. In Rochester the city bus service was suspended for the first time in 32 years and all flights in and out of the Rochester airport were canceled.
May 2013	Heavy Snow	\$50,000	0	0	Snowfall exceeded 15 inches over portions of Olmsted and Dodge Counties. The heavy wet snow caused several power outages to occur, as 10,000 customers in Rochester lost power while over 1,700 customers were without power across parts of Mower, Dodge, Fillmore, Wabasha, Winona and rural Olmsted Counties. The weight of the snow caused some buildings and barns to collapse and hundreds of trees across the region were damaged.
April 2013	Ice Storm	\$20,000	0	2	Two people were injured in an accident along Interstate 90 near Dover. Several other accidents occurred along the Interstate because of the icy roads and schools in the Rochester area were closed April 11th.

Date	Type	Cost	Deaths	Injuries	Description
January 2013	Winter Storm	\$15,000	0	0	Freezing rain and sleet created a coating of ice on exposed surfaces leading to slick roads and numerous accidents occurred across the county. The highest reported ice accumulation was 0.15 of an inch at the Rochester airport. At least a dozen people were treated at the Mayo Clinic for weather-related injuries.
March 2011	Winter Weather	\$10,000	0	0	A 10-vehicle accident occurred near the intersection of U.S. Highway 63 and County Road 16 that prompted officials to shut down the northbound lanes of Highway 63 for a while. Only one minor injury occurred. At least 17 other minor accidents occurred around Olmsted County as well.

### Severe Winter Storms and Climate Change

Historically, winter storms have had a large impact on public safety in Minnesota. This will continue, with a possible increase in snowstorm frequency and annual total snowfall. Winter weather is often a cause of power outages. Pressures on energy use, reduced reliability of services, potential outages and the potential rise in household costs for energy are major climate change risks to public health.

According to the 2015 Minnesota Weather Almanac, a recent study of seasonal snowfall records across the state from 1890-2000 showed that 41 of 46 climate stations recorded an increase in average annual snowfall, by as much as 10 inches. Higher snowfall levels can result in greater runoff potential during spring snowmelt, and many watersheds in Minnesota have shown more consistent measures of high-volume flows during spring, often at or above flood stage (Seeley M. , 2015).

### Vulnerability

The number of heavy snowfall years for the Midwest has fluctuated between 1900 and 2006. The periods of 1900-1920 and 1960-1985 had numerous years with snowfall totals over the 90<sup>th</sup> percentile. In the past 3 decades, the number of heavy seasonal snowfall totals has been much lower. Despite these generally lower seasonal snowfall totals, some areas of the Midwest have still experienced significant snow totals in the most recent decade. The 100-year linear trends based on decadal values show that the upper Midwest had statistically significant (1% level) upward linear trends in snowstorm frequency from 1901 to 2000 (Kunkel, et al., 2013).

Winter storms affect Olmsted County each year, so there is a 100% probability that the county and its jurisdictions will be affected annually. The amount of snow and ice, number of blizzard conditions, and days of sub-zero temperatures each year are unpredictable and within Olmsted County the vulnerability of jurisdictions to winter storms does not vary geographically. Citizens living in climates such as these must always be prepared for situations that put their lives or property at risk. It is not always the size of the storm or the depth of the cold, but an unprepared individual with a vehicle

breakdown or lack of a personal winter safety kit that are at risk. Rural citizens are more vulnerable to issues with deep snow. The vulnerability of each jurisdiction to severe winter storms has not changed due to any development in the last 5 years.

### Severe Winter Storms and Electrical Outages

The leading cause of electric outages in Minnesota during 2008 to 2013 was Weather/Falling Trees. Between 2008 and 2013, the greatest number of electric outages in Minnesota occurred during the month of March (U.S. Department of Energy, 2015).

### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management also has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

*Snow Removal* – Olmsted County and townships complete the snow removal from all county and township roads. MNDOT will remove the snow from state highways as well as disperse salt/sand as needed.

*School Closings* – The schools have policies and procedures in place for severe weather. Schools use the notification system Rochester Alert, radio, television, and media to send out all notifications when needed.

*Winter Hazard Awareness Week* – Olmsted County participates in this and sends updates through email, Facebook, Twitter, and has conducted presentations for the community.

### Program Gaps or Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as the schools in Olmsted County.

*Above-Ground Power Lines* – Power lines that are above ground are susceptible to coming down during severe winter storms, resulting in power outages. Power lines can come down due to the weight of ice on the lines and trees that have fallen on lines due to heavy snow or ice. Olmsted County monitors the infrastructure of all above-ground power lines. Repairs and replacements are completed as needed. This would include the tower site, conductors, wood or steel poles, and the lines. There are areas that may benefit from burying power lines as a mitigation measure. Olmsted County would work with the appropriate utility companies to identify and address these areas.

#### 4.4.7 Extreme Cold

Winter in Olmsted County can be severe, and especially dangerous for disabled citizens and outdoor workers. Record temperature lows and arctic-like wind chills can cause cold-related illnesses such as

frostbite and hypothermia, which can be deadly. Hypothermia is the greatest and most life-threatening cold weather danger.

In Olmsted County, cold winter weather can have severe or fatal impacts. Hypothermia occurs when the core body temperature drops below 96° F. Anyone who is exposed to severe cold without enough protection can develop hypothermia. Frostbite occurs when skin tissue and blood vessels are damaged from exposure to temperatures below 32° F. It most commonly affects the toes, fingers, earlobes, chin, cheeks, nose, and other body parts that are often left uncovered in cold temperatures. The NWS issues “Extreme cold” warnings when it feels like -30° F or colder across a wide area for several hours. Extreme cold watches are issued a day or two before the conditions are expected.

Medical costs related to extreme heat and cold can be enormous: in 2005 the total was \$1.5 billion nationwide, or more than \$16,000 per patient (Union of Concerned Scientists, 2009).

Below zero temperatures occur almost every winter in Minnesota. January is the coldest month, with daytime highs averaging 20° F and nighttime lows averaging 2° F. However, these averages do not tell the whole story. Maximum temperatures in January have been as high as 61° F and minimums as low as 36° F below zero.

Extreme cold temperatures affect the county nearly every year. Extremely cold air settled over Minnesota on January 31<sup>st</sup> of 1996, and remained entrenched through February 4<sup>th</sup>. A new record low temperature for Minnesota was set in the town of Tower on February 2, 1996, at -60° F. Numerous record low temperatures were set during the period at St. Cloud, Rochester and the Twin Cities. Minneapolis/St. Paul set 3 new record low temperatures as well as recording the 2<sup>nd</sup> coldest day on record on February 2, 1996. A mean temperature of -25° F was measured that day with a high of -17° F and a low of -32° F in the Twin Cities. This was within 2 degrees of tying the all-time record low temperature set in the Twin Cities and the coldest temperature recorded this century. Many central and southern Minnesota locations set new record low temperatures the morning of the 2<sup>nd</sup>. The Governor closed all schools that day.

In February of 2014, nearly all of Minnesota was between 10-15° F colder than normal (1981-2010 period) (High Plains Regional Climate Center, 2014). The winter of 2013-2014 was the sixth coldest on record in Minnesota (The Weather Channel, 2014), with schools in the Twin Cities canceling 5 times in January due to dangerous wind chills. It was the coldest winter in the Twin Cities in 35 years, with an average temperature for December-February of 9.7° F (MN DNR, 2014). Many areas in the state also experienced higher than average precipitation through the winter and spring months.

### Extreme Cold History in Olmsted County

January is the coldest month on average in Rochester, with an average low of 8° F (U.S. Climate Data, 2016). The lowest temperature ever recorded in Rochester occurred in 1887, when it fell to -42° F. January and December are the snowiest months, with January averaging 11.9 inches and December averaging 11.6 inches of snow (Intellicast, 2016).

The National Centers for Environmental information (NCEI) has recorded 22 extreme cold/wind chill since 1996. One death occurred in January of 2016, when an elderly woman passed away from exposure after wandering away from a care facility in Rochester. She left the building early on January 15, while wind chills were near zero and freezing rain was falling, and was found 5 hours later.

### Extreme Cold and Climate Change

There is not yet any observable trend related to extreme cold events and climate change in Minnesota. Cold temperatures have always been a part of Minnesota's climate and extreme cold events will continue. However, an increase in extreme precipitation or storm events such as ice storms as the climate changes could lead to a higher risk of residents being exposed to cold temperatures during power outages or other storm-related hazards during extreme cold.

### Vulnerability

Extreme cold temperatures affect the county nearly every year. The amount of snow and ice, number of blizzard conditions, and days of sub-zero temperatures each year are unpredictable.

Within Olmsted County the risk of extreme cold does not vary geographically. Citizens living in climates such as these must always be prepared for situations that put their lives or property at risk. It is not always the depth of the cold, but an unprepared individual with a vehicle breakdown or lack of a personal winter safety kit that are at risk. Rural citizens not connected to city gas lines are more vulnerable to issues with extreme cold. The vulnerability of each jurisdiction to extreme cold has not changed due to any development in the last 5 years.

### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service), both of which assist in reaching the public with critical information.

*School Closings* – The schools have policies and procedures in place for severe weather. Schools use the notification system Rochester Alert, radio, television, and media to send out all notifications when needed.

*Salvation Army/Red Cross* – Volunteer organizations within the county assist during extreme cold temperatures. They provide shelter, blankets, food, etc. to citizens as needed.

*Severe Weather Awareness Week* – Olmsted County participates in Severe Weather Awareness Week, and sends updates through email, Facebook, and Twitter, as well as conducting presentations for the community.

## Program Gaps and Deficiencies

*Backup Power* – Not all government buildings have backup power generators, such as the schools in Olmsted County. Some schools have backup capabilities and others have none.

### 4.4.8 Extreme Heat

Humans need to maintain a constant body temperature if they are to stay healthy. Working in high temperatures induces heat stress when more heat is absorbed into the body than can be dissipated out. Heat illness such as prickly heat, fainting from heat exhaustion, or heat cramps are visible signs that people are working in unbearable heat. In the most severe cases, the body temperature control system breaks down altogether and body temperature rises rapidly. This is a heat stroke, which can be fatal. The NWS issues a heat advisory when, during a 24-hour period, the temperature ranges from 105° F to 114° F during the day, and remains at or above 80° F at night.

Extreme heat events are linked to a range of illnesses, even death, and can exacerbate pre-existing chronic conditions such as cardiovascular, respiratory, liver, and neurological diseases, endocrine disorders, and renal disease or failure. Populations who are most vulnerable to extreme heat include persons over 65 or under 5 years old; living alone, without air-conditioning, or residing on the topmost floor of a building; and with an income at or below the poverty line. People who are exposed to heat because of recreational or job-related activities are also more vulnerable, including athletes, construction workers, and landscape/agricultural workers (Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team, 2013).

Medical costs related to extreme heat and cold can be enormous: in 2005 the total was \$1.5 billion nationwide, or more than \$16,000 per patient (Union of Concerned Scientists, 2009).

### Extreme Heat History in Olmsted County

July is the hottest month on average in Rochester, with an average high temperature of 81° F (U.S. Climate Data, 2016). The highest temperature ever recorded there occurred in 1936, when it rose to 108° F. Temperatures have also reached into the 90s in April (1980) and October (1997), and a temperature of 78° F was recorded in December of 1908. In May of 1934, temperatures soared to 106° F, and 105° F the following month (Intellicast, 2016).

The National Centers for Environmental Information has recorded 9 instances of extreme heat in Olmsted County since 1999, with deaths reported in 2013 and 1999. During a heatwave at the end of August 2013, one person passed away from heat-related causes in Stewartville, after doing yard work all day. The heat index at the Rochester International Airport was approximately 95° F. During the end of July, 1999, heat indices ranged from 105° F to 120° F across southeast Minnesota, resulting in the death of one woman who died of heat stroke in her mobile home when the inside temperature reached 130° F.

### Extreme Heat and Climate Change

Minnesota's average temperature has increased more than 1.5° F since recordkeeping began in 1895, with increased warming happening in recent decades (International Climate Adaptation Team, 2013).

Annual temperatures in the Midwest have generally been well above the 1901-1960 average since the late 1990s, with the decade of the 2000s being the warmest on record (Kunkel, et al., 2013). 7 of Minnesota's 10 warmest years occurred in the last 15 years. Projected increases are 2° F to 6° F more by 2050 and 5° F to 10° F by 2100 (MN Environmental Quality Board, 2014). The Midwest has experienced major heat waves and their frequency has increased over the last 6 decades (Perera, et al., 2012). For the U.S., mortality increases 4% during heat waves compared with non-heat wave days (Anderson & Bell, 2011). During July 2011, 132 million people across the U.S. were under a heat alert – and on July 20 the majority of the Midwest experienced temperatures in excess of 100° F. Heat stress is projected to increase as a result of climbing summer temperatures and humidity (Schoof, 2012). On July 19, 2011, Moorhead Minnesota set a new state record for the hottest heat index ever, at 134° F. That same day, Moorhead also recorded a new state record for the highest dew point at 88. It was the hottest, most humid spot on the planet that day (Douglas, 2011).

Recent statistics from NOAA show that there are more human fatalities each year due to heat waves than from floods, lightning, tornadoes and winter storms. Many cities have responded by creating Heat Wave Response Plans to ensure that those in marginal health without air conditioning can obtain the relief and care they need, and the Minnesota Department of Health developed the Extreme Heat Toolkit to help educate at-risk populations on how to reduce risks associated with heat waves (Seeley M. , 2015).

Increasing temperatures impacts Minnesota's agricultural industry. Agriculture is highly dependent on specific climate conditions. As a result of increasing temperature, crop production areas may shift to new regions of the state where the temperature range for growth and yield of those crops is optimal. According to the National Climate Assessment, the Midwest growing season has lengthened by almost 2 weeks since 1950 due in large part to earlier timing of the last spring freeze. This trend is expected to continue. While a longer growing season may increase total crop production, other climate changes, such as increased crop losses and soil erosion from more frequent and intense storms, and increases in pests and invasive species, could outweigh this benefit. There may also be higher livestock losses during periods of extreme heat and humidity. Losses of livestock from extreme heat lead to a challenge in the disposal of animal carcasses. Currently there are only 2 rendering facilities in Minnesota available for livestock disposal. If a rendering facility is not available, lost livestock must be composted on an impervious surface. If losses are high, finding an impervious surface large enough is a challenge. In an attempt to adapt to increased temperatures, livestock areas in Minnesota may shift farther north. As a result of new livestock areas and the resulting manure production, farmers may transition to manure-based fertilizer applications in areas where traditionally only commercial fertilizers have been used, with accompanying environmental advantages and disadvantages (Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team, 2013). In order to minimize the detrimental effects of heat stress on animal metabolism and weight gain, Minnesota farmers have also begun redesigning and retrofitting dairy, hog, and poultry barns with better watering, feeding, and ventilation systems (Seeley M. , 2015).

## Vulnerability

Within Olmsted County the risk of extreme heat does not vary geographically. The vulnerability of each jurisdiction to extreme heat has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service), both of which assist in reaching the public with critical information.

*Salvation Army/Red Cross* – Volunteer organizations within the county assist during extreme heat. They provide shelter, food, etc. to citizens as needed.

*Portable Cooling Units* – Olmsted County Public Health will bring out portable cooling units and place them throughout communities where needed.

*Severe Weather Awareness Week* – Olmsted County participates in Severe Weather Awareness Week, and sends updates through email, Facebook, and Twitter, as well as conducting presentations for the community.

*Critical Energy Usage* – Utility companies send out “peak energy alert notifications” asking consumers to reduce energy usage for a certain time frame of major appliances.

## Program Gaps and Deficiencies

*Cooling for Critical Facilities* – Critical facilities in the county and cities that care for vulnerable populations (such as schools and nursing homes) should be encouraged to have air conditioning in place to help provide critical cooling during periods of extreme heat.

### 4.4.9 Drought

A drought refers to an extended period of deficient rainfall relative to the statistical mean for a region. Drought can be defined according to meteorological, hydrological, socioeconomic, and agricultural criteria. Meteorological drought is qualified by any significant deficit of precipitation. Hydrological drought is manifest in noticeably reduced river and stream flow and critically low groundwater tables. The term agricultural drought indicates an extended dry period that results in crop stress and harvest reduction. Socioeconomic drought refers to the situation that occurs when water shortages begin to affect people and their lives. It associates economic goods with the elements of meteorological, agricultural, and hydrological drought. Many supplies of economic goods (e.g., water, food grains, hydroelectric power) are greatly dependent on the weather. Due to natural variations in climate, water supplies are high in some years but low in others. Fluctuating long-term climate variations make drought difficult to predict.

### Drought History in Olmsted County

The National Centers for Environmental Information (NCEI) has recorded 2 droughts in Olmsted County, in May/April of 2012 and November 2012-April 2013. The spring 2012 drought resulted due to below-normal precipitation since May 2011, resulting in severe drought conditions across the western half of the county. Later that year another drought began, persisting until April of 2013.

The hazard rank for drought in Olmsted County is low. A drought may not have a severe impact on human life due to decreased water access; however, the economic impact on farmers can be significant. A drought would also have a detrimental impact on the local economy due to stunting growth of agriculture crops and negative impacts on livestock. Extended drought conditions may also make an area more prone to wildfire. Droughts can also be closely linked with insect infestation. Trees may be lost due to lack of moisture. In severe instances, a drought may cause wells to dry up entirely.

### Drought and Climate Change

Droughts have been happening throughout Minnesota's history and it is not yet clear how climate change may impact this (International Climate Adaptation Team, 2013). While there was no apparent change in drought duration in the Midwest over the past century (Dai, 2011), the average number of days without precipitation is projected to increase in the future (National Climate Assessment Development Advisory Committee, 2013).

Even in areas where precipitation does not decrease, projected higher air temperatures will cause increased surface evaporation and plant water loss, leading to drier soils. As soil dries out, a larger proportion of the incoming heat from the sun goes into heating the soil and adjacent air rather than evaporating its moisture, resulting in hotter summers under drier climatic conditions (Mueller & Seneviratne, 2012).

Across the nation, drought is affecting water supplies, as ground and surface water levels are increasingly reduced due to growing consumption and withdrawal. These trends are expected to continue, with a higher likelihood of water shortages (Georgakakos, et al., 2014).

In 2007, 24 Minnesota counties received drought designation, while 7 counties were declared flood disasters. In 2012, 55 Minnesota counties received federal drought designation at the same time 11 counties declared flood emergencies (MN Environmental Quality Board, 2014).

In May of 2015, over 90% of Minnesota was undergoing severe or moderate drought, due to low snow levels during the 2014-2015 winter and dry spring weather, with precipitation deficits totaling 3-6 inches below average across much of the state since October 2014. Water levels on streams, lakes, and wetlands were below average, and wildfires were common during April of 2015. Blowing soil was also reported due to high winds and the dried-out landscape (MN DNR, 2015).

### Vulnerability

Jurisdictions in Olmsted County do not vary in their vulnerability to drought. The vulnerability of each jurisdiction to drought has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Burning Regulations and Restrictions* – Olmsted County regulates when burning permits can be issued and when there are “burn bans”. If there are dry conditions, a burn ban will be activated.

*Precipitation Monitoring Program* – the Olmsted County Soil and Water Conservation District (SWCD) actively participates as a cooperating agency in the Minnesota State Climatology (MN DNR) Precipitation Monitoring Program. The district has organized a network of volunteers within Olmsted County to monitor precipitation amounts within their townships. Rain gauges are provided by the Board of Water and Soil Resources (BWSR) for volunteers to document daily precipitation measurements which are submitted to the district each month. District staff compiles local data for entry into the state climatology web database and maintains its own county database. Data collections throughout the state are assembled for modeling and prediction of precipitation trends and to monitor weather conditions across Minnesota.

*Minnesota Drought Response Plan* – The State of Minnesota has a statewide drought response plan in place. The plan was prepared by the Minnesota DNR.

## Program Gaps and Deficiencies

*None identified*

### 4.4.10 Wildfire

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human developments are more concentrated. While some wildfires start by natural causes like lightning, humans cause 4 out of every 5 wildfires. Debris burns, arson or carelessness are the leading causes of wildfires. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on national and state forest lands. The dangers from wildfire include the destruction of timber, property and wildlife, and injury or loss of life to people living in the affected area or using the area for recreational facilities.

While wildfires are often viewed in a negative light, they are a naturally occurring part of the environment. Wildfires are an important component of healthy forest and prairie ecology, and can be beneficial by reducing dangerously high fuel levels and putting nutrients into the ground that spur new growth. In addition, many flora species require fire for seed germination. However, as people settled this country and began clearing land and building homes, roads, railroads, and campgrounds, new artificial causes of wildfire emerged and their frequency and level of destruction increased.

Causes of wildfires vary from state to state. For example, in Florida, lightning ignites approximately half of all wildfires, while in Minnesota lightning causes less than 5% of all wildfires. These variations are due to climate, vegetation, topography, and weather. People burning debris cause most wildfires in Minnesota. However, wildfires are also caused by vehicle exhaust, sparks from trains and heavy equipment, camping, smoking and lightning.

Topography affects the movement of air and fire over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity and wind affect the severity and duration of wildfires.

Homes threatened by wildfire are primarily those located in the “wildland-urban interface.” This is the zone where homes and subdivisions have been located in wildland areas where natural wildfires can have an impact. While wildfires are necessary for healthy ecosystems, they burn whatever fuel is in their path, whether vegetation or buildings.

One of the most common causes of a home being damaged or destroyed is due to radiant heat. In a wildfire, radiant heat is the heat given off by burning vegetation. The high temperatures of some wildfires can cause the deck, siding, or roof of a home to ignite, because the fire was too near the home. Studies in western wildfires have shown that approximately 85% of homes surviving a major wildfire had 30-50 feet of defensible space around them, coupled with fire-resistant roofing.

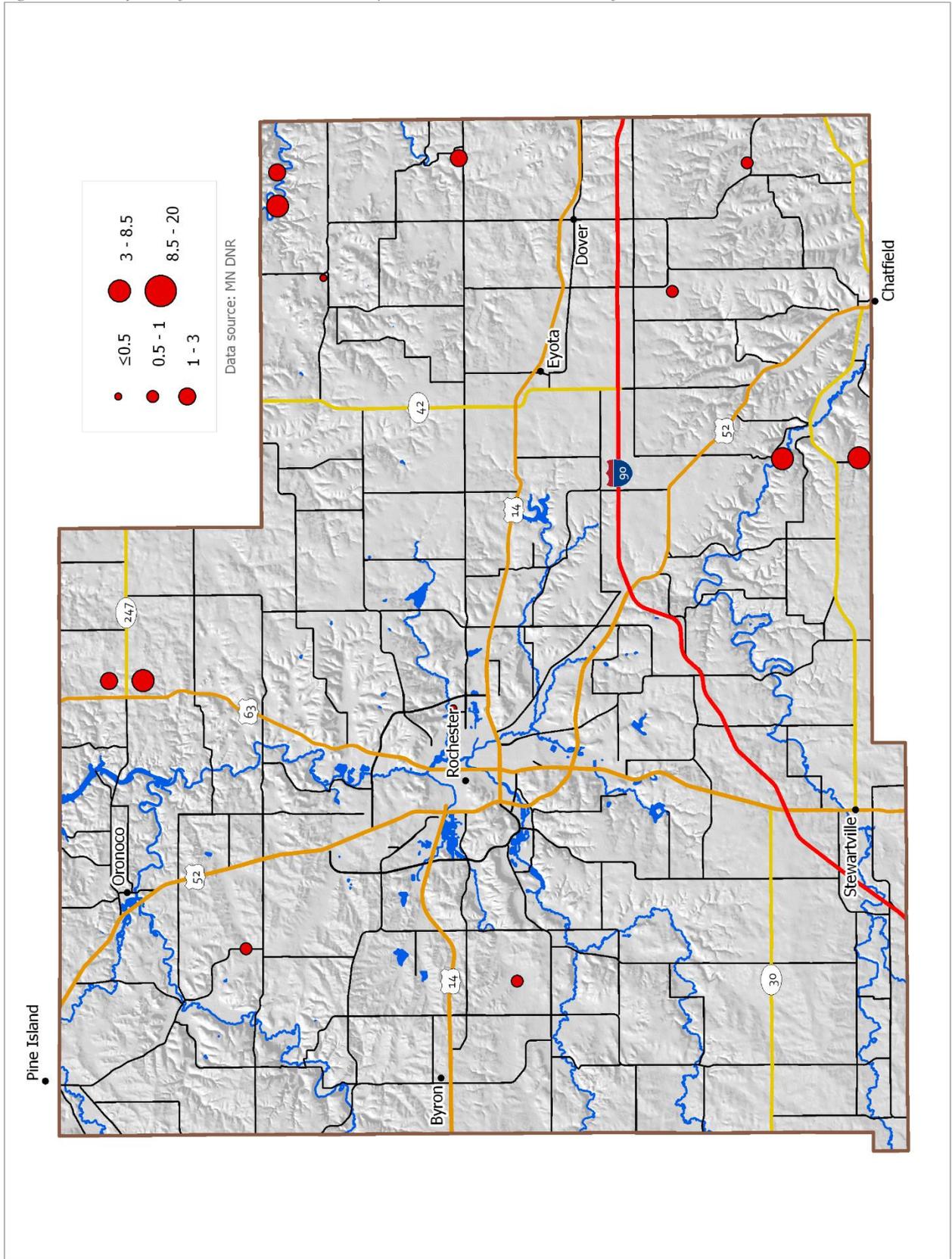
Approximately 1,600 wildfires occurred each year in Minnesota on average from 1976-2011 (MN DNR, 2011). Wildfires occur throughout the spring, summer and fall, however, most wildfires in Minnesota take place in March, April, and May. During this period, much of the existing vegetation has been killed due to winter temperatures and is dead, brown and combustible. Also, there is little green vegetation to serve as a barrier for a moving wildfire.

### Wildfire History in Olmsted County

Wildfire was ranked as a low risk by Olmsted County. Their occurrence is uncommon in the county, the last one recorded by the MN DNR occurring in 2007.

The Minnesota DNR responded to 15 wildfires in Olmsted County between 1985 and April 2015, all of which were human-caused, burning a total of 57 acres. These include fires not only on state lands, but also rural private lands for which there is not another agency with primary responsibility. Wildfires that are not included in this data are those that occur on federal lands and those that are responded to by local fire departments. The largest fire burned 20 acres in 1997 in the southeastern corner of the county. Its cause was the burning of piled debris. These fires are mapped in Figure 24. The DNR has not responded to any fires in Olmsted County since 2007.

Figure 24. Wildfires by Acres Burned (1985-April 2015) in Olmsted County



## Wildfire and Climate Change

Temperatures are predicted to rise in the state, which could lead to more extreme heat events and associated wildfire risks. As Minnesota's climate changes, weather fluctuations between drought and extreme rain events and increasing temperatures will result in changes to forest composition and/or distribution. These fluctuations can lead to dry conditions that may cause increased fire risk in both grassland and forest environments.

## Vulnerability

Jurisdictions in Olmsted County do not vary in their vulnerability to wildfires. The vulnerability of each jurisdiction to wildfire has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service) which both assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Olmsted County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*Burning Regulations and Restrictions* – Olmsted County regulates when burning permits can be issued and when there are "burn bans". If there are dry conditions, a burn ban will be activated.

*Fire Safety in Schools* – Fire safety is taught in schools and wildfires is also a topic that is covered.

*Mutual Aid Agreements* – All county fire departments have a mutual aid agreement if assistance is needed. Written agreements are on file.

*Prescribed Burns* – Every other year, the county/city fire departments assist with the prescribed burns throughout the county. Usually this is done in the spring so conditions are not as dry.

*Fire Prevention Week* – Fire Prevention Week is held annually during the 2<sup>nd</sup> week of October. County and city fire departments participate and provide an opportunity for citizens to learn about fire safety.

*Drafting Devices* – There are dry hydrants/drafting devices around the county that pull water from lakes when fire departments are far away from a hydrant.

*Health Threat* – Olmsted County Public Health has procedures in place if the public is faced with a health threat from smoke. Since smoke is a mixture of gases and fine particles from burning trees and other plant materials and can hurt your eyes, irritate your respiratory system, and worsen chronic heart and lung diseases, Public Health will send out notifications and require an evacuation based on the circumstances.

### Program Gaps or Deficiencies

*Water Access* – Fire hydrants in Olmsted County are all within and hooked up to the municipal systems; thus, the rural areas within the county do not have easy access to water. If fires occur, the only water source in the rural developments is fire departments transporting the water into the area using water trucks. The few dry hydrants within the county are located by large bodies of water to help assist fire departments if needed.

*Firewise Education* – None of the cities within Olmsted County participate in the Firewise Program. An increase in Firewise education for property owners that have properties at risk for fires is needed. Identification and implementation of projects that create perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation is needed to increase defensible space.

*Community Wildfire Protection Plan (CWPP)* – Olmsted County doesn't have a CWPP in place. A CWPP provides a collaborative effort for the identification of areas at risk for wildfires and mitigation strategies to implement by the community and homeowner.

#### 4.4.11 Landslides and Soil Erosion

Erosion is the wearing away of land, such as the loss of a riverbank, beach, shoreline, or dune material. It is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time. Short-term erosion typically results from periodic natural events, such as flooding, hurricanes, storm surges, and windstorms, but may be intensified by human activities. Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sea level rise, sediment loss, subsidence, and climate change. Death and injury are not typically associated with erosion; however, it can destroy buildings and infrastructure (FEMA, 2013).

The movement of a mass of rock, debris, or earth down a slope by the force of gravity is considered a landslide. They occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. Potential impacts include environmental disturbance, property and infrastructure damage, and injuries or fatalities (FEMA, 2013).

#### Soil Erosion/Landslides History in Olmsted County

Some areas of rural Olmsted County have had issues with soil erosion and landslides, though they were not major. However, there is increasing concern about the hazard in the county, particularly with the higher levels of rain they have been receiving.

Soil erodibility (K Factor) is mapped in Figure A - 27.

#### Soil Erosion/Landslides and Climate Change

The increased magnitude and frequency of flooding events and storm activity that may result from climate change may in turn increase the risk of soil erosion and landslides. According to University of

Washington geologist Dave Montgomery, "If the climate changes in a way that we get a lot more rainfall you would expect to see a lot more landslides" (Phillips, 2014).

In Minnesota, the wettest days are getting wetter. This can contribute to increased erosion in many locations due to flooding and saturation of soils. Reduced ice cover on lakes and shorelines (due to warmer temperatures) could potentially expose shorelines to increased erosion or damage during weather events when they previously may have been covered with ice (National Climate Assessment Development Advisory Committee, 2013).

According to the 2014 National Climate Assessment, "Increased precipitation intensity also increases erosion, damaging ecosystems and increasing delivery of sediment and subsequent loss of reservoir storage capacity" (Pryor, et al., 2014).

### Vulnerability

The vulnerability of each jurisdiction to soil erosion and landslides has not changed due to any development in the last 5 years.

### Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service), both of which assist in reaching the public with critical information.

*Emergency Operations Plan (EOP)* – Olmsted County has an EOP, which includes all of the county departments as well as city officials and emergency organizations. The plan is organized to assist with the responsibilities and assignments during any type of emergency.

*SWCD 2017 Operational Plan* – the 2017 plan includes an operational objective for Protection of Natural Resources, which has a specific focus on erosion control education and mitigation measures. Example actions include:

- "Control erosion by promoting upland practices where they apply and assist in their implementation through state and federal cost share programs and providing landowners with technical assistance."
- "Serve as a cooperative technical agency to City and County Townships in conducting plat reviews for all proposed developments with emphasis on controlling runoff, erosion and protecting wetlands."
- "Administer and implement elements of the County Soil Erosion ordinance for suburban development and rural activities."

### Program Gaps and Deficiencies

None identified.

#### 4.4.12 Dam Failure

Dams are structures that retain or detain water behind a large barrier. When full or partially full, the difference in elevation between the water above the dam and below creates large amounts of potential energy, allowing the chance for failure. Dams can fail due to either 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (transportation routes and utility lines required to maintain or protect life), and environmental damage. Dams require constant monitoring and regular maintenance to insure their integrity.

#### Dam Failure History in Olmsted County

Table 27 below summarizes data on Olmsted County's 19 dams based on data from the National Inventory of Dams. They are also mapped in Figure 26. The only dams with Emergency Action Plans are the South Zumbro dams.

Figure 25. Minnesota Avenue Bridge in Oronoco, 2010



During the 2010 floods in Oronoco, the Lake Shady dam gave out and flooded the city (Figure 25), destroying the lake in the process, as it eventually turned into a sediment-filled floodplain. The dam was removed in early 2017 by Olmsted County Environmental Resources, and the river

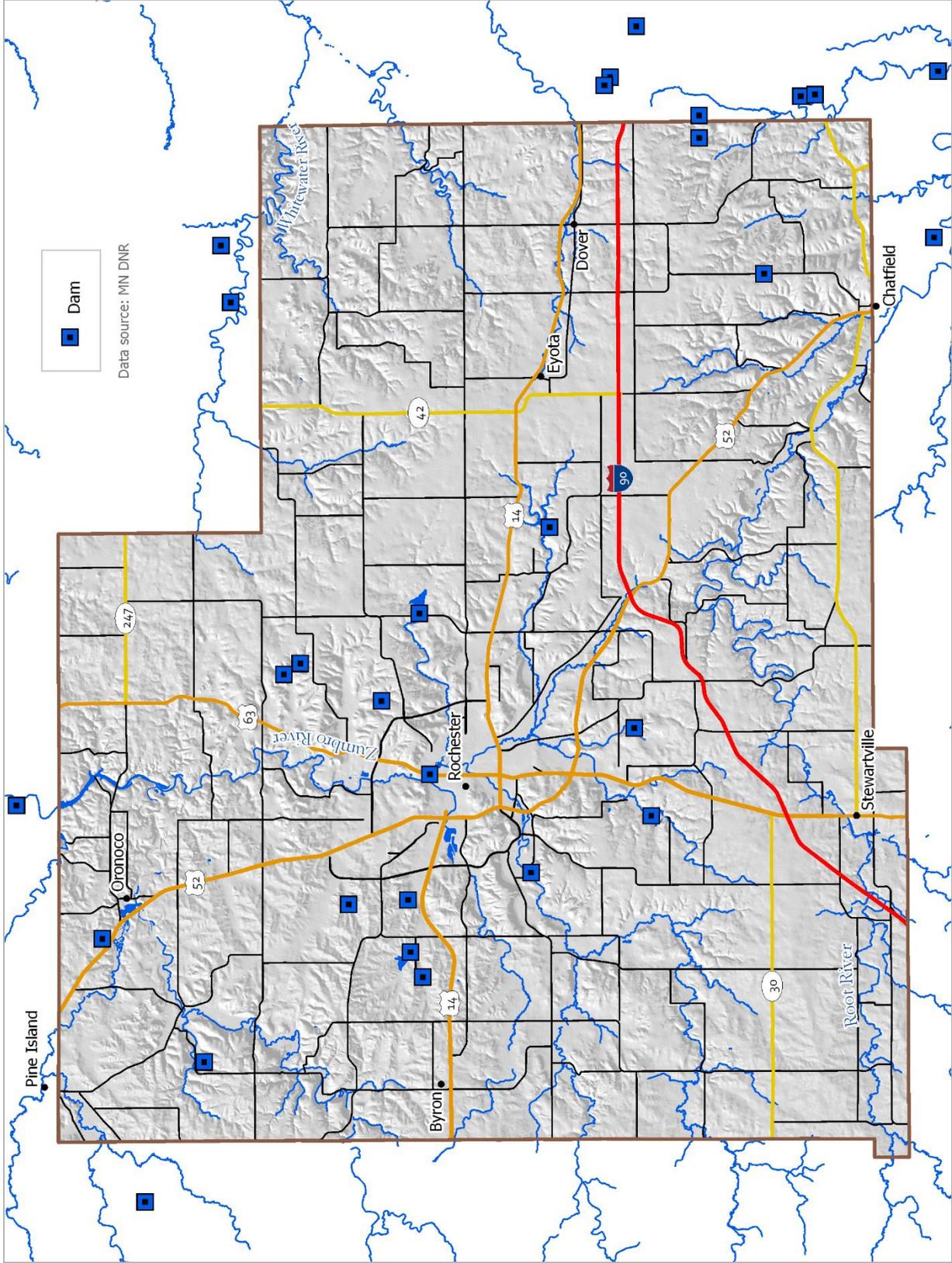
is being restored to a meandered state and the gorge into recreational whitewater.

There are no levees in Olmsted County.

Table 27. Dam Data for Olmsted County (National Inventory of Dams)

Dam Name	Owner	River	Primary Purpose	Year Built	NID Height	Dam Type
City of Rochester, 50 <sup>th</sup> Avenue NW	City of Rochester	South Park River tributary	Flood Control	2007	28'	Earth
Dresser Valley Watershed	John Dreher	Zumbro River offstream tributary	Flood Control	1967	26'	Earth
Elmira 1	N/A	N/A	Flood Control	N/A	39'	Earth
Glen Herman	Glen Herman	N/A	N/A	N/A	26'	N/A
Glen Herman Stabilizer	Glen Herman	Zumbro River offstream tributary	Fire Protection, Stock, or Small Fish Pond	N/A	27'	Earth
Hoehne Bros. Pond	Hoehne Bros.	Zumbro River offstream tributary	Flood Control	1973	35'	Earth
La Moyne Detention	Bruce La Moyne	Zumbro River offstream tributary	Flood Control	1971	29'	Earth
Mayowood Lake	Olmsted County	Zumbro River South Fork	Other	1920	25'	Gravity
Olmsted County Road 10	Olmsted County	Lynch Creek tributary	Other	1978	37'	Earth
Simonson Detention	Jack Polan	Zumbro River offstream tributary	Flood Control	1967	29'	Earth
Sinn Group Str.	Don Sinn	Trout Run	Fish and Wildlife Pond		30'	Earth
South Branch of Zumbro River	City of Rochester	Zumbro River South Fork	Flood Control		30'	Gravity
South Zumbro Br-1	City of Rochester	Bear Creek	Flood Control	1991	75'	Earth
South Zumbro KR-3	City of Rochester	Cascade Creek North Fork	Flood Control	1993	30'	Earth
South Zumbro KR-6	City of Rochester	Cascade Creek tributary	Flood Control	1993	37'	Earth
South Zumbro KR-7	City of Rochester	Cascade Creek North Fork tributary	Flood Control	1994	35'	Earth
South Zumbro SR-2	City of Rochester	Silver Creek	Flood Control	1992	50'	Earth
South Zumbro WR-4	City of Rochester	Willow Creek tributary	Flood Control	1988	46'	Earth
South Zumbro WR-6A	City of Rochester	Willow Creek	Flood Control	1989	56'	Earth

Figure 26. Dams in Olmsted County



## Dam Failure and Climate Change

Dams are designed based on assumptions about a river's annual flow behavior that will determine the volume of water behind the dam and flowing through the dam at any one time. Changes in weather patterns due to climate change may change the expected flow pattern. It is conceivable that bigger rainfalls at earlier times in the year could threaten a dam's designed margin of safety, causing dam operators to release greater volumes of water earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

While climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures. Minnesota had a dam failure due to a large storm event in June 2012. The Forebay canal in Carlton County had operated as designed for nearly 100 years. The intensity of the 2012 rain event caused a failure of the canal wall, which caused significant damage. Climate change is adding a new level of uncertainty that needs to be considered with respect to assumptions made during dam construction.

## Vulnerability

Areas most susceptible to the effects of dam failure are the populated places downstream from a dam location. The vulnerability of each jurisdiction to dam failure has not changed due to any development in the last 5 years.

## Plans and Programs in Place

*Public Information and Warning* – Rochester Alert is the IPAWS system used by Olmsted County to send out notifications to the public during emergencies in a timely manner. This can be area-specific if needed. Olmsted County Emergency Management has an official Facebook page as well as a Twitter page. The Olmsted County Sheriff's Office also has a Facebook page, which is used to send out information to the public. Olmsted County has a good relationship with the media and NWS (National Weather Service), both of which assist in reaching the public with critical information.

*Federal Emergency Management Agency (FEMA) National Dam Safety Program* – For 30 years, the federal government has used the National Dam Safety Program (NDSP) to protect Americans from dam failure. The NDSP is a partnership of states, federal agencies, and other stakeholders that encourage individual and community responsibility for dam safety. The NDSP is intended to help states bring the necessary resources to bear on inspection, classification, and emergency planning for dam safety.

*National Inventory of Dams (NID)* – The NID is a database managed by the Army Corps of Engineers. The NID is used to track information on the nation's water control infrastructure. Information from the NID is used in the development of water resource management, land use management, floodplain management, risk management, and emergency action planning.

*Minnesota Department of Natural Resources, Division of Waters – Dam Safety Program* – The MN DNR Dam Safety Program and current dam safety regulations require the safe design, construction, operation, and maintenance of dams in Minnesota. The state program includes review of design plans

and plans for proposed dams, safety inspections of existing dams, and repair of dams. The Dam Safety Program keeps a file on all dams that are subject to state dam safety regulations or have had information or reports generated on them for another purpose. A typical file contains construction plans, photos, inspection reports, and correspondence.

*U.S. Army Corps of Engineers* – The U.S. Army Corps of Engineers has plans in place for terroristic acts against the dams and flood control projects in the county.

### Program Gaps and Deficiencies

*None identified.*

## Section 5 – Mitigation Strategy

The goal of mitigation is to protect lives and reduce the future impacts of hazards including property damage, disruption to local and regional economies, the amount of public and private funds spent to assist with recovery, and to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment, provided in Section 4 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community's needs.

### 5.1 Community Capability Assessments

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities. Appendix J lists the plans and programs in place in Olmsted County as related to hazard mitigation. As part of the Olmsted County MHMP update, the County, its cities, and townships were asked to participate in filling out a "Local Mitigation Capabilities Assessment" (LMCA) form to report on their current mitigation capabilities and program gaps. Appendix K lists the LMCA reports gathered for Olmsted County.

#### 5.1.1 National Flood Insurance Program (NFIP)

The NFIP is a federal program created by Congress to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally-backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses.

Olmsted County received notice in October 2016 of the publication of the new Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS). The Planning Department received the pending floodplain maps in early December. The effective date for the FIRM and FIS is April 19, 2017 (Olmsted County, 2016).

Table 28 below shows which jurisdictions in Olmsted County participate in the National Flood Insurance Program (NFIP). Only the city of Byron is not participating in the NFIP; however, the city does not have FEMA mapped high-risk areas.

Table 28. NFIP Participation in Olmsted County

Jurisdiction Name	NFIP y/n	FEMA Mapped High-Risk Areas
Olmsted County	Yes	Yes
Byron	No	No
Chatfield	Yes	Yes
Dover	Yes	Yes
Eyota	Yes	Yes
Oronoco	Yes	Yes
Pine Island	Yes	Yes
Rochester	Yes	Yes
Stewartville	Yes	Yes

Data current as of Aug. 17, 2016 (FEMA, Community Status Book Report: Minnesota, 2016)

Repetitive loss properties are defined as properties that have had 2 or more flood insurance claims of \$1,000 or more in any rolling 10-year period. Property owners are asked to consider mitigation activities such as acquisition, relocation, or elevation, among other options. FEMA's Repetitive Loss (RL) properties strategy is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties. Property owners are notified of their status by FEMA.

For more on the areas that flood repeatedly in Olmsted County, see Section 4.4.5 *Flash Flood and Riverine Flood*.

### 5.1.2 Plans and Ordinances

Olmsted County and its incorporated communities have a number of plans and ordinances in place to ensure the safety of residents and the effective operation of communities, including a Zoning Ordinance, Floodplain Ordinance, Emergency Operations Plan, Capital Improvements Plan, and Water Management Plan. In Section 4.4 of this plan (*Hazard Profiles*) a review of the plans and programs in place was included as related to each of the hazards addressed in the plan. See Appendix J for a list of all plans and programs in place in Olmsted County, and Appendix K for the local mitigation capabilities assessment reports.

## 5.2 Mitigation Goals

In Section 4.0 of this plan, the risk assessment identified Olmsted County as prone to a number of natural hazards. The steering committee members understand that although hazards cannot be eliminated altogether, Olmsted County can work toward building disaster-resistant communities.

The goals and strategies being developed for the 2019 Minnesota State Hazard Mitigation Plan for natural hazards were adopted for use in the Olmsted County Plan (Table 29). This framework will allow for integration of the mitigation actions that are listed by Olmsted County and its jurisdictions into the state plan. The state will then be able to develop a statewide strategy that will benefit all of Minnesota.

Table 29. Goals that will be used in the 2019 Minnesota State Hazard Mitigation Plan

<b>Flooding Goal:</b> Reduce deaths, injuries, property loss and economic disruption due to all types of flooding (riverine, flash flooding, dam/levee failure)
<b>Wildfire Goal:</b> Reduce deaths, injuries, property loss, natural resource and economic disruption due to wildfire (forest, prairie, grass, and peat bogs).
<b>Windstorms Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to windstorms.
<b>Severe Winter Storms Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to severe winter storms (blizzard, ice, and ice storm).
<b>Lightning Goal:</b> Reduce deaths, injuries, property losses, loss of services, and economic disruption due to lightning.
<b>Tornado Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to tornadoes.
<b>Drought Goal:</b> Reduce economic loss and environmental impacts due to drought
<b>Extreme Heat Goal:</b> Reduce deaths, injuries, and economic disruption due to extreme heat.
<b>Extreme Cold Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to extreme cold.
<b>Landslide/Erosion Goal:</b> Reduce deaths, injuries, property loss, and economic disruption due to extreme cold.

### 5.3 Mitigation Action and Project Strategies

The mitigation actions in this plan are summarized into 4 main strategy types, as described in the FEMA publications *Local Mitigation Planning Handbook* (2013) and *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* (2013). Also included are the new FEMA Climate Resilient Mitigation Actions (CRMA) released in 2016. Minnesota HSEM recommends the use of these mitigation strategies to be in alignment with the state plan and those recommended by FEMA. A fifth strategy type was determined by Minnesota HSEM for use within the state. They are listed in Table 30 below:

Table 30. Mitigation Strategies and Action Types

Mitigation Strategy	Description	Example Mitigation Actions
Local Plans and Regulations	These actions include government authorities, policies, or codes, that influence the way land and buildings are developed and built.	<ul style="list-style-type: none"> <li>• Comprehensive plans</li> <li>• Land use ordinances</li> <li>• Planning and zoning</li> <li>• Building codes and enforcement</li> <li>• Floodplain ordinances</li> <li>• NFIP Community Rating System</li> <li>• Capital improvement programs</li> <li>• Open space preservation</li> <li>• Shoreline codes</li> <li>• Stormwater management regulations and master plans</li> </ul>

Mitigation Strategy	Description	Example Mitigation Actions
Structure and Infrastructure Projects	<p>These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure.</p> <p>This type of action also involves projects to construct manmade structures to reduce the impact of hazards.</p> <p>Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.</p>	<ul style="list-style-type: none"> <li>• Acquisitions and elevations of structures in flood prone areas</li> <li>• Utility undergrounding</li> <li>• Structural retrofits</li> <li>• Floodwalls and retaining walls</li> <li>• Detention and retention structures</li> <li>• Culverts</li> <li>• Safe rooms</li> </ul>
Natural Systems Protection	<p>These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.</p>	<ul style="list-style-type: none"> <li>• Sediment and erosion control</li> <li>• Stream corridor restoration</li> <li>• Forest management</li> <li>• Conservation easements</li> <li>• Wetland restoration and preservation</li> </ul>
Education and Awareness Programs	<p>These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.</p>	<ul style="list-style-type: none"> <li>• Radio or television spots</li> <li>• Websites with maps and information</li> <li>• Real estate disclosure</li> <li>• Presentations to school groups or neighborhood organizations</li> <li>• Mailings to residents in hazard-prone areas.</li> <li>• StormReady</li> <li>• Firewise Communities</li> </ul>
Mitigation Preparedness and Response	<p>This is a State of Minnesota mitigation strategy with the intent of covering preparation and actions that protect life and property during a natural disaster.</p>	<ul style="list-style-type: none"> <li>• Emergency operations plan</li> <li>• Flood fight plans and preparedness</li> <li>• Dam emergency action plans</li> <li>• Warning</li> <li>• Backup power</li> <li>• Emergency capabilities</li> </ul>

In the review and discussion of selected mitigation strategies and actions, steering committee members and the public were asked to consider the ranking of mitigation actions by priority for implementation. Guidance for ranking mitigation activities is drawn from FEMA evaluation criteria. The evaluation criteria (STAPLE+E) included the following categories and questions:

**Social:**

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

**Technical:**

- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

**Administrative:**

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

**Political:**

- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

**Legal:**

- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation strategy address continued compliance with the NFIP?

**Economic:**

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be "tabled" for implementation until outside sources of funding are available?

**Environmental:**

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

**5.3.1 Hazard Mitigation Actions**

Olmsted County and its included municipalities share a common Multi-Hazard Mitigation Plan and worked closely to develop it. Local leaders work together with the Olmsted County Emergency Management Director to assure that the hazards and mitigation actions included in this plan are accurate and addressed in their jurisdictions. The jurisdictions responsible for each action are: Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, Stewartville, and Olmsted County.

Table 32 lists all mitigation actions for Olmsted County and its jurisdictions. Appendix G contains separate mitigation action tables for each jurisdiction. Each of these mitigation action charts detail the hazard, the mitigation strategy and action to address it, the priority ranking for implementation (1 = High Priority; 2 = Moderate Priority; 3 = Low Priority, see Table 31), its current stage of implementation, the timeframe for implementation going forward, the jurisdictions who have identified they will work to implement the action, the responsible parties to carry through with implementation, and comments on how the plan will be implemented through existing planning mechanisms and potential funding to make implementation happen.

Table 31. Criteria for Mitigation Action Priority Ranking

Ranking	Criteria
High Priority (1)	<ul style="list-style-type: none"> <li>• Methods for reducing risk from the hazard are technically reliable.</li> <li>• The County has experience in implementing mitigation measures.</li> <li>• Mitigation measures are eligible under federal grant programs.</li> <li>• There are multiple mitigation measures for the hazard.</li> <li>• The mitigation measure(s) are known to be cost effective.</li> <li>• The mitigation measures protect lives and property for a long period of time, or are permanent risk reduction solutions.</li> </ul>
Moderate Priority (2)	<ul style="list-style-type: none"> <li>• Mitigation methods are established.</li> <li>• The County has limited experience with the kinds of measures that may be appropriate to mitigate the hazard.</li> <li>• Some mitigation measures are eligible for federal grants.</li> <li>• There is a limited range of effective mitigation measures for the hazard.</li> <li>• Mitigation measures are cost-effective only in limited circumstances.</li> <li>• Mitigation measures are effective for a reasonable period of time.</li> </ul>
Low Priority (3)	<ul style="list-style-type: none"> <li>• Methods for reducing risk from the hazard are not well-established, are not proven reliable, or are experimental.</li> <li>• The State or Counties have little or no experience in implementing mitigation measures, and/or no technical knowledge of them.</li> <li>• Mitigation measures are ineligible under federal grant programs.</li> <li>• There is a very limited range of mitigation measures for the hazard, usually only one feasible alternative.</li> <li>• The mitigation measure(s) have not been proven cost effective and are likely to be very expensive compared to the magnitude of the hazard.</li> <li>• The long-term effectiveness of the measure is not known, or is known to be relatively poor.</li> </ul>

Mitigation actions that have been completed or deleted from the 2009 Olmsted County Multi Hazard Mitigation Plan are identified and reported on in Appendix H. Completed and deleted mitigation actions are not carried over into the updated mitigation action chart.

In addition to ranking the hazard mitigation actions using STAPLE+E, the steering committee also reports on the status of the mitigation action. Completed and deleted mitigation actions are denoted in Appendix H. Ongoing mitigation actions from the initial review were incorporated into annual reviews by the mitigation team. The status designations are:

- New – New actions that have been identified since the last plan
- Ongoing – Actions from the last plan that require continuing application
- In Progress – Actions from the last plan that are currently being acted upon

The mitigation types are defined as follows:

- Local Planning and Regulations
- Structure and Infrastructure Projects
- Natural Systems Protection
- Education and Awareness Programs
- Mitigation Preparedness and Response Support

Table 32. Olmsted County Master Mitigation Action Chart (2017-2021)

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/ City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/ City budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
3	All-Hazards	Education & Awareness Programs	Provide outreach to the hospitality industry and visitors to the area with education and awareness on natural hazards in the County.	New	Moderate	2017-2021	Olmsted County Byron Eyota Stewartville	OC Emergency Management and Public Health in collaboration with local cities.	Local CVBs and tourism bureaus are encouraged to sign up for OC Emergency Management social media (Facebook/ Twitter) to receive information. OC will coordinate with the City of Rochester on this effort.	County/ City budgets
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/ City budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Mitigation Preparedness & Response Support	Collect and update critical data of use for OC emergency management and incorporate into annual Emergency Operations Plan updates as appropriate.	Ongoing	High	2017-2021	Olmsted County Byron Oronoco Pine Island	OC Emergency Management and OC Public Health	This is a standing effort of the OC Emergency Management Program. OC Public Health also has an All-Hazards Response Plan.	County Budget
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/ City budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/ City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service's annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC's Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/ City budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
9	Severe Winter Storms / Summer Storms	Structure and Infrastructure Projects	Identify aboveground power lines vulnerable to failure during severe ice storm or wind events and work with public utilities to evaluate/implement mitigation projects such as hardening or burying of power lines as needed.	New	High	2017-2021	Olmsted County Byron Chatfield Stewartville	OC Public Works and Electric Coops (People's Energy Cooperative /Xcel Energy)	OC will work with electric utilities to identify areas of the county in which overhead distribution and transmission power lines are more susceptible to ice build-up, wind, or other damage during storms and develop options to mitigate the exposure to damage and/or the shortening of restoration of service time.	Energy Coop Funding <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island Stewartville	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/ City budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/ City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain "Storm Ready" community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/ City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County Chatfield Dover Eyota Pine Island Stewartville	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/ City Budgets
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide "Storm Spotter" training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/ City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the "heat island" effect.	County/ City Budgets
16	Extreme Temps (Heat / Cold)	Education & Awareness Programs	Provide outreach & education to vulnerable populations in the community (i.e., senior citizens, young adults) on personal safety measures to take during periods of extreme heat / cold.	New	High	2017-2021	Olmsted County Byron Eyota Stewartville	OC Emergency Management, OC Public Health, and OC Community Services in collaboration with local cities.	OC Public Health sends out an advisory notice directly to Mobile Home Park operators within the County during periods of extreme heat to alert them of the dangers of extreme heat for MHP residents, and the need to provide cooling shelter if it is available.	County/ City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/ City Budget

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/ City budgets
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/ City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
20	Flooding	Structure and Infrastructure Projects	Upgrade existing rain gauges in certain areas of the County (NW of the County and Oxbow Park).	New	Moderate	2017-2021	Olmsted County Byron Eyota	OC SWCD & Public Works	Olmsted SWCD has a rain gauge network where volunteers collect precipitation information daily and submit to the county and state monthly. The SWCD can seek additional volunteers to expand the precipitation monitoring network into strategic locations that assist with modeling and trend analysis.	County Budgets, other state or local funding
21	Flooding	Structure and Infrastructure Projects	Work with Dodge County to install rain gauges on the Zumbro River to help prevent flooding in OC.	New	Moderate	2017-2021	Olmsted County Pine Island	OC Env. Resources	OC will work to coordinate with Dodge County and the City of Pine Island on funding for new monitors as well as maintenance on current system.	Dodge County, OC Funding <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
22	Flooding	Structure and Infrastructure Projects	Install flood warning gauges on streams in critical areas of the County that can be remotely read and integrated in advance warning systems.	New	Moderate	2017-2021	Olmsted County Stewartville	OC SWCD, OC Public Works & Env. Resources	SWCD, DNR and state climatology office to locate existing gauges and establish new ones into strategic locations that assist with flood modeling and trend analysis. Olmsted County will confer with the local MN DNR hydrologist to determine possible funding (i.e., USGS, DNR, or HSEM).	County Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
24	Flooding	Local Planning & Regulations / Natural Systems Protection	Continue to update and implement existing plans (i.e., South Zumbro CIP) to help reduce long-term vulnerability of flooding and erosion to key waterways.	New	Moderate	2017-2021	Olmsted County Byron Stewartville	OC SWCD and OC Env. Resources	Identify and prioritize key best management practices through the County Water Plan and future One Watershed, One Plan (1W1P) process that store water on the landscape and reduce peak flows.	County Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
25	Flooding	Natural Systems Protection	Identify and implement habitat restoration projects along the Zumbro River that will help reduce flooding by providing temporary storage within the river corridor.	New	Moderate	2017-2021	Olmsted County Byron Oronoco	OC Env. Resources, OC SWCD	SWCD could work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established or implementation of best management practices that store water on the land and reduce peak flows.	County Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA funding for Flood Diversion &amp; Storage</b>
26	Flooding	Local Planning & Regulations	Work with private landowners (farmers) to obtain easements for water storage on their property to help reduce prolonged flood duration in cropland areas.	New	Moderate	2017-2021	Olmsted County Byron Eyota Pine Island	OC SWCD and OC Env. Resources	SWCD can assist with identifying landowners, operators and locations where best management practice may be most effective in reducing impacts of flooding.	County Budgets, MN Board of Water and Soil Resources (BWSR), and Farm program funding

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
28	Flooding	Local Planning & Regulations	Investigate participation in the NFIP's "Community Rating System" (CRS) that would affect flood insurance rates.	Ongoing	Moderate	2017-2021	Olmsted County Dover Pine Island Oronoco Stewartville	Rochester-Olmsted Planning Dept.	Once new floodplain maps are adopted, OC will review participation in the CRS.	County Budgets
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
30	Flooding	Local Planning & Regulations	Map all properties covered by Letters of Map Amendment and Letters of Map Revision. (Those LOMR's that list properties but do not amend the FIRM panel.)	In Progress	High	2017	Olmsted County Dover Stewartville	Rochester-Olmsted Planning Dept.	This is a standing procedure of OC Planning and Zoning.	County Budgets
31	Flooding	Local Planning & Regulations	Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events.	Ongoing	Moderate	2017-2021	Olmsted County Byron Dover Pine Island Stewartville	Rochester-Olmsted Planning Dept., OC Public Works, and OC SWCD	OC Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit. OC will work to coordinate with local cities on this. Effects of not doing so may result in flooding in Rochester.	County Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
32	Flooding	Education & Awareness Programs	Develop educational materials and promote shoreland buffer vegetation Best Management Practices, and monitoring.	Ongoing	Low	2017-2021	Olmsted County Dover Eyota Stewartville	OC SWCD	Recently the State of MN adopted new policies that OC will need to enforce. SWCD is a key player.	County Budgets
33	Flooding	Local Planning & Regulations	Identify measures to limit infiltration to the Dover and Eyota portions of the Dover/Eyota/St. Charles sewer system.	In Progress	High	2017-2021	Olmsted County Eyota Dover Pine Island	Rochester-Olmsted Planning Dept. and City of Eyota Admin / Public Works	The City of Eyota is in phase 2 of 3 in having all concrete curbs, gutters, and larger storm drains. There is still flooding in the City of Eyota and in houses but they are working on it.	County/City Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
35	Erosion, Landslides & Karst	Local Planning & Regulations, Natural Systems Protection	Develop a model ordinance for use in every community in the county that will minimize disturbance and avoid the development of certain areas that are unstable due to soils and/or geologic formation.	In Progress	Low	2017-2018	Olmsted County	Rochester-Olmsted Planning Dept. and SWCD	The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. This is a part of the OC Water Plan.	County Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
36	Erosion, Landslides & Karst	Local Planning & Regulations, Natural Systems Protection	Conduct a study of unstable slopes and an inventory of areas in the county. Develop a plan to address unstable slopes particularly near public roads and other critical facilities.	Ongoing	High	2017-2021	Olmsted County	Rochester-Olmsted Planning Dept. and SWCD	The Rochester Olmsted Council of Governments (ROCOG) has reaffirmed the 2040 Long Range Transportation Plan that covers the OC area. This plan is federally required to be compared to available state or local conservation plans, maps and inventories for purposes of assessing potential areas of impact early in the planning process. As such, it keeps such things as floodplains, steep slopes, and erodible soils in mind when planning for the area's transportation network. It is updated every five years.	County/City Budgets <b>Possible FEMA HMA Funding for Soil Stabilization Projects</b>

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
37	Erosion, Landslides & Karst	Local Planning & Regulations	Create new standards in the OC Zoning Ordinance to address karst features and protection of the groundwater system in the county.	In Progress	Moderate	2017-2021	Olmsted County Byron	Rochester-Olmsted Planning Dept., OC Env. Resources, and SWCD	OC Planning will work in coordination with SWCD & Environmental Resources to address planning for new standards in the ordinance to address karst impact on groundwater supply.	County Budgets
38	Wildfire	Mitigation Preparedness & Response Support	Identify rural areas vulnerable to wildfire and not in proximity to a water source to assist in fire suppression. Evaluate projects such as installation of underground water tanks to help assist fire departments if needed.	New	High	2017-2021	Olmsted County	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with local fire departments on this effort.	County Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
39	Wildfire	Education & Awareness Programs	Increase Firewise education and training for property owners that have properties at-risk for wildfire (i.e., Provide Level-1 Assessments for Defensible Space around structures.)	New	Low	2017-2021	Olmsted County	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	County Budgets
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for "wildland" fires in Olmsted County. OC Emergency Management will use its website, Facebook/ Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
41	Wildfire	Education & Awareness Programs / Local Planning & Regulations	Encourage public or private property owners (such as landowners, parks or campgrounds) to incorporate defensible space and fuels reduction around new or existing structures that may be at-risk of wildfire. Incorporate into local building codes as appropriate.	New	High	2017-2021	Olmsted County Byron Pine Island Stewartville	OC Emergency Management, OC Public Works, and local fire depts.	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	<b>Possible FEMA HMGP or PDM funding for Defensible Space or Fuels Reduction</b>
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Eyota Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
44	Drought	Local Planning & Regulations	Strengthen water conservation measures in the building code for each jurisdiction by educating the public and contractors.	Ongoing	Moderate	2017-2021	Olmsted County Byron Eyota Stewartville	Rochester-Olmsted Planning Dept.	Local governments will address water conservation measures in scheduled updates for land use and ordinances.	County/City Budgets
45	Drought	Local Planning & Regulations	Encourage the development of a response plan that addresses the needs of agriculture during a severe drought.	Ongoing	Low	2017-2021	Olmsted County Dover Eyota	OC Emergency Management in collaboration with SWCD	OC is working with the USDA Farm Service Agents and Soil and Water divisions.	County/City Budgets

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets
47	Dam Failure	Structure & Infrastructure Projects	Continue to work with private dam owners to monitor condition of flood control project dams and address maintenance as needed.	Ongoing	Moderate	2017-2021	Olmsted County	OC Emergency Management, and OC Env. Resources, SWCD & (Farm Dams)	Olmsted County Environmental Resources periodically monitors the water quality of the public and private reservoirs. Olmsted County Public Works and City of Rochester Public Works each monitor the flood control dams.	County Budget, MN DNR funding

#	Hazard	Mitigation Strategy	Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County Comments on Planning Mechanisms for Implementation	Possible Funding
48	Dam Failure	Education & Awareness Programs	Provide education to residents and businesses that are located downstream from dams with safety-awareness during high rain events.	New	Moderate	2017-2021	Olmsted County	OC Emergency Management, and OC Env. Resources	OC Emergency Management will promote awareness of possible flooding due to dam releases.	County Budget

### **5.3.2 Mitigation Actions by Community**

This plan is a multi-jurisdictional plan that covers Olmsted County, its school districts and the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville. The Olmsted County risks and mitigation activities identified in this plan also incorporate the concerns and needs of townships and other entities participating in this plan.

Mitigation actions are separated by jurisdiction in Appendix G.

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## Section 6 – Plan Maintenance

### 6.1 Monitoring, Evaluation, and Updating the Plan

The Olmsted County Multi-Hazard Mitigation Plan (MHMP) should be considered a living document. The plan should be updated and approved by FEMA at a minimum of every 5 years. The guidance in this section will function as the primary tool when reviewing progress on the implementation of the Olmsted County MHMP.

The Olmsted County Emergency Management Director is the individual responsible for leading all efforts to monitor, evaluate, and update the hazard mitigation plan within the 5-year window. Throughout the 5-year planning cycle, the Olmsted County Emergency Management Director will convene planning team members from the County and each jurisdiction on an annual basis to monitor, review, evaluate, and update the Multi-Hazard Mitigation Plan. Feedback will be gathered on actions that have been completed or ideas for future mitigation actions that should be incorporated into the next update of the plan. This will be done during the 4<sup>th</sup> quarter of each year to coincide with annual update to the County's Emergency Operations Plan (EOP). Additional stakeholders will be added based on need. If needed, the Olmsted County Emergency Management Director will convene the group to meet on a more regular basis to monitor plan implementation progress and reassess needs and opportunities. This could be done annually, or in response to funding cycles of programs that provide resources for hazard mitigation activities. If there is a need for a special meeting due to new developments or a declared disaster occurring in the county, the team will meet to update pertinent mitigation strategies. Depending on Olmsted County opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the MHMP goals and objectives to determine their relevance to changing situations in Olmsted County. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the 5-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by county commissioners.

### 6.2 Implementation

Olmsted County and its included municipalities share a common Multi-Hazard Mitigation Plan and work together closely to develop, revise, and implement it. This MHMP provides a comprehensive chart of mitigation actions for Olmsted County and its jurisdictions (see Section 5.3.1, *Hazard Mitigation*

*Actions*). Jurisdictions participated in the MHMP planning process and identified the specific mitigation strategies and actions that they would seek to implement in their communities during the 5-year planning cycle. These mitigation actions are provided in *Appendix G: Mitigation Actions by Jurisdiction*.

A number of implementation tools are available to address hazards. Many of these tools are below, however, in some cases additional discussion is needed in order to identify what strategies are most appropriate to use. This will be part of an ongoing discussion as Olmsted County looks for opportunities for plan implementation. The following tools will be considered:

- **Education:** In many cases education of residents has been identified as one of the most effective mitigation strategies.
- **Capital Investments:** Capital investments such as fire and ambulance equipment, sprinkler systems and dry hydrants are tools that can limit risks and impacts of natural hazards.
- **Data Collection and Needs Assessments:** Data collection and needs assessments can aid in gaining a better understanding of threats and allow planning for mitigation strategies accordingly. As resources are limited for this part of the planning process, additional data collection is likely to be an ongoing activity as resources become available.
- **Coordination:** Responsibilities for mitigation strategies run across various county departments, local fire and ambulance departments, city and township governments, and a host of state and federal agencies. Ongoing coordination is an important tool to ensure resources are used efficiently. Coordination can also avoid duplication of efforts or prevent gaps that are created because of unclear roles and responsibilities. The mitigation plan review process can function as a tool to have an ongoing discussion of roles, responsibilities, and opportunities for coordination.
- **Regional Cooperation:** Counties and public safety services providers throughout the region often share similar challenges and concerns. In some cases, a regional approach may be warranted as a mitigation strategy in order to save resources. Mutual aid agreements are a tool already in use for a number of services. Needs assessments for fire and ambulance services and development of assistance for volunteer recruiting, training, and retention could benefit from a regional approach. Cooperation among counties could also help in lobbying for certain funding priorities that address concerns relating to challenges in service delivery in rural areas. Organizations such as FEMA Region V and the MN Department of HSEM through the Regional Program Coordinator can offer tools and resources to assist in these cooperative efforts.
- **Regulation:** Regulation is an important mitigation tool for Olmsted County. Regulation plays a particularly important role for land use, access to structures and the protection of water resources and public health.

### 6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the Multi-Hazard Mitigation Plan (MHMP). The Olmsted County Emergency Management Director and the steering committee members from the participating jurisdictions of the cities of Byron, Chatfield, Dover, Eyota,

Oronoco, Pine Island, and Stewartville will continue to engage new public stakeholders in planning discussions and project implementation during the 5-year cycle of this plan.

In order to seek continued public participation after the plan has been approved and during the 5-year window of implementation for this plan, the County will take the following measures:

- The plan will be posted on the Olmsted County website for the public to read and provide feedback. Collected feedback will be reviewed and the plan will be amended as necessary.
- Information will regularly be posted on the Olmsted County Emergency Management Facebook Page on current mitigation projects and topics and public feedback will be encouraged.
- Following major storms or natural disasters, Olmsted County Emergency Management will seek to gather concerns and new ideas for mitigation from local residents to include in the next update of the plan. This may be done through public meetings or news releases via local media (online, newspaper, radio).
- Each city participating in the plan will be responsible to keep their city councils, city departments, schools, and community members updated and engaged in the implementation of their respective mitigation action charts (see *Appendix G: Mitigation Actions by Jurisdiction*). Each respective jurisdiction will report their progress in this area to the Olmsted County Emergency Management Director.
- Jurisdictions will use numerous means of public outreach to engage new public stakeholders in providing input on mitigation efforts or concerns on hazards by sharing information at city council meetings and special events, working with local schools and partner organizations, and posting information on relevant local or social media that their communities use to inform and engage the public. As mitigation projects are implemented, jurisdictions will work to keep the public updated and engaged in those local efforts.

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# APPENDICES

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- Appendix B – Olmsted County Critical Facilities
- Appendix C – Olmsted County Hazard Events
- Appendix D – Adopting Resolutions
- Appendix E – Steering Committee Meetings
- Appendix F – Public Outreach & Engagement Documentation
- Appendix G – Mitigation Actions by Jurisdiction
- Appendix H – Past Mitigation Action Review Status Report (2009-2016)
- Appendix I – Works Cited
- Appendix J – Olmsted County Plans & Programs In Place
- Appendix K – Local Mitigation Capabilities Assessment Report

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# Appendix A

## Olmsted County Maps

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Figure A - 1. Hydrography of Olmsted County

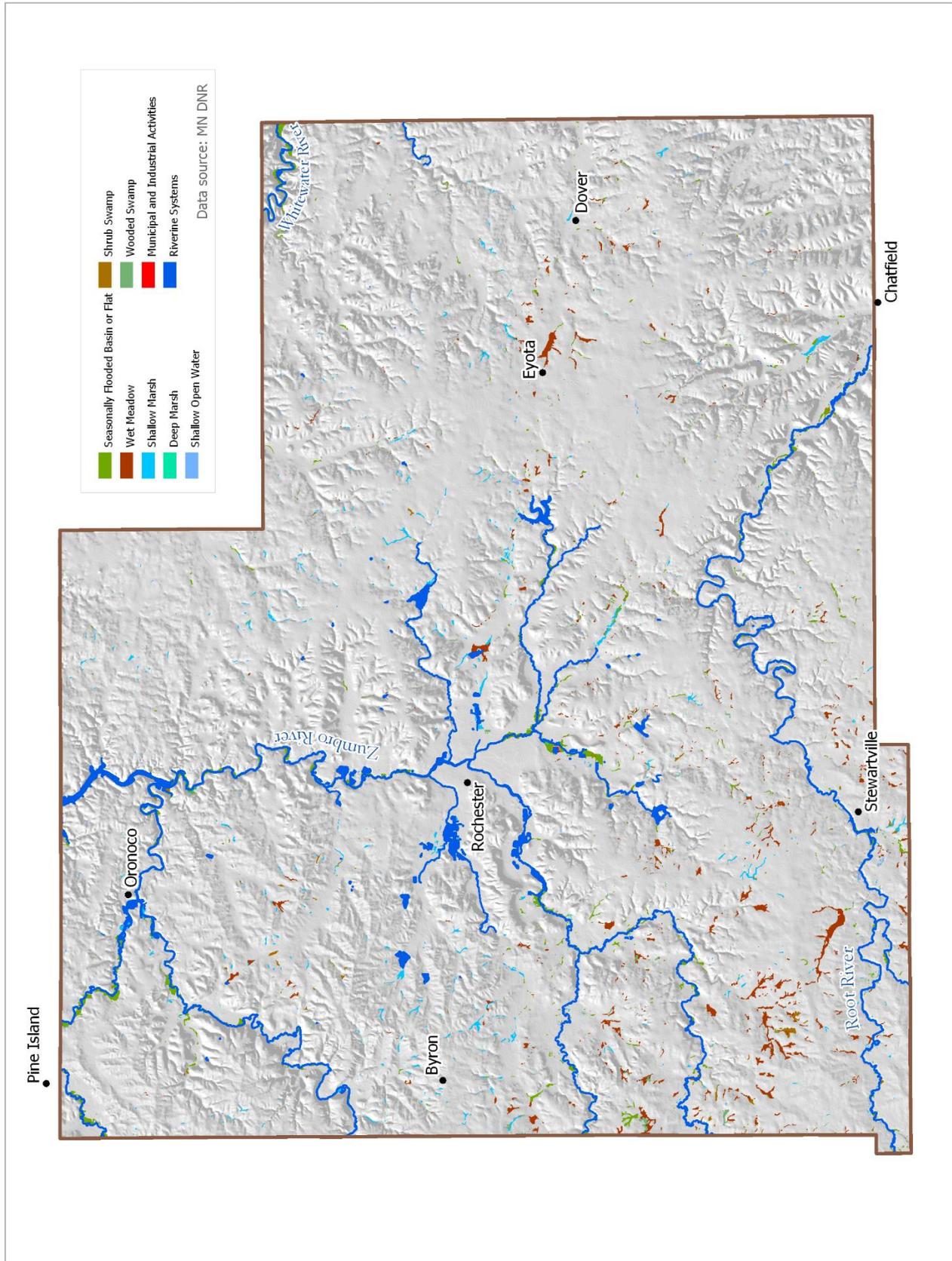


Figure A - 2. Olmsted County Population by Census Block, 2010

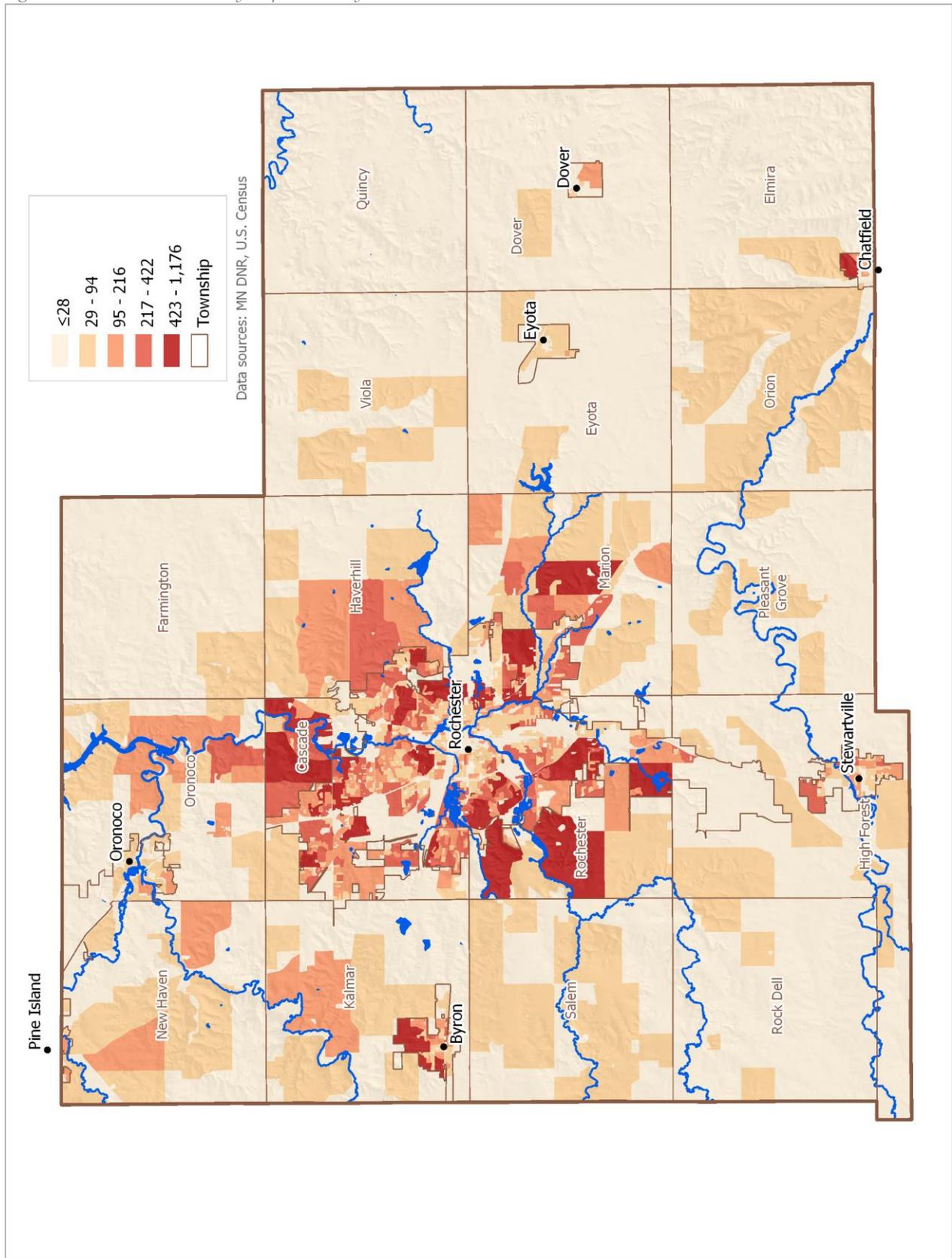


Figure A - 3. Fire Departments and Fire Response Times in Olmsted County

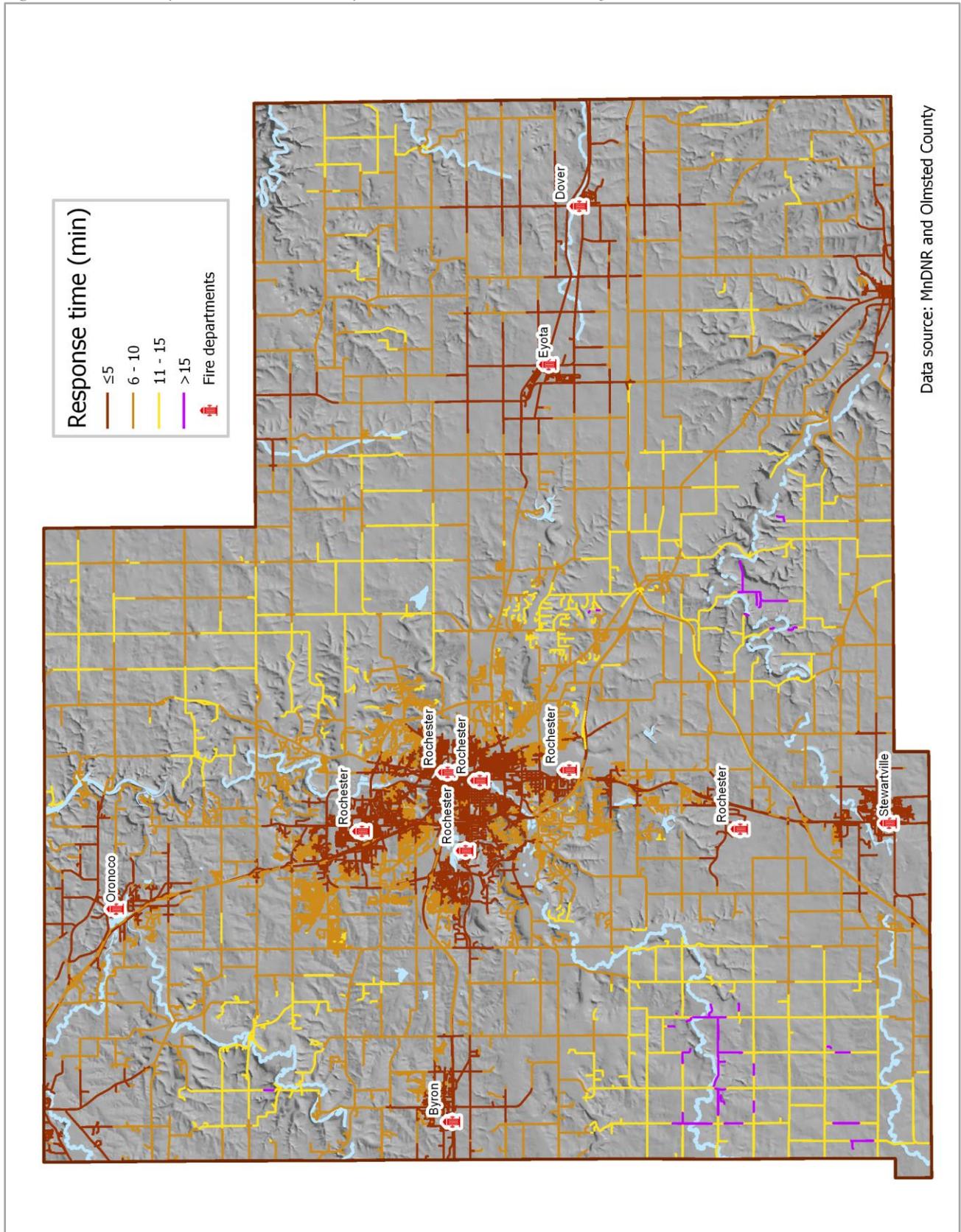


Figure A - 4. Olmsted County Public Safety and Government Services

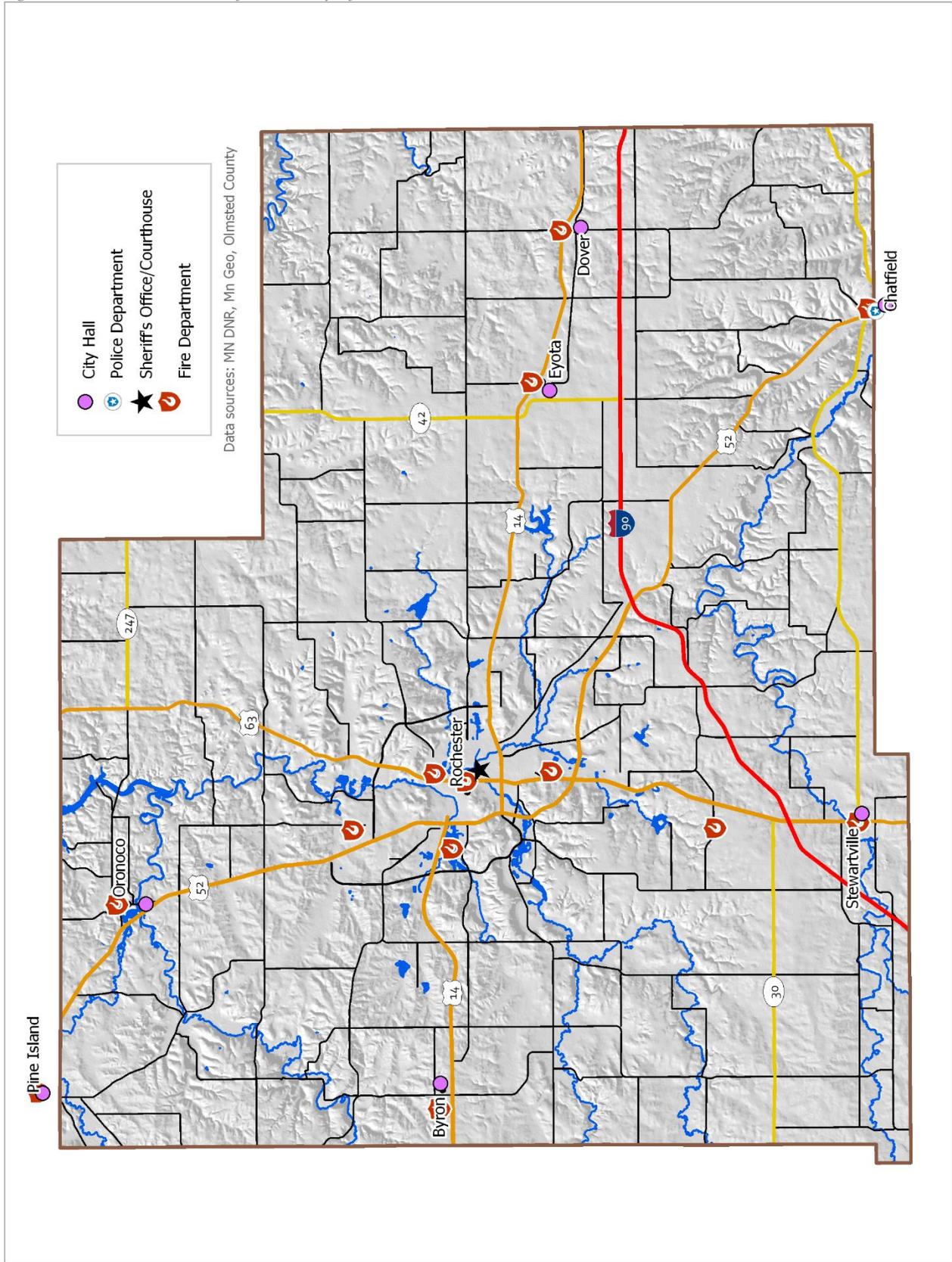


Figure A - 5. Olmsted County Utilities and Communication Infrastructure

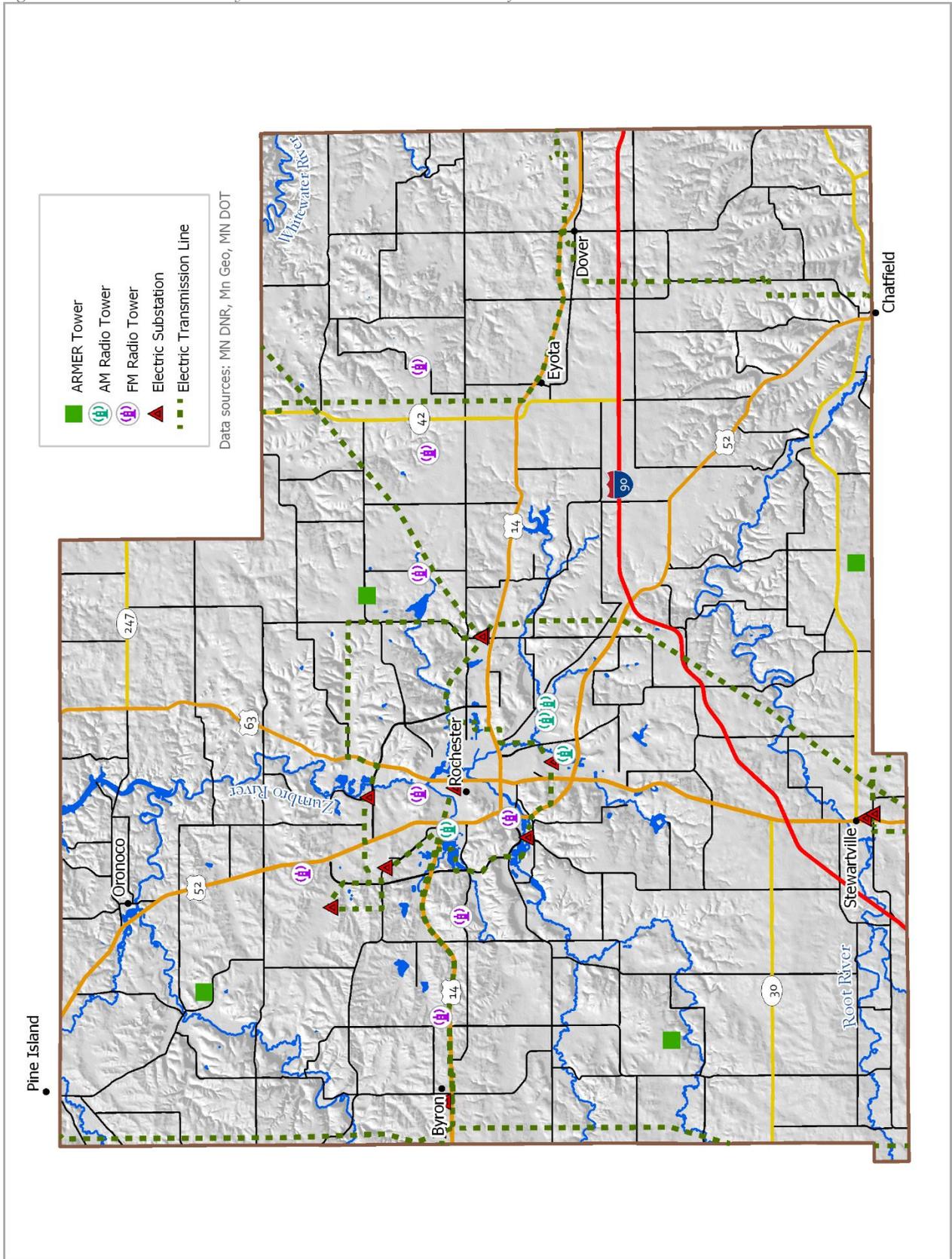


Figure A - 6. Olmsted County Transportation Infrastructure

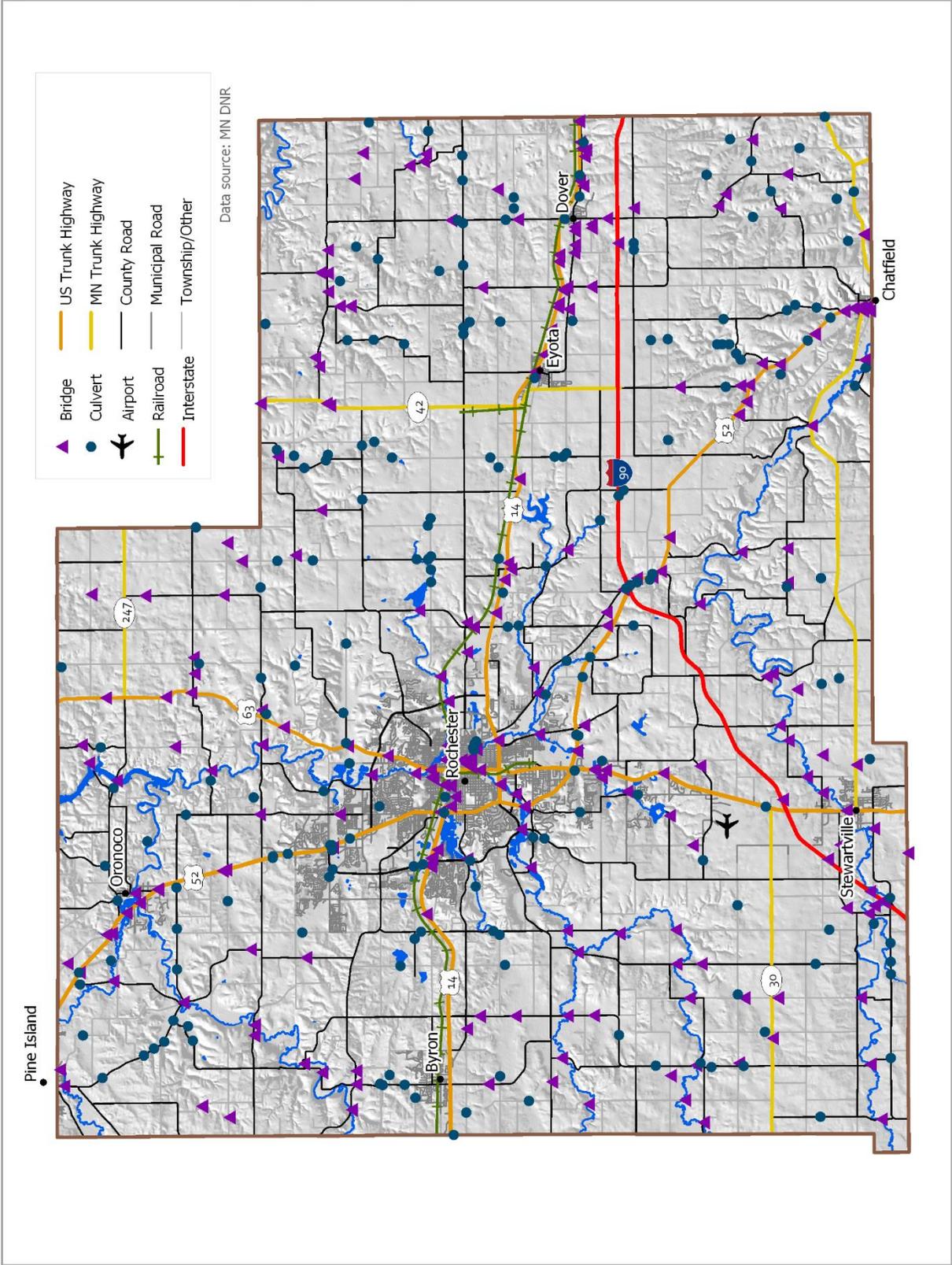


Figure A - 7. Olmsted County Land Cover, National Land Cover Database, 2011

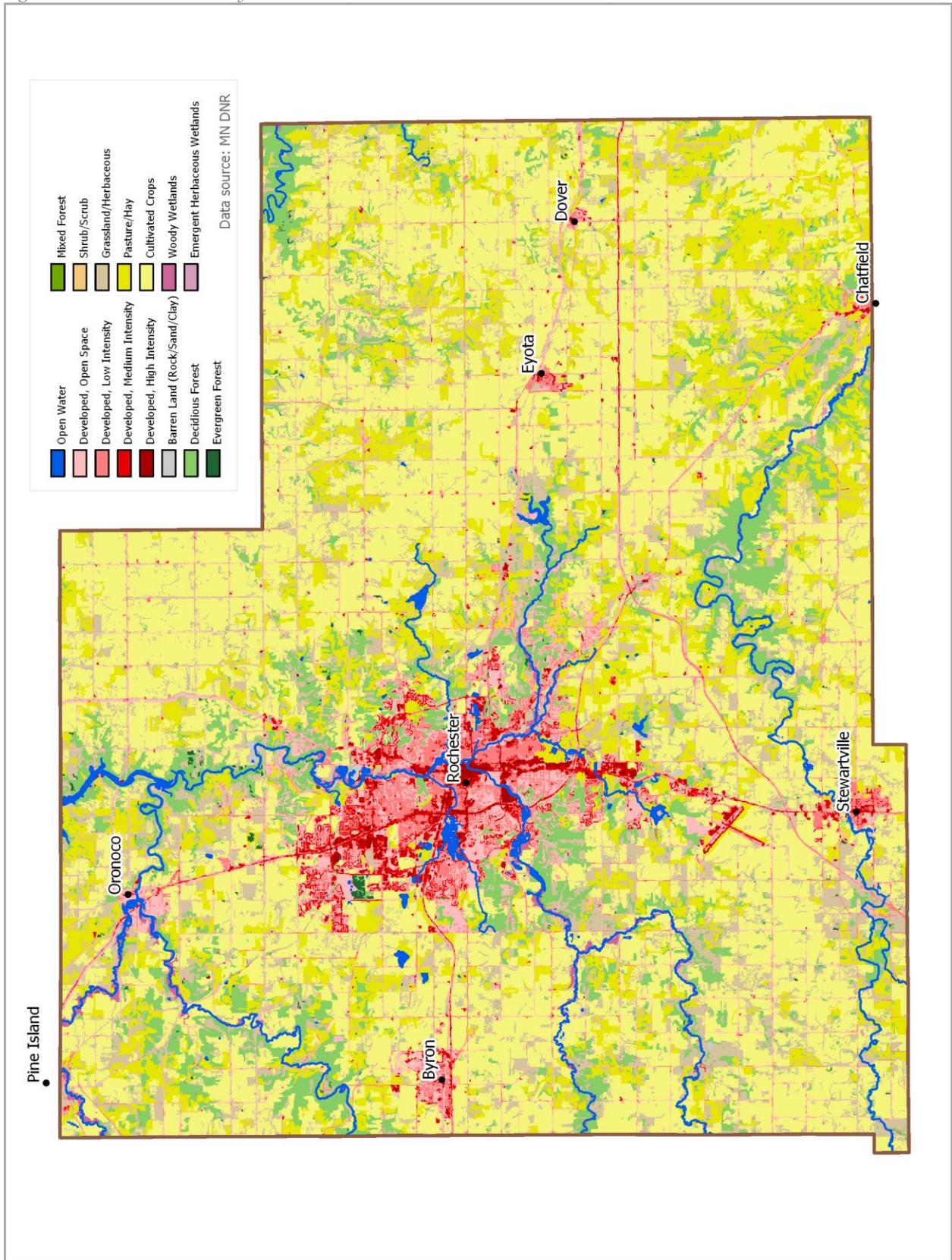


Figure A - 8. Olmsted County Land Ownership by Agency

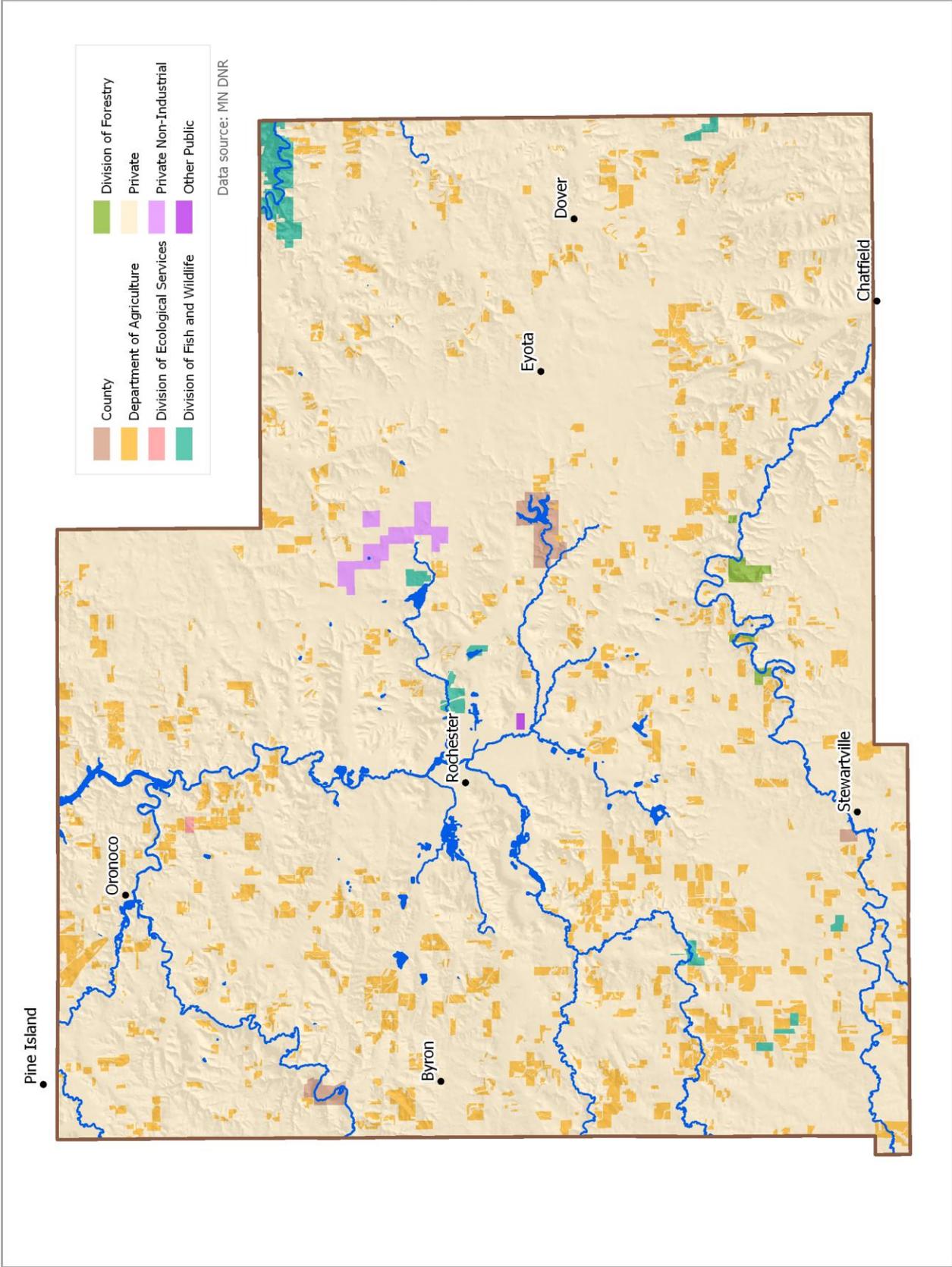




Figure A - 10. Tornado Touchdowns and Paths in Olmsted County

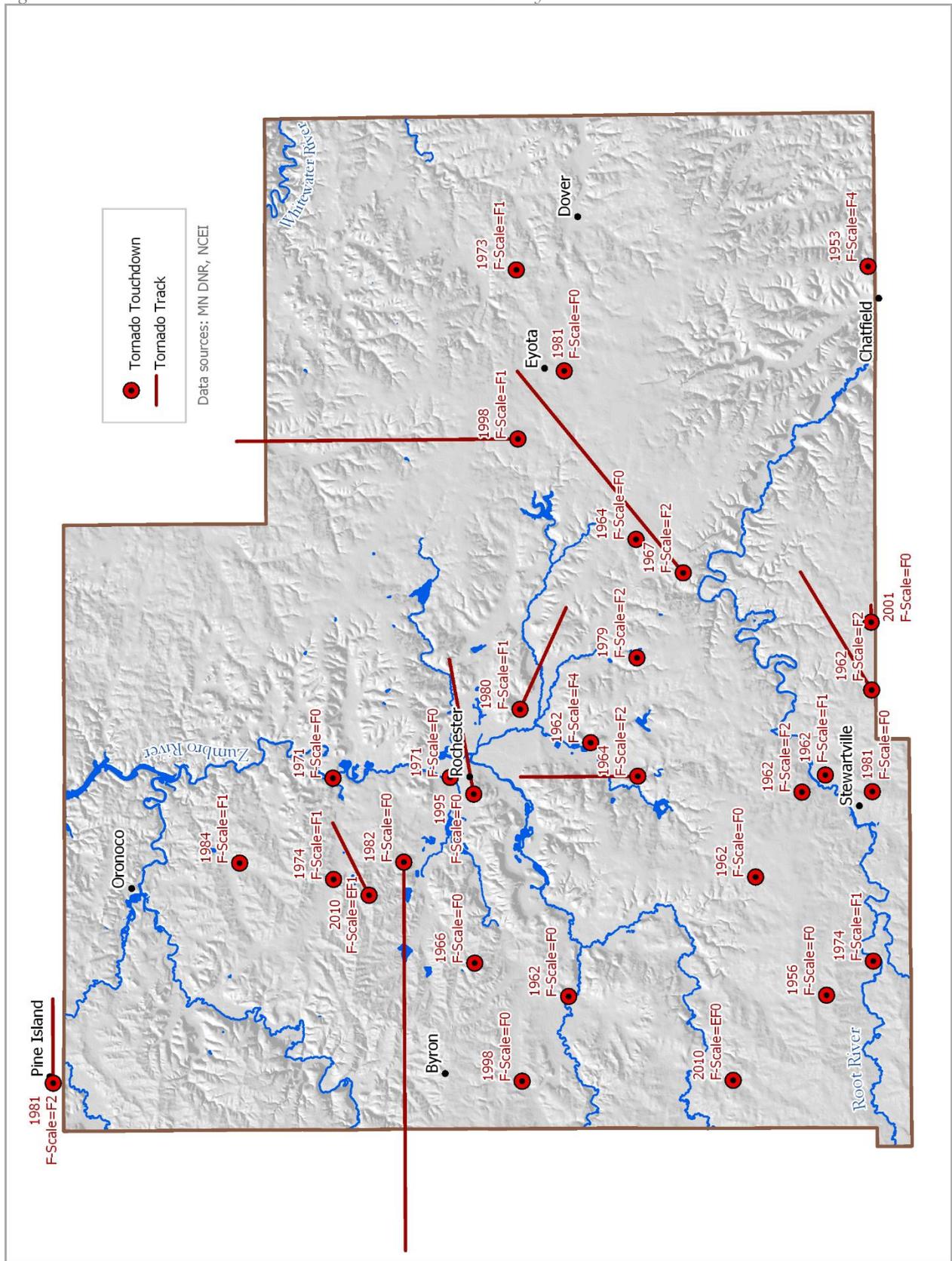


Figure A - 11. Dams in Olmsted County

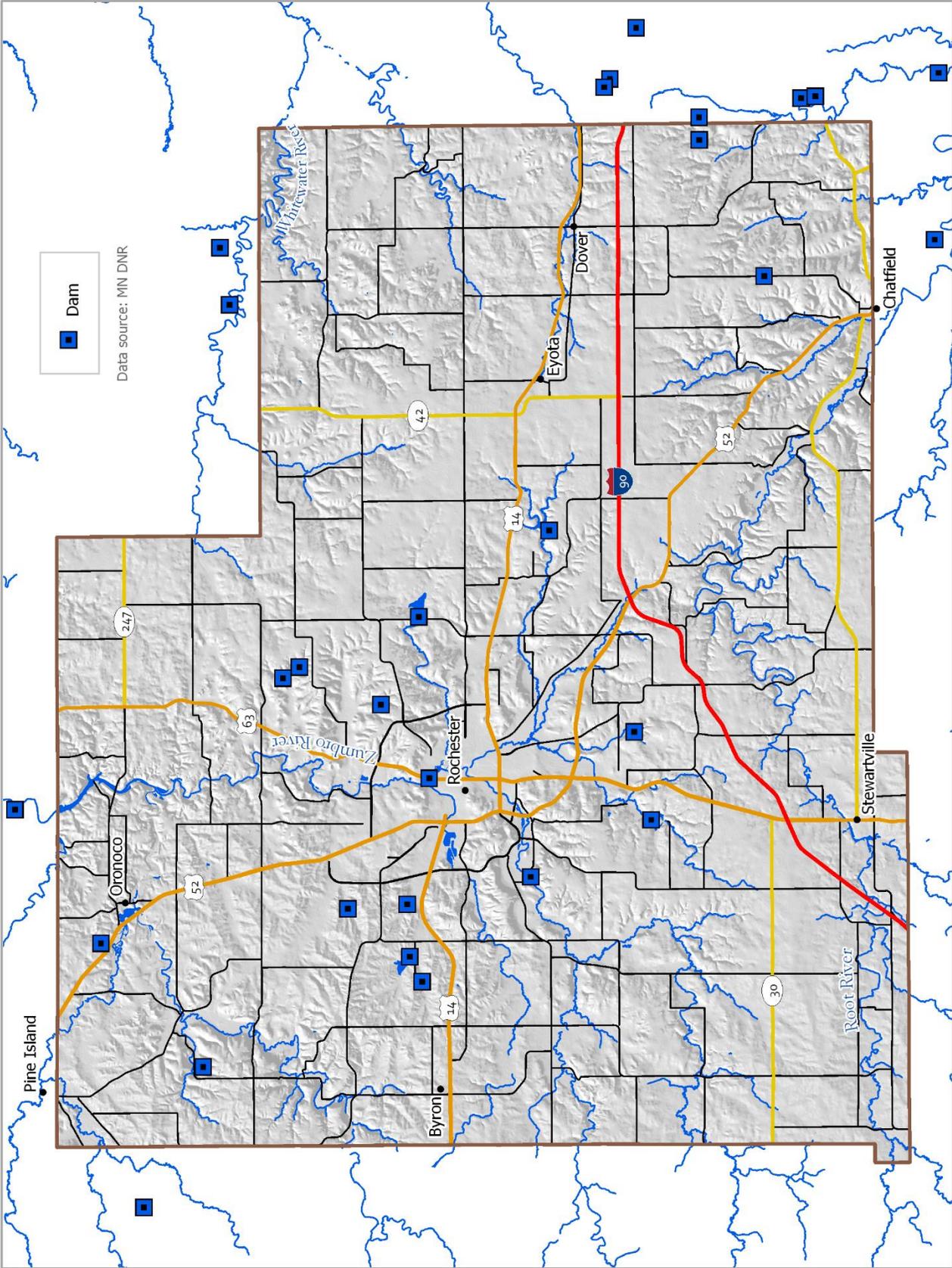


Figure A - 12. Sites with Hazardous or Chemical Waste in Olmsted County

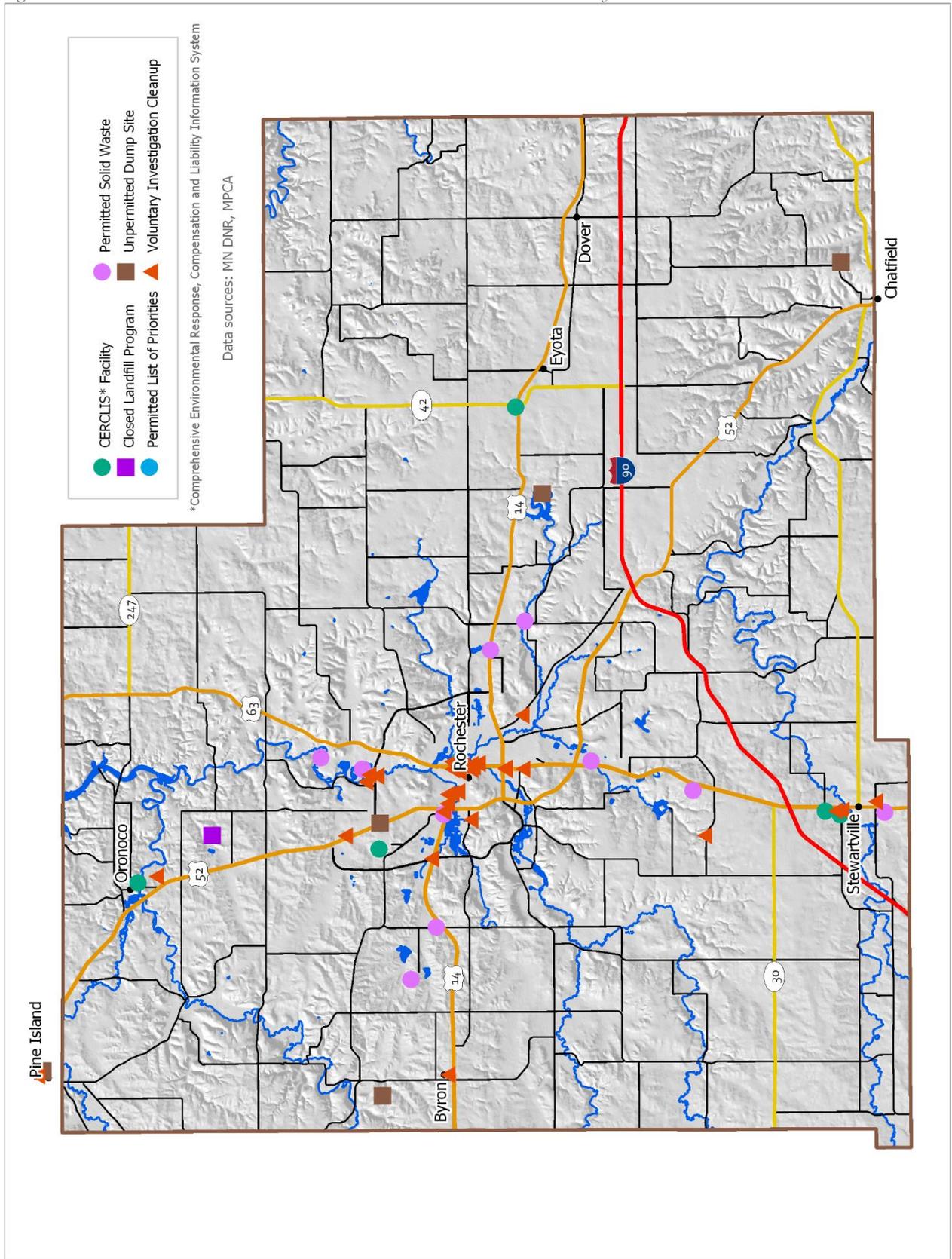


Figure A - 13. Health Care Providers in Olmsted County

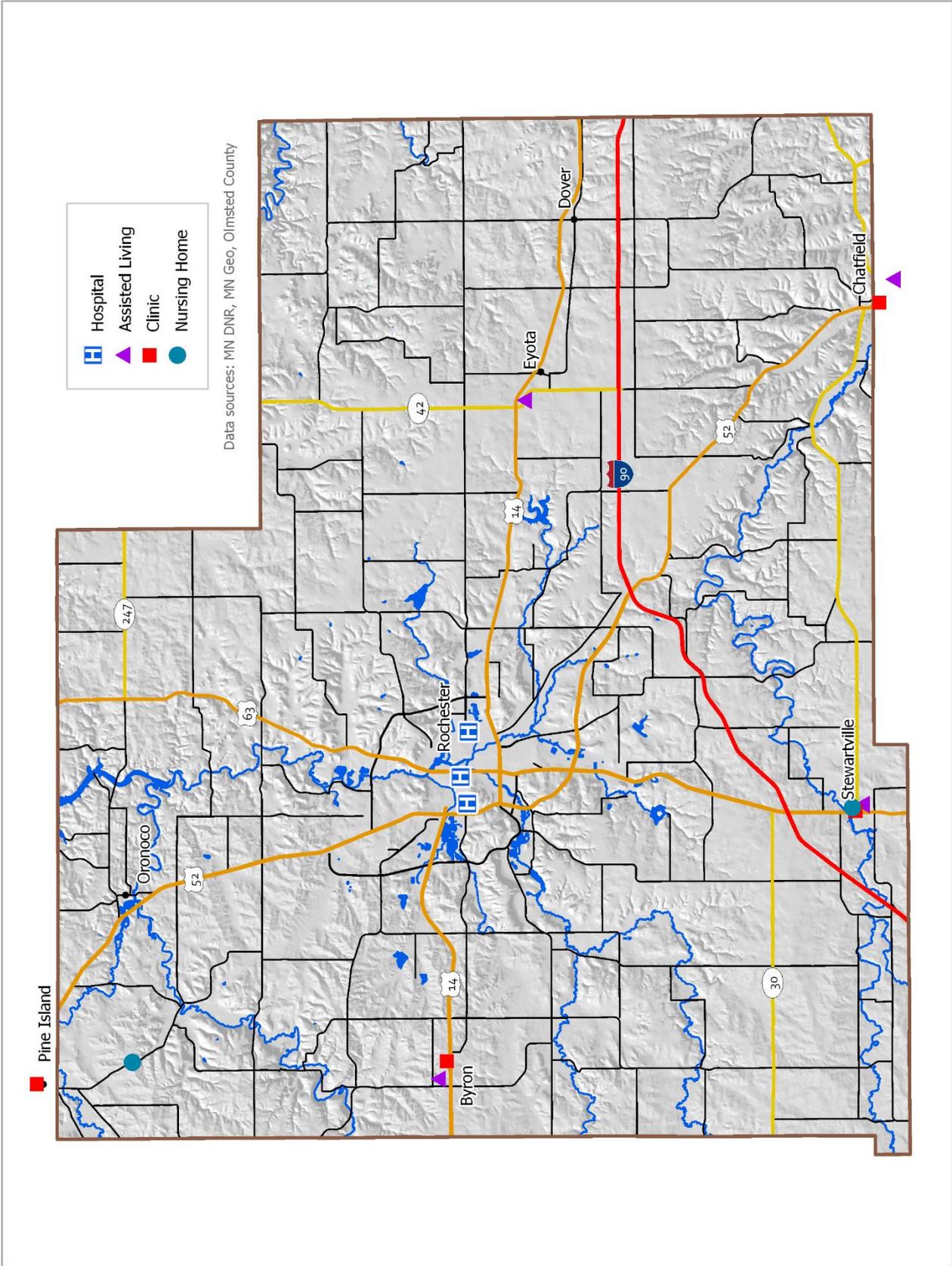


Figure A - 14. Olmsted County Aquifer Vulnerability and Public/Municipal Wells

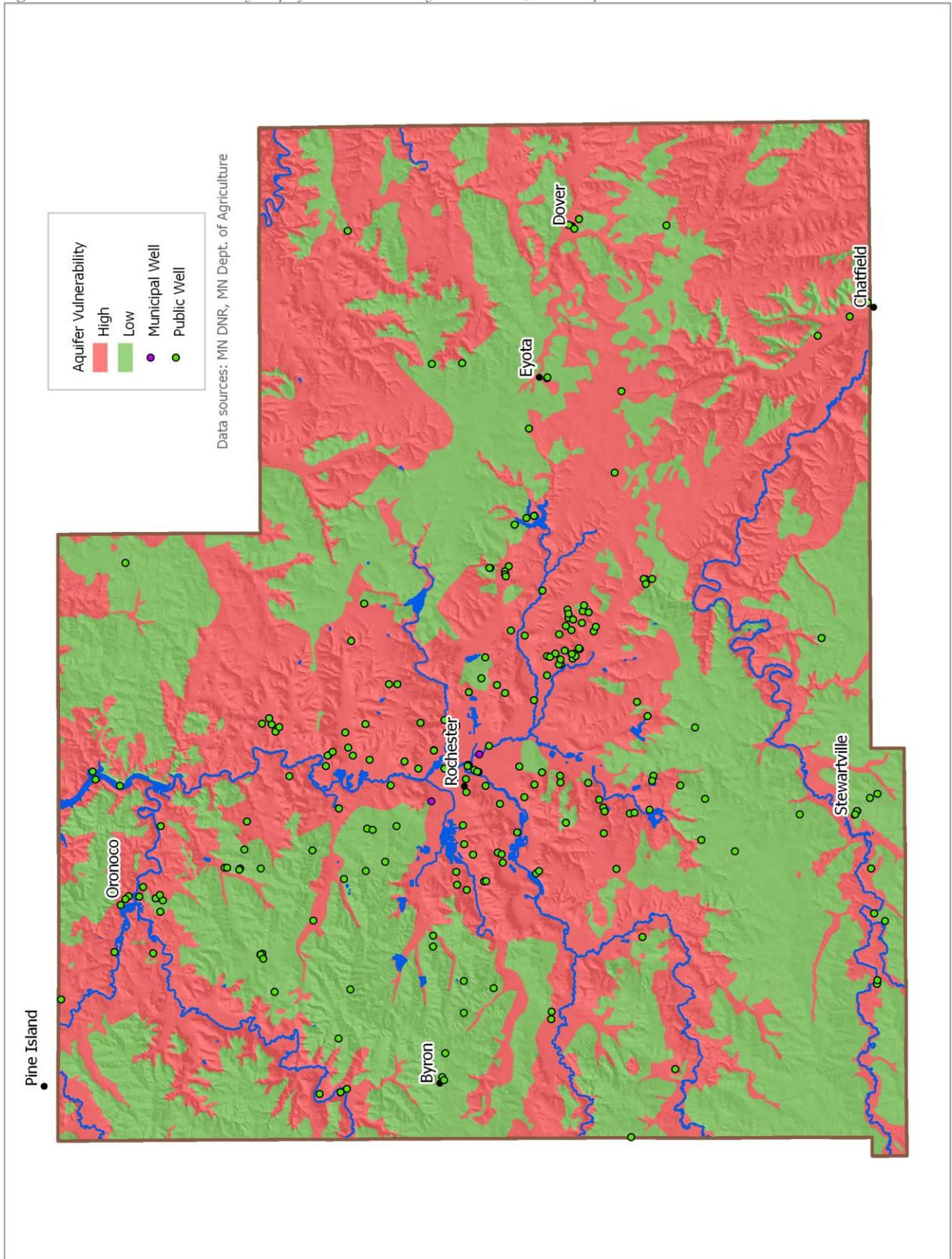


Figure A - 15. Critical Facilities in Olmsted County

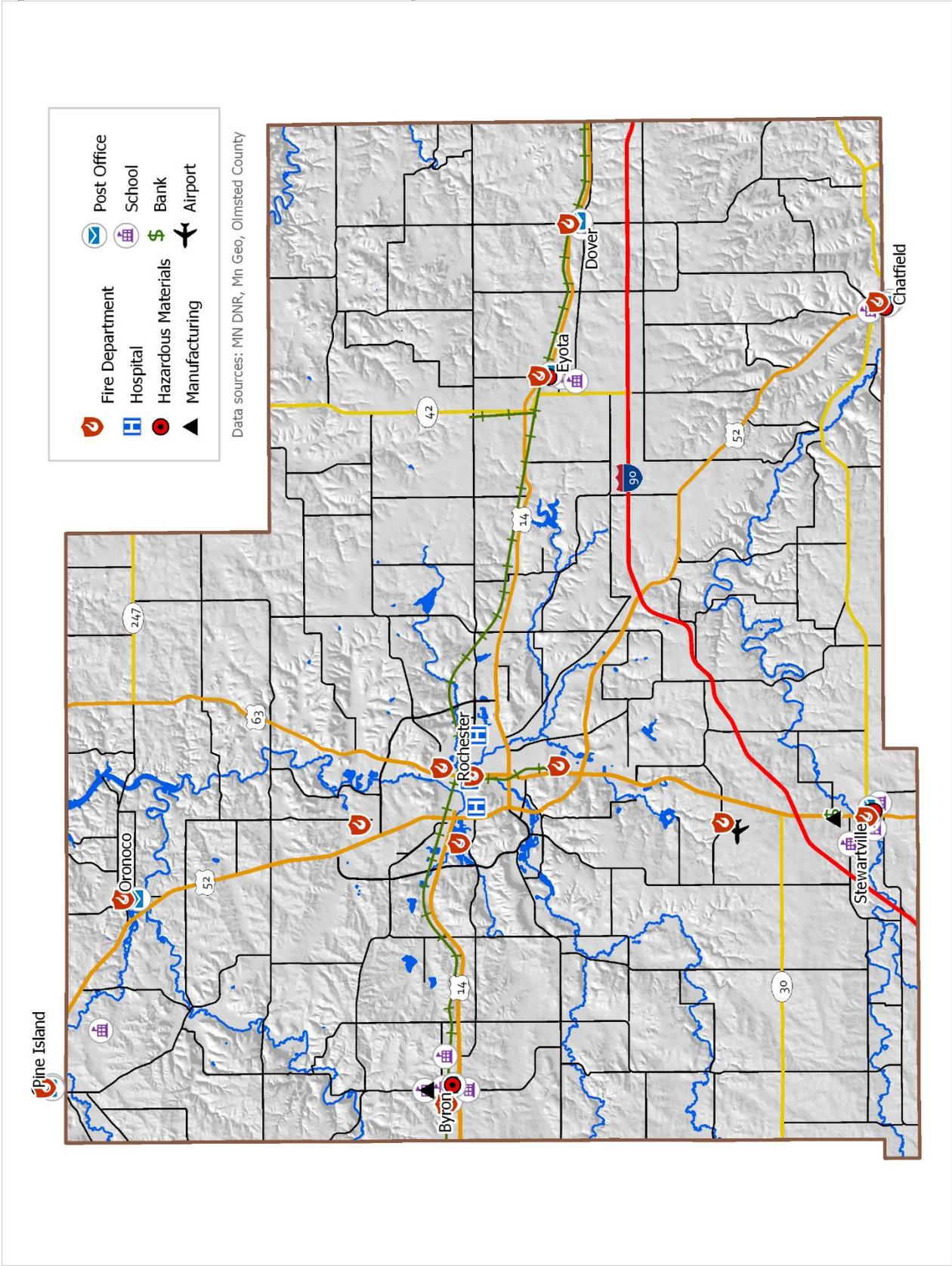


Figure A - 16. Critical Facilities in Stewartville

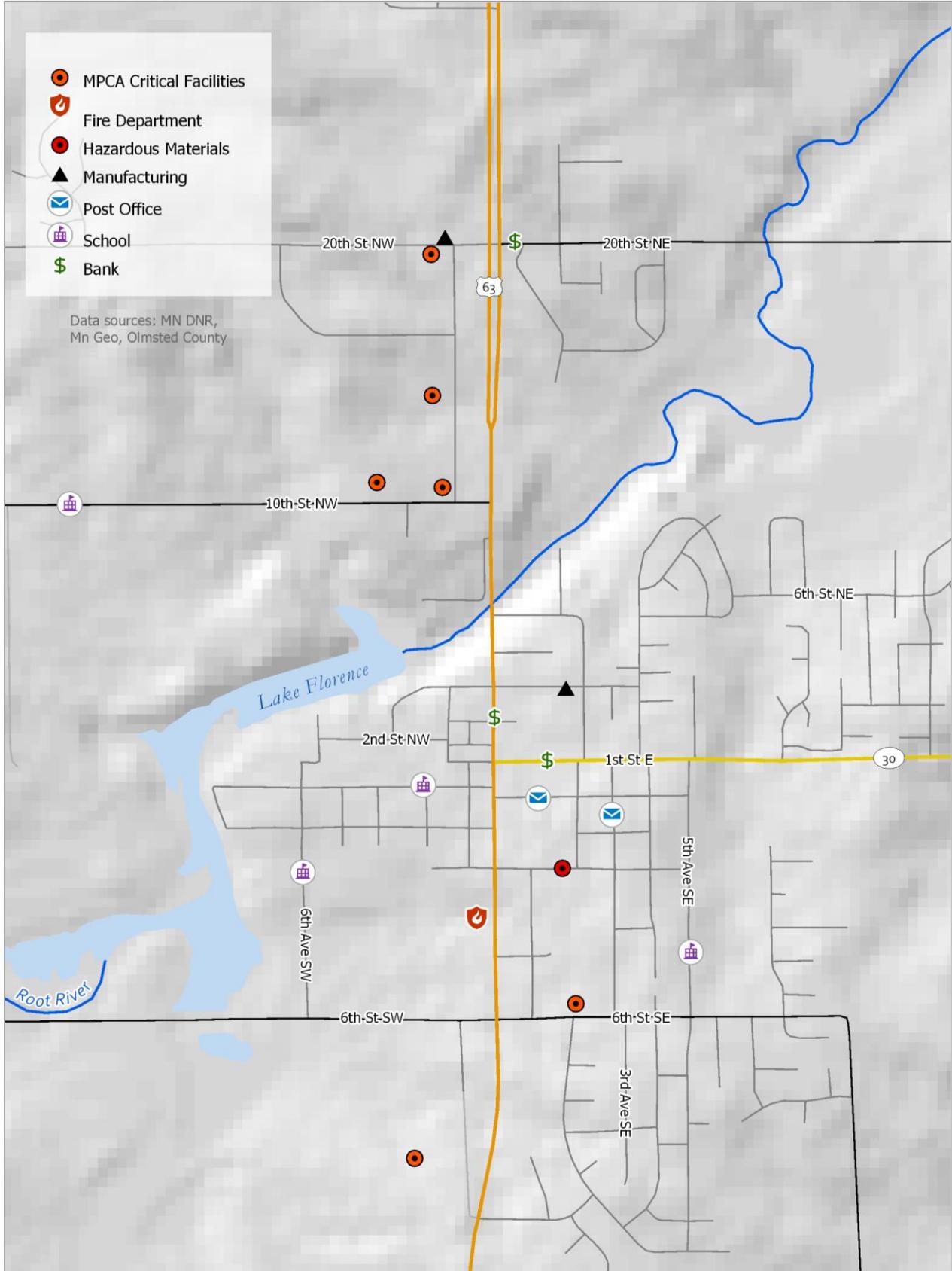


Figure A - 17. Critical Facilities in Byron

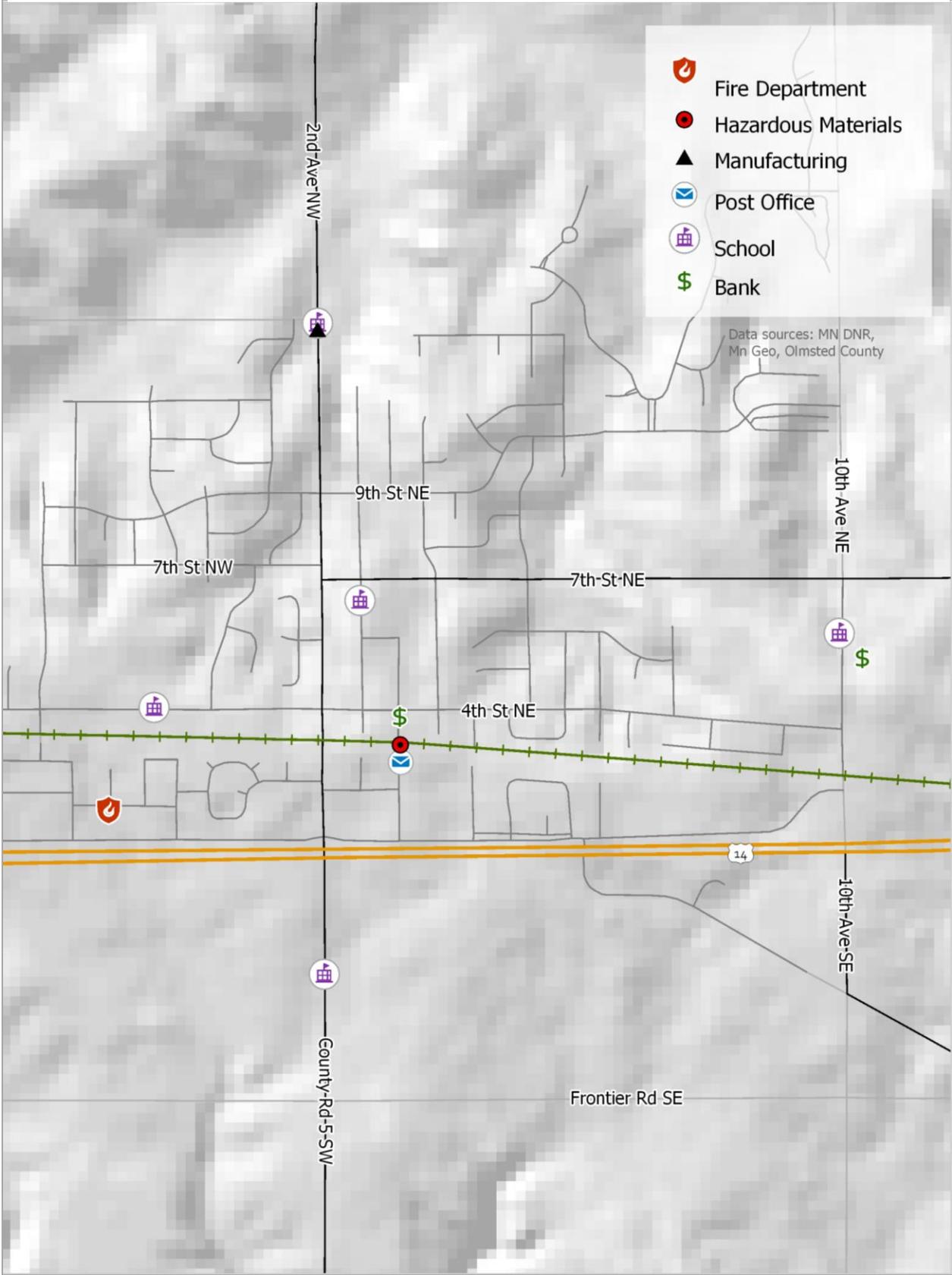


Figure A - 18. Wildfires by Acres Burned (1985-April 2015) in Olmsted County

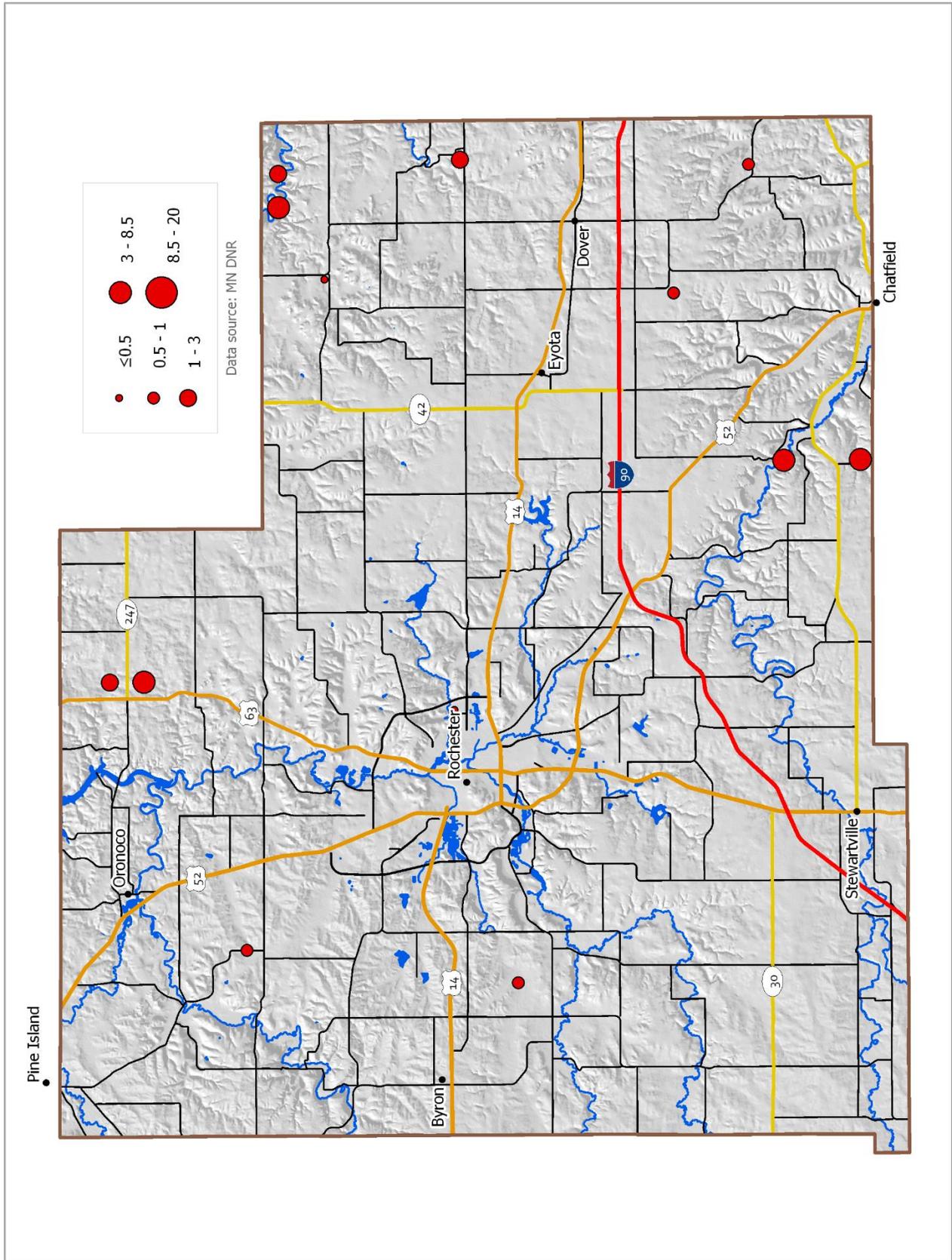


Figure A - 19. Distribution of Estimated Economic Loss for Olmsted County in 100-Year Flood

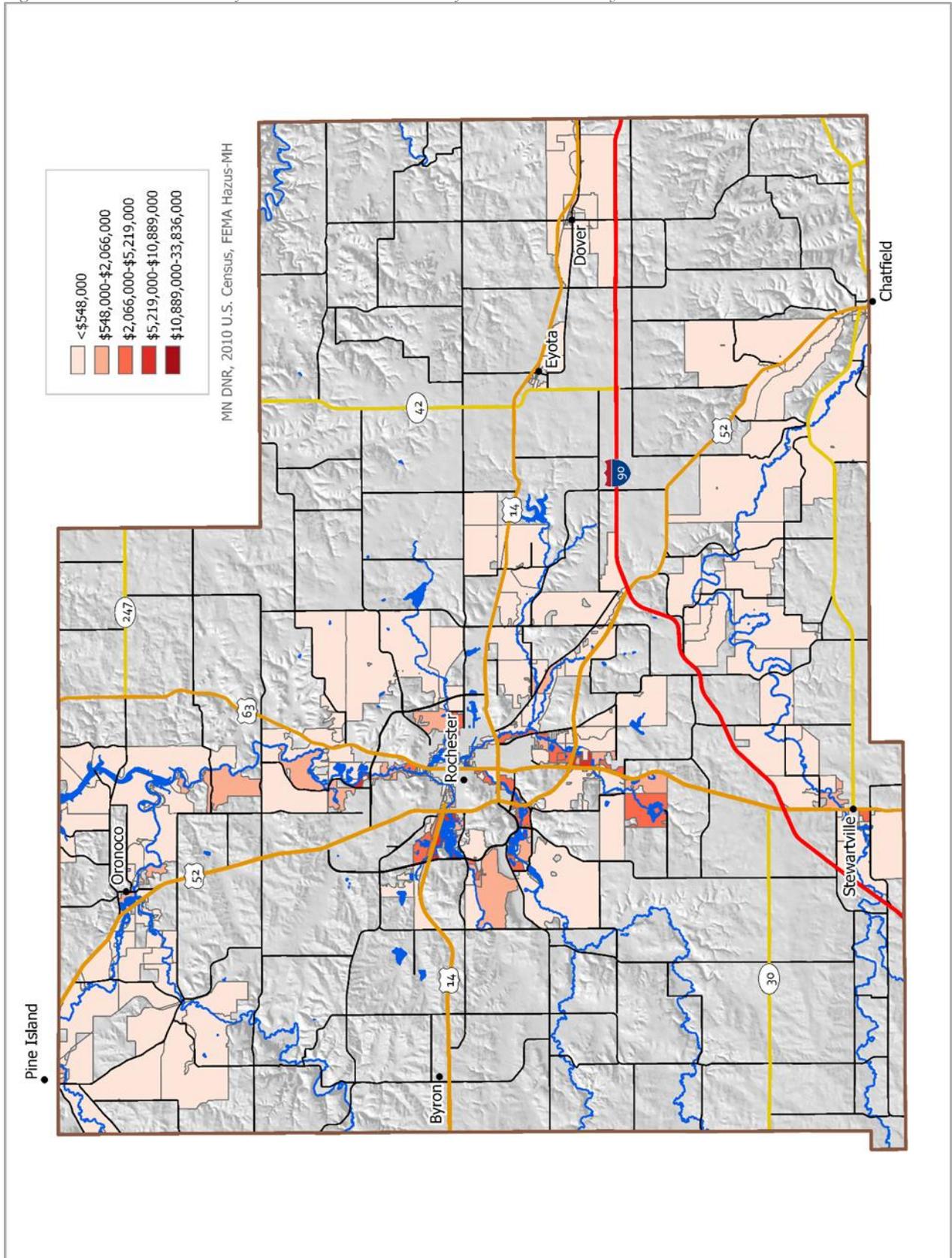


Figure A - 20. Census Block #271090021004036 and 100-Year Floodplain in Stewartville



Figure A - 21. Census Block #271090019002022 and 100-Year Floodplain in Pine Island

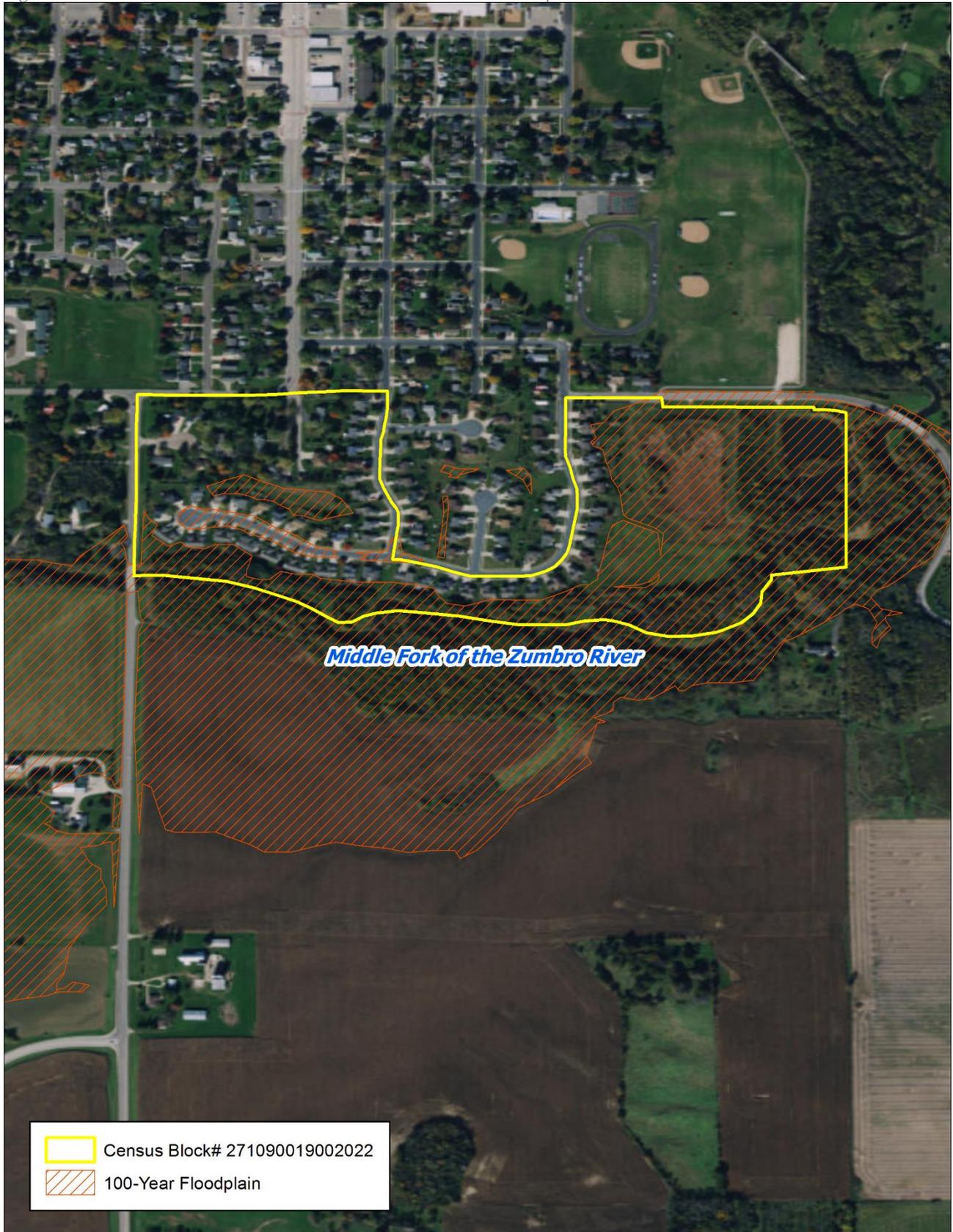


Figure A - 22. Census Block #271090017032003 and 100-Year Floodplain in Oronoco

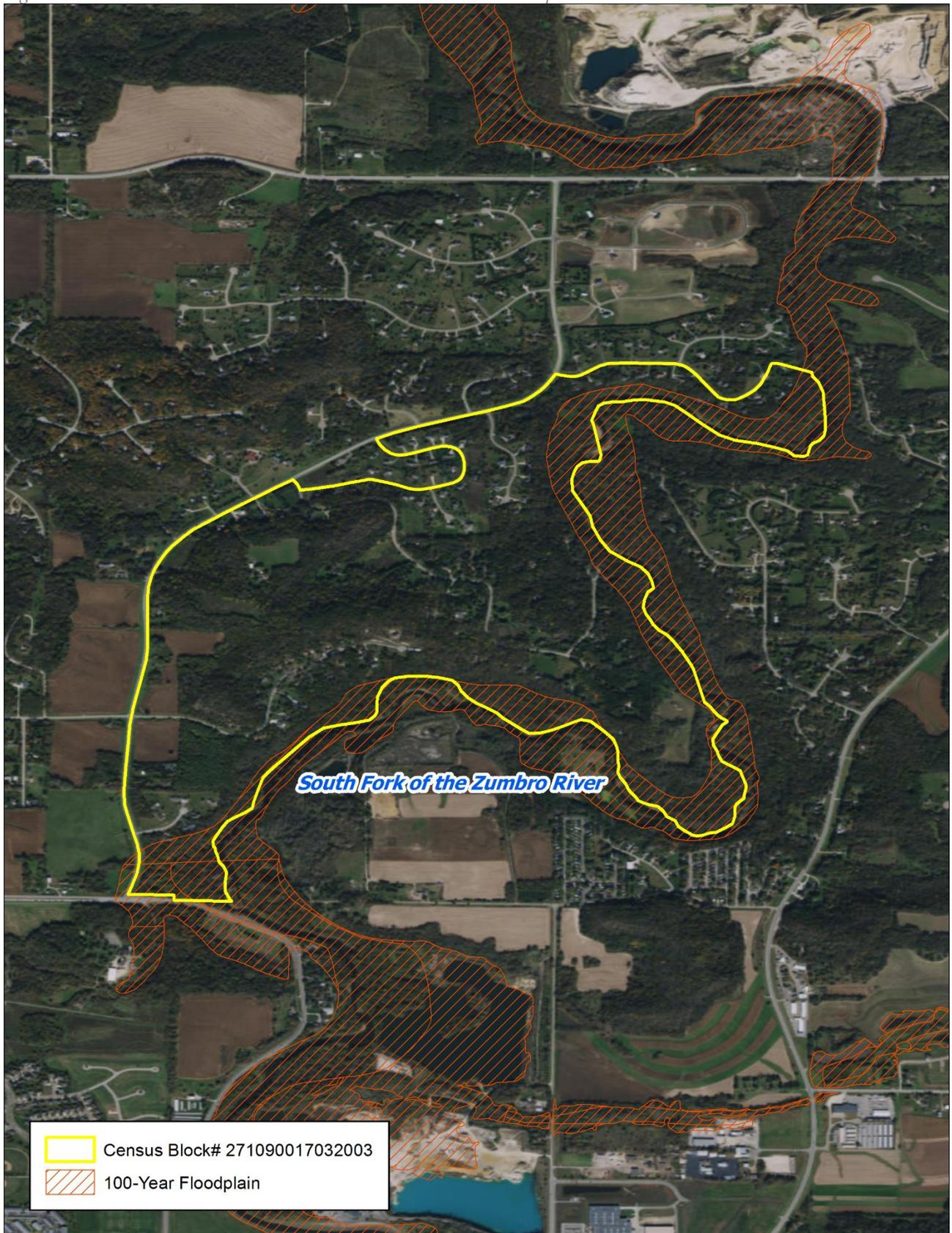


Figure A - 23. Census Block #271090021003010 and 100-Year Floodplain in Stewartville

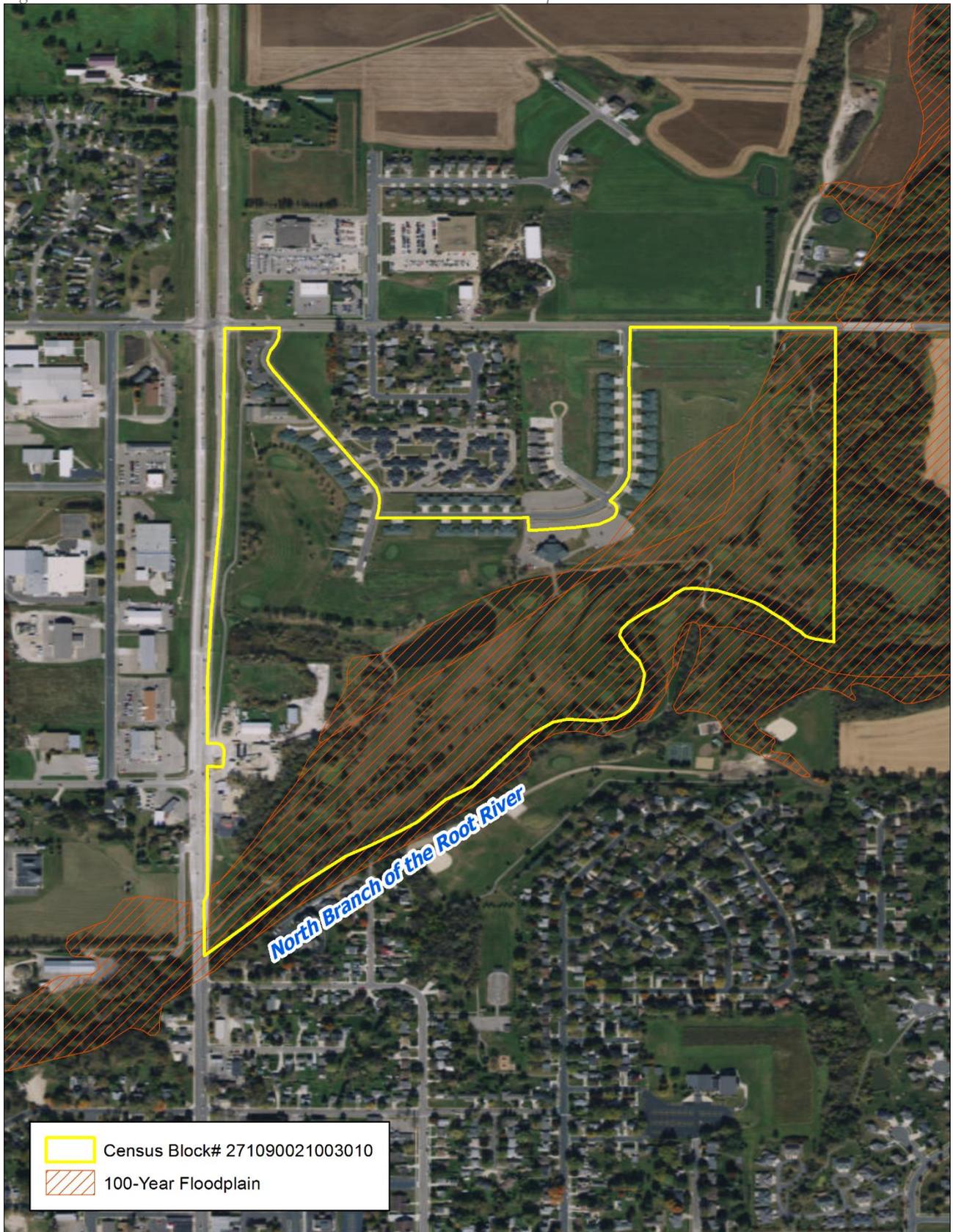


Figure A - 24. Census Block #271090019001059 and 100-Year Floodplain in Oronoco

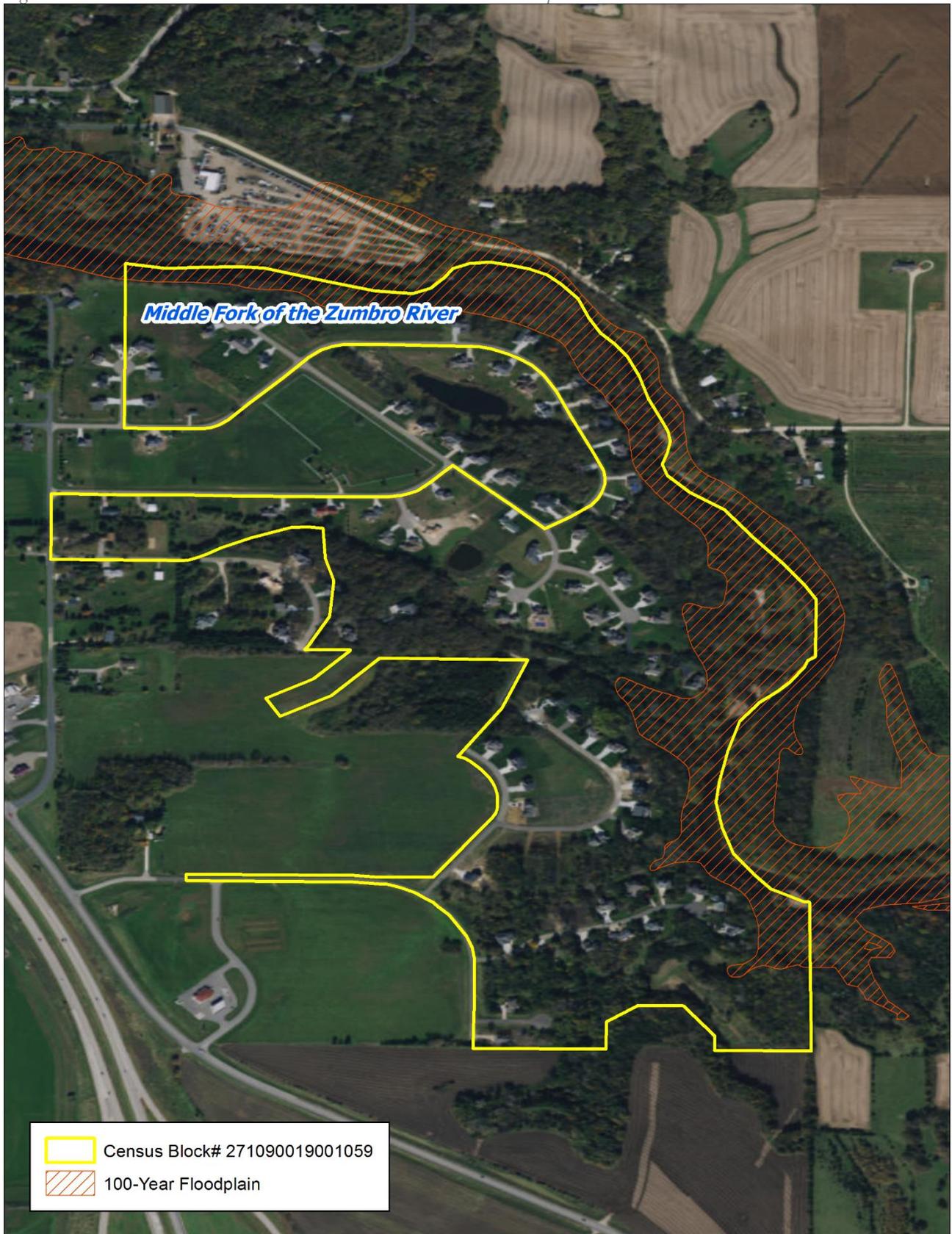


Figure A - 25. Olmsted County Essential Facilities in 100-Year Floodplain

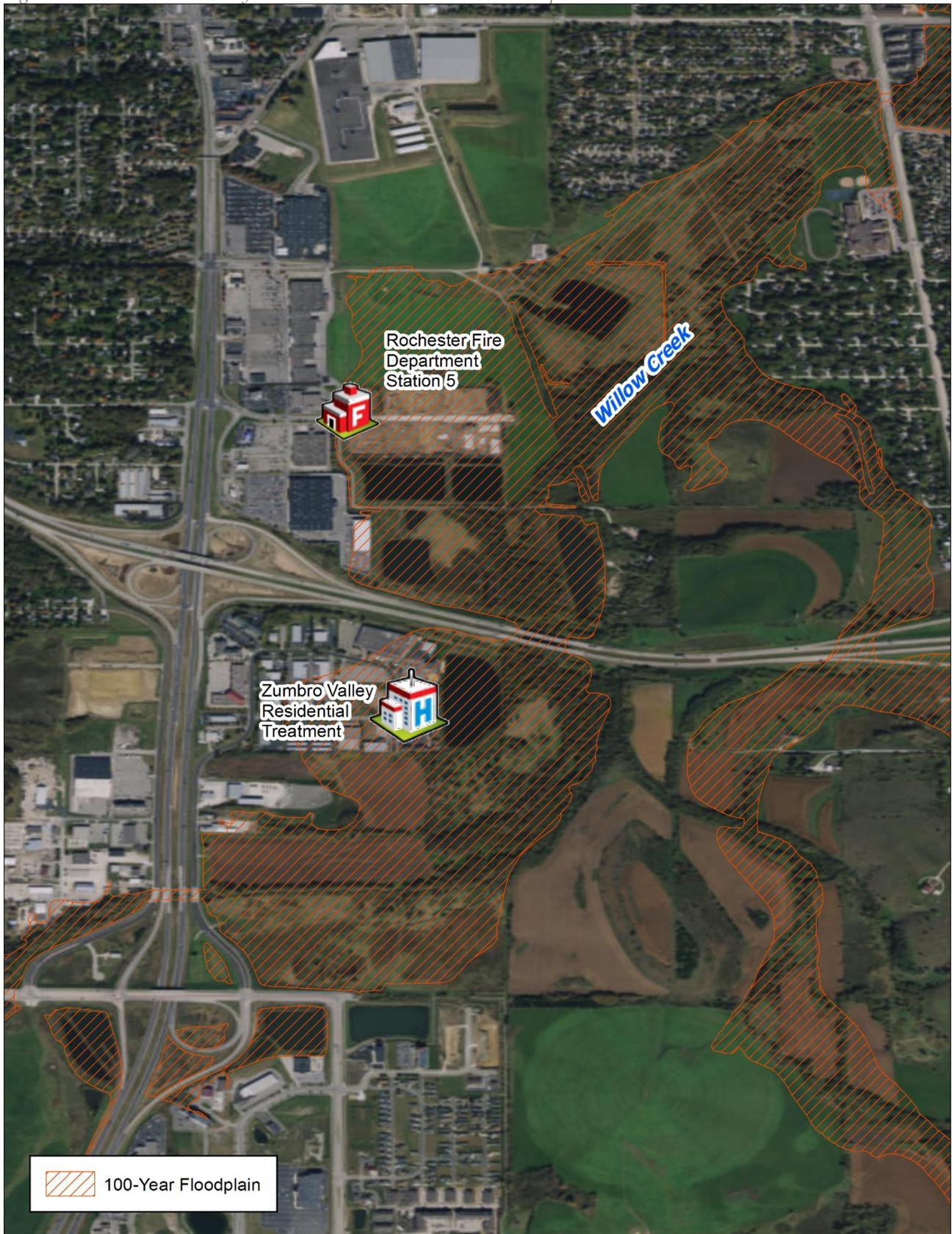


Figure A - 26. Feedlots in Olmsted County

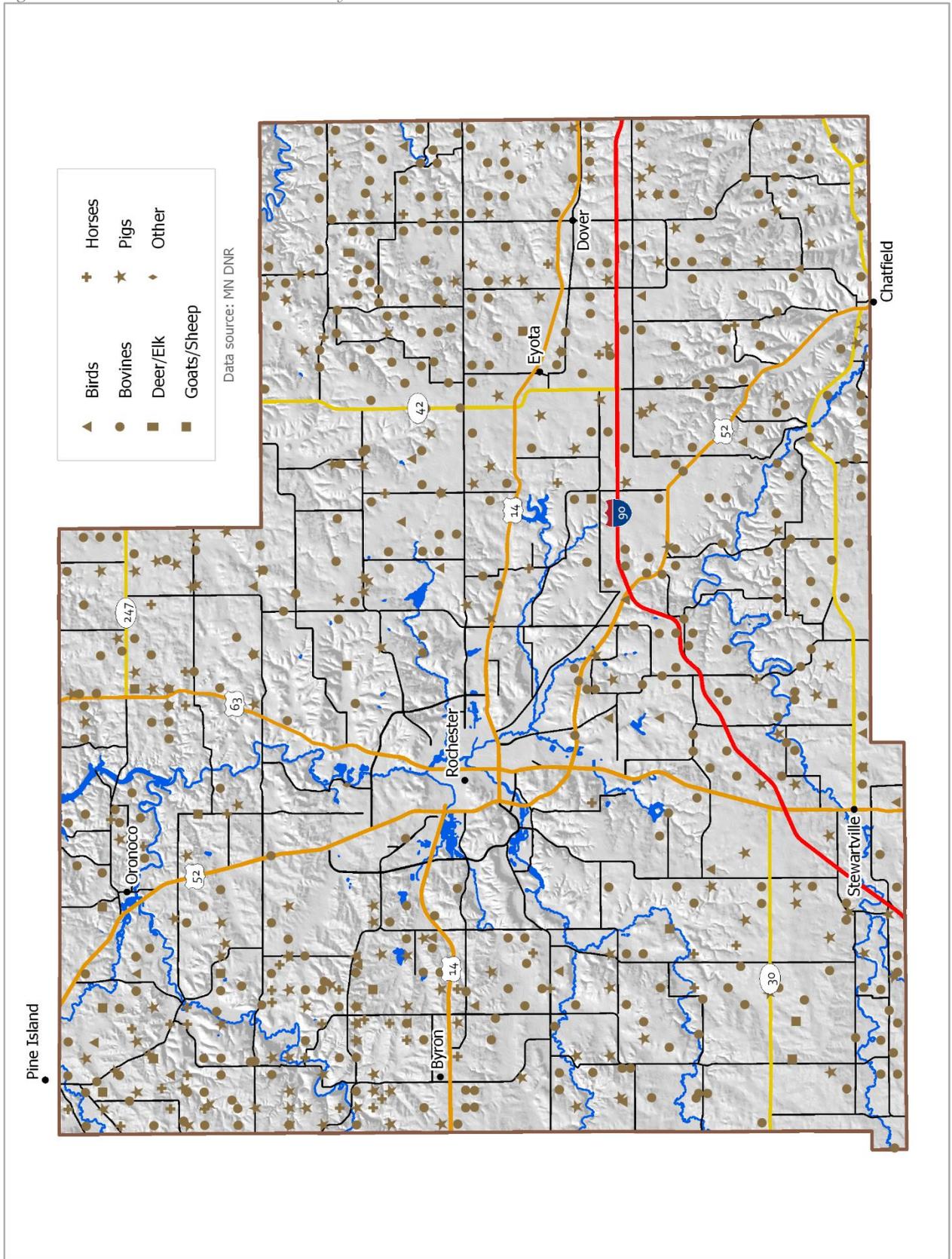


Figure A - 27. Soil Erodibility (K Factor) as Percentage in Olmsted County

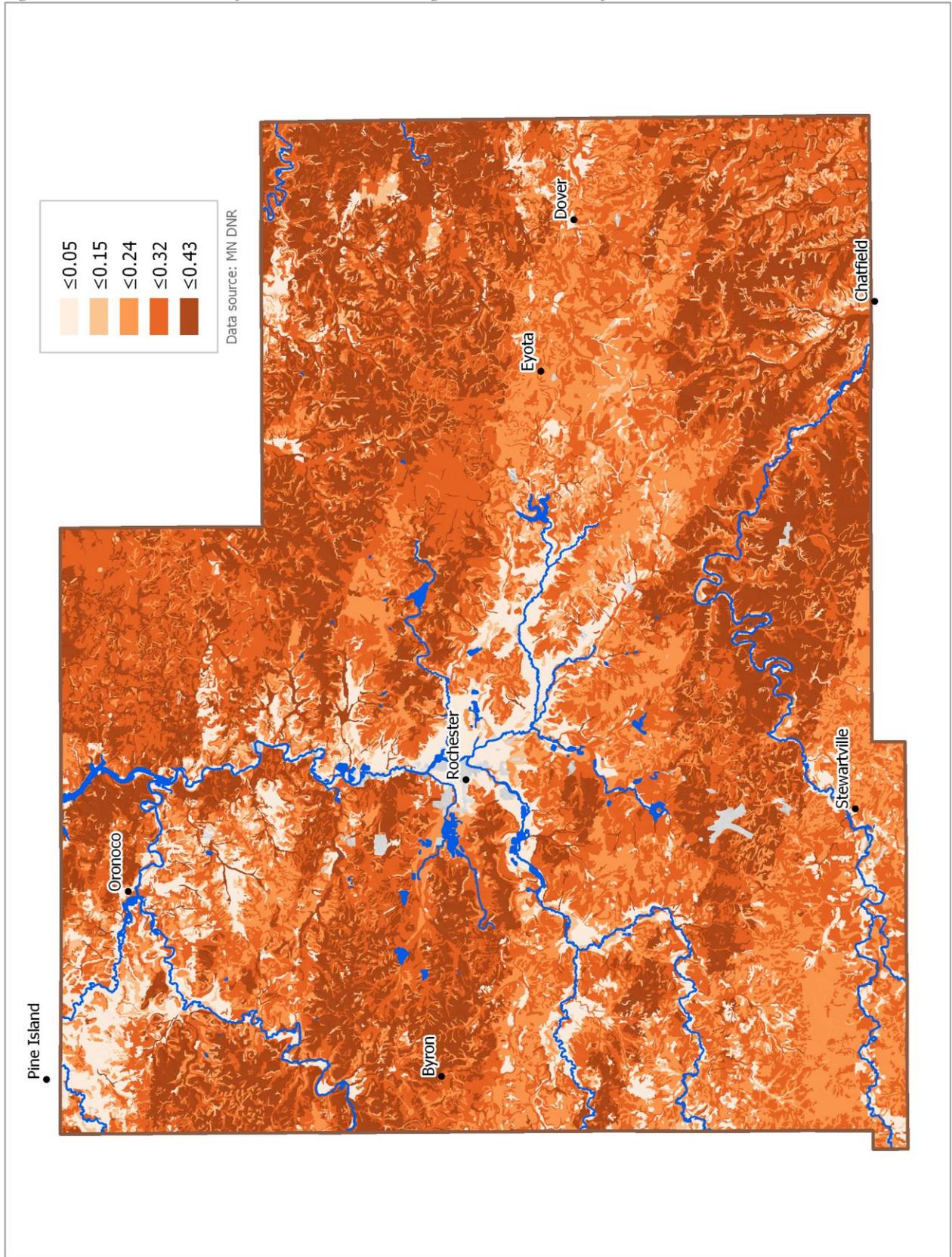


Figure A - 28. Karst Features in Olmsted County

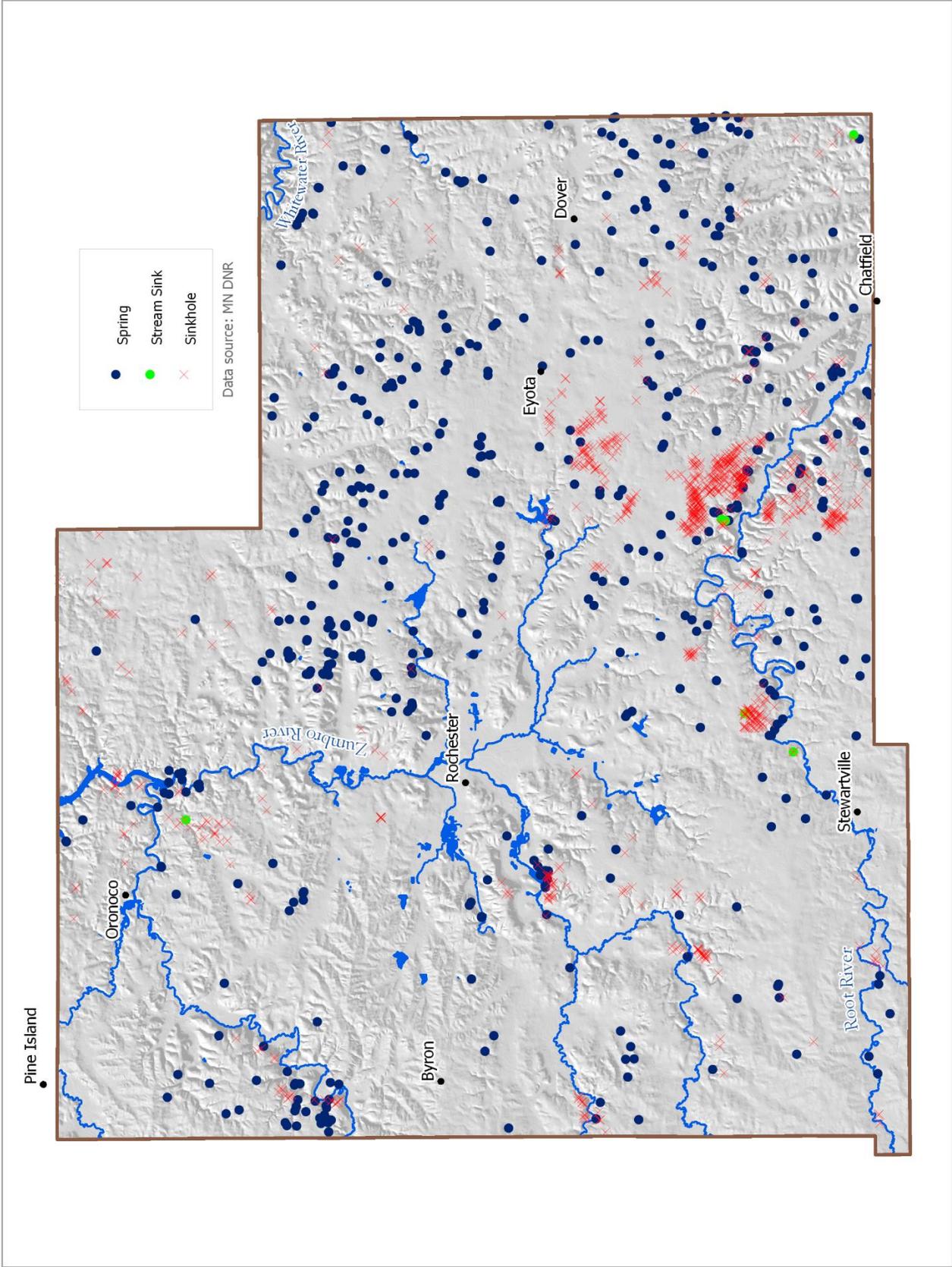
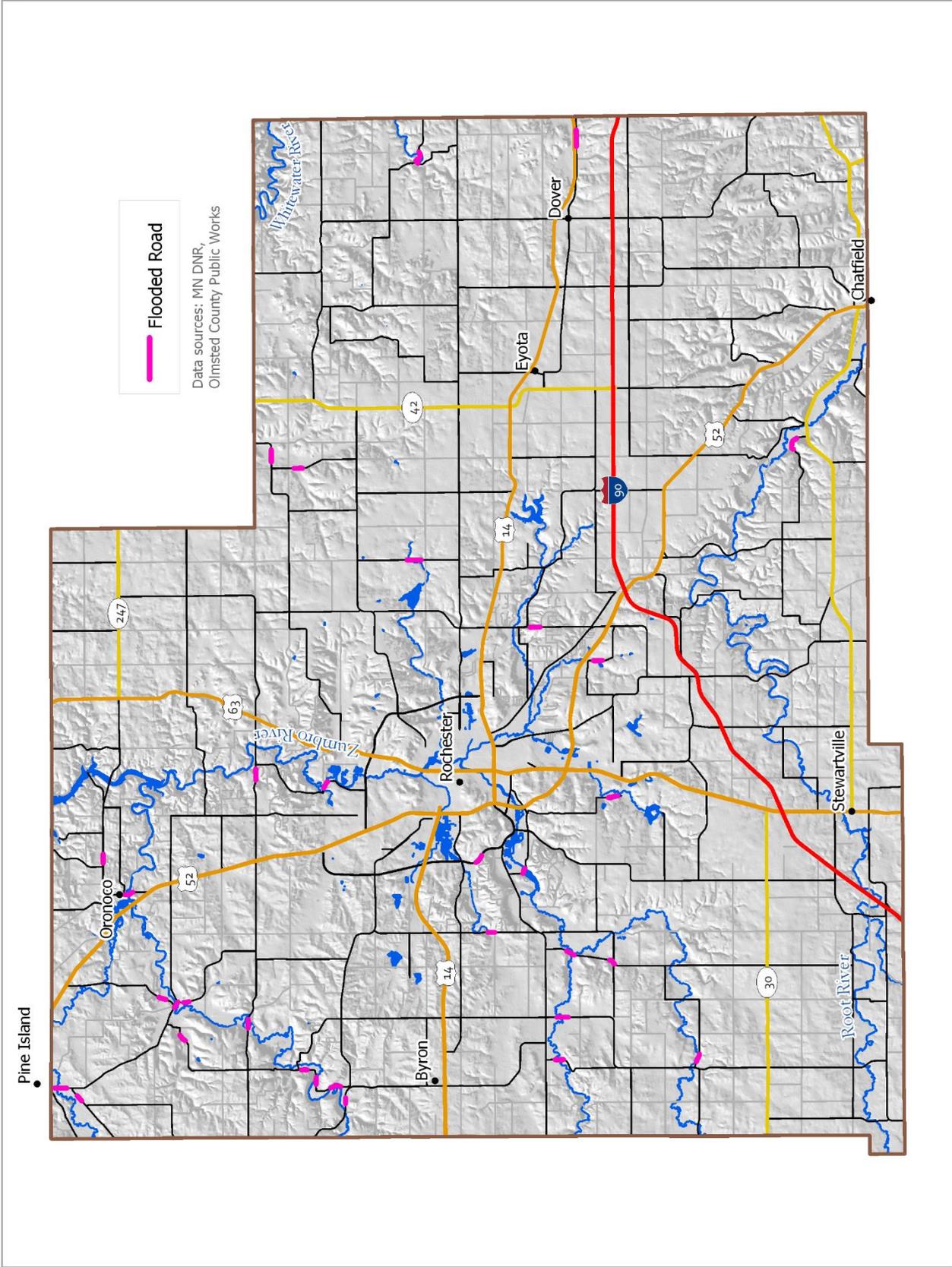


Figure A - 29. Flooded Roads in the 2007 and/or 2010 Floods



# Appendix B

## Olmsted County Critical Facilities

Agriculture & Food				
JennieO Turkey Store	300 County Rd 3 SW	Byron	MN	55920
Donley Farm Inc	4542 110 Ave SW	Byron	MN	55920
Shea Dairy Inc	10240 Viola Rd NE	Eyota	MN	55934
Change Taxonomy Hogs/Cows	2910 White Bridge Rd NW	Oronoco	MN	55960
Manco of FMT, Inc	7525 Hwy 30 SW	Stewartville	MN	55976
JennieO Turkey Store, Orion	10351 84 <sup>th</sup> St SW	Chatfield	MN	55923
Hoffman Farms	9500 Hwy 30 SW	Chatfield	MN	55923
Hinkley Holsteins	19320 Hwy 74 SE	Chatfield	MN	55923
Gar-Lin	4421 130 <sup>th</sup> Ave SE	Eyota	MN	55934
Schoenfelder Farms	11271 55 <sup>th</sup> St SE	Eyota	MN	55934
Blue Horizon Farm 1	4329 75 <sup>th</sup> St NE	Rochester	MN	55906
Kevin Ihrke	4215 175 <sup>th</sup> Ave NE	St Charles	MN	55972
Larry Brubaker Farm	15210 15 <sup>th</sup> St SE	Dover	MN	55929
JennieO Turkey Store Dover Farm	14737 County Rd 129 SE	Dover	MN	55929
Schoenfelder Farms	4340 30 <sup>th</sup> Ave SE (Main Farm)	Rochester	MN	55904
JennieO Turkey Store Northern Breeder	4251 Simpson Rd SE	Rochester	MN	55904
William Schmidt	6013 Viola Rd NE	Rochester	MN	55906
Fieseler Farms	11702 40 <sup>th</sup> St SE	Eyota	MN	55934
Schoenfelder Farms	11279 55 <sup>th</sup> St SE	Eyota	MN	55934
Schoenfelder Farms	9516 Hwy 52 SE	Chatfield	MN	55923

Banking & Finance				
First Security Bank	316 Byron Ave N	Byron	MN	55920
First Alliance Credit Union	1011 Tompkins Dr NE	Byron	MN	55920
First Farmers and Merchants Bank	111 20th St NE	Stewartville	MN	55976
Wells Fargo Bank	300 N Main St	Stewartville	MN	55976
Bremer Bank	119 1st St E,	Stewartville	MN	55976
Bremer Bank	27 W 2nd St	Eyota	MN	55934
Pine Island Bank	128 S Main St	Pine Island	MN	55963
F & M Community Bank	229 Main St N	Chatfield	MN	55923
Root River State Bank	18 3rd St SE	Chatfield	MN	55923

Chemical and Hazardous Materials				
CHS Grain Elevator	302 Byron Ave N	Byron	MN	55920
All-American Co-Op	113 4th St SE	Stewartville	MN	55976
Farm Country Co-Op	417 N Main St	Pine Island	MN	55963

Chemical and Hazardous Materials				
All American Co-op	1 Center Ave S	Eyota	MN	55934
All-American Co-Op Chatfield	25 1st St SW	Chatfield	MN	55923

Commercial Facilities				
America's Best Inn	1700 2 <sup>nd</sup> Ave NW	Stewartville	MN	55976
Tilly's American Travelers Rv Park	1175 Lake Shady Ave S	Oronoco	MN	55960
Hidden Meadows RV Park Inc	6450 120th St NW	Pine Island	MN	55963
Marion KOA Journey	5232 65th Ave SE	Rochester	MN	55904
Chester Woods RV Park	8378 14 Hwy SE	Eyota	MN	55934
Oxbow RV Park and Zollman Zoo	5731 County Rd 105 NW	Byron	MN	55920
Oronoco Park	3 <sup>rd</sup> Ave NE off of 5 <sup>th</sup> St NW	Oronoco	MN	55960
Kwik Trip	16 2 <sup>nd</sup> Ave NW	Byron	MN	55920
Byron Market Place	863 High Point Pl NE	Byron	MN	55920
Byron Pet Clinic	25 Frontage Rd NE	Byron	MN	55920
Somerby Golf Club	975 Somerby Pkwy NE	Byron	MN	55920
Kwik Trip	101 Schumann Dr NW	Stewartville	MN	55976
Kwik Trip	410 Main St N	Stewartville	MN	55976
Casey's General Store	605 S Main St	Stewartville	MN	55976
Casey's General Store	102 20th St NW	Stewartville	MN	55976
Fareway Grocery	2012 2 <sup>nd</sup> Ave NE	Stewartville	MN	55976
Southside Storage	201 6 <sup>th</sup> St SE	Stewartville	MN	55976
M & M Storage	845 2 <sup>nd</sup> Ave SW	Stewartville	MN	55976
Strikers Corner	101 10th St NW	Stewartville	MN	55976
Jimmy's Salad Dressing	1711 2nd Ave NW	Stewartville	MN	55976
House Chevrolet	410 S Main St	Stewartville	MN	55976
Kwik Trip	380 Sandstone Dr NW	Eyota	MN	55934
American Legion Club	11 Madison Ave SW	Eyota	MN	55934
Eyota Market	501 Glen St SW	Eyota	MN	55934
Eyota Vet Clinic	95 Center Ave N	Eyota	MN	55934
Ferguson Trailer Sales	1734 County Rd 142 SE	Dover	MN	55929
Dave's Repair	297 Elm St E	Dover	MN	55929
Casey's	30 Energy Ln SW,	Oronoco	MN	55960
Oronoco Gas & Go	1455 Central Avenue Southeast	Oronoco	MN	55960
Tilly's Bar & Grill	1155 Lake Shady Ave S	Oronoco	MN	55960
Oronoco Self Storage	155 5th St SW	Oronoco	MN	55960
Kwik Trip	100 1st St NW	Pine Island	MN	55963
Island Market	201 N Main St	Pine Island	MN	55963
Greenway Cooperative	100 N Main St	Pine Island	MN	55963

Commercial Facilities				
Land O' Lakes Milk	206 2nd St NE	Pine Island	MN	55963
Pine Island Vehicle Bureau	250 S Main St	Pine Island	MN	55963
J & D Self Storage	222 Center Dr	Pine Island	MN	55963
Kwik Trip	150 MN-30	Chatfield	MN	55923
Sunshine Foods	237 Main St N	Chatfield	MN	55923

Communications				
Olmsted County/City of Rochester Dispatch Center	101 4 <sup>th</sup> Street SE	Rochester	MN	55904
Olmsted County EOC	1421 3 <sup>rd</sup> Ave SE	Rochester	MN	55904

Dams				
City of Rochester	50 <sup>th</sup> Ave NW			
Dresser Valley Watershed				
Elmira 1				
Glen Herman				
Glen Herman stabilizer				
Hoehne Bros. Pond				
La Moyne Detention				
Mayowood Lake				
Olmsted County Rd. 10				
Simonson Detention				
Sinn Group Str.				
South Branch Zumbro River				
South Zumbro BR-1				
South Zumbro KR-3				
South Zumbro KR-6				
South Zumbro KR-7				
South Zumbro SR-2				
South Zumbro WR-4				
South Zumbro WR-6A				

Educational Facilities				
Byron High School	1887 2nd Ave NW	Byron	MN	55920
Byron Middle School	601 4th St NW	Byron	MN	55920
Byron Middle School	501 10th Ave NE	Byron	MN	55920
Zumbro Area Learning Center	630 1st Ave NW	Byron	MN	55920

Educational Facilities				
Zumbro Education District - Futures/Choice Special Education	221 2nd Ave SW	Byron	MN	55920
Stewartville High School	400 6th Ave SW	Stewartville	MN	55976
Central Elementary School	301 Second Street SW	Stewartville	MN	55976
Bonner Elementary School	526 5th Ave SE	Stewartville	MN	55976
Bear Cave Intermediate School	1021 10th Street NW	Stewartville	MN	55976
Dover-Eyota High Jr/Sr high	615 South Ave SW	Eyota	MN	55934
Dover-Eyota Elementary	27 Knowledge Rd SW	Eyota	MN	55934
Dover-Eyota Intermediate School	217 W Center St	Dover	MN	55929
Chatfield Jr/Sr High School	205 Union St NE	Chatfield	MN	55923
Chatfield Elementary School	405 Main St S	Chatfield	MN	55923
Pine Island K-12	223 1st Ave SE,	Pine Island	MN	55963
Pine Island Elementary School	8749 125th St NW	Pine Island	MN	55963

Emergency Services				
Byron Fire Department	707 Frontage Rd NW	Byron	MN	55920
Oronoco Fire Department	60 2nd Street NW	Oronoco	MN	55960
Eyota Fire Department	14 S Front St SE	Eyota	MN	55934
Dover Fire Hall	221 Chatfield St N	Dover	MN	55929
Pine Island Fire Department	315 S Main St	Pine Island	MN	55963
Stewartville Fire Department	417 S Main St,	Stewartville	MN	55976
Chatfield Fire Department	322 Main St S	Chatfield	MN	55923
Chatfield Ambulance	21 2nd St SE Chatfield	Chatfield	MN	55923
Gold Cross Ambulance	501 6th Ave NW	Rochester	MN	55904
Eyota Volunteer Ambulance Service	753 Robert AVE SW	Eyota	MN	55934
Olmsted County Sheriff's Office	101 4th St SE	Rochester	MN	55904

Energy				
People's Energy Cooperative	1775 Lake Shady Ave S	Oronoco	MN	55960
Minnesota Energy Resources	3460 Technology Dr NW	Rochester	MN	55904
Xcel Energy	414 Nicollet Mall	Minneapolis	MN	55401
Southern Minnesota Municipal Power Agency (SMMPA)	500 1 <sup>st</sup> Ave SW	Rochester	MN	55902
Alliant Energy Corporation	216 Center Plaza N	Stewartville	MN	55976

Government Facilities				
Byron City Hall	680 Byron Main Ct NE	Byron	MN	55920
Chatfield City Hall	21 2nd St SE	Chatfield	MN	55923
Eyota City Hall	38 S Front St SW	Eyota	MN	55934
Stewartville City Hall	105 E 1St St Stewartville	Stewartville	MN	55976
Dover City Hall	218 NE Co Rd 10	Dover	MN	55929
Oronoco City Hall	115 2nd St NW	Oronoco	MN	55960
Pine Island City Hall	250 S Main St	Pine Island	MN	55963
Van Horn Public Library	115 3rd St SE	Pine Island	MN	55963
Stewartville Public Library	110 2nd St SE	Stewartville	MN	55976
Chatfield Public Library	314 Main St S	Chatfield	MN	55923
Byron Public Works	300 2nd Ave NW	Byron	MN	55920
Stewartville Public Works	601 N Main St	Stewartville	MN	55976
Eyota Public Works	422 South Ave SE	Eyota	MN	55934
Chatfield Public Works	322 Main St S	Chatfield	MN	55932
Oronoco Public Works/director	115 2nd St NW	Oronoco	MN	55960
Olmsted County Public Works	2122 Campus Dr SE	Rochester	MN	55904
Cascade Township Hall	2025 75 <sup>th</sup> St NE	Rochester	MN	55906
Dover Town Hall	229 Main St N	Dover	MN	55929
Elmira Town Hall	27 Winona St SE	Chatfield	MN	55923
Farmington Town Hall	11534 County Rd 128 NE	Elgin	MN	55923
Haverhill Town Hall	4000 55 <sup>th</sup> Ave NE	Rochester	MN	55904
High Forest Town Hall	417 ½ S Main St	Stewartville	MN	55976
Kalmar Town Hall	8507 Townhall Rd NW	Byron	MN	55920
Marion Town Hall	3746 50 <sup>th</sup> Ave SE	Rochester	MN	55904
New Haven Town Hall	9024 County Rd 3 NW	Oronoco	MN	55960
Orion Town Hall	9006 County Rd 7 SE	Chatfield	MN	55923
Oronoco Community Center	115 2 <sup>nd</sup> Ave SW	Oronoco	MN	55960
Pleasant Grove Town Hall	County Rd 140 SE	Stewartville	MN	55976
Quincy Town Hall	4605 County Rd 10 NE	St Charles	MN	55972
Rochester Town Hall	4111 11 <sup>th</sup> Ave SW	Rochester	MN	55902
Rock Dell Town Hall	8938 County Rd 3 SW	Hayfield	MN	55940
Salem Town Hall	County Rd 3 at Salem Rd SW	Byron	MN	55920
Viola Town Hall	4010 Center St NE	Viola	MN	55934
Olmsted County Highway Department (Eyota)	11 N Front St E	Eyota	MN	55934
Olmsted County Highway Department (Byron)	715 Frontage Rd NW	Byron	MN	55920
Olmsted County Highway Department (Dover)	236 Main St N	Dover	MN	55929
Olmsted County Jail	101 4 <sup>th</sup> St SE	Rochester	MN	55904
Law Enforcement Center	101 4 <sup>th</sup> St SE	Rochester	MN	55904

### Healthcare and Public Health

Weber & Judd Pharmacy	237 Main St N	Chatfield	MN	55923
Olmsted Medical Center - Chatfield	207 Twiford St SW	Chatfield	MN	55923
Olmsted Medical Center - Byron	846 High Point Drive NE	Byron	MN	55920
Olmsted Medical Center - Stewartville	208 Center Town Plaza N	Stewartville	MN	55976
Weber & Judd Pharmacy	220 Center Town Plz	Stewartville	MN	55976
Olmsted Medical Center - Pine Island	111 County Rd 11 NW	Pine Island	MN	55963
Weber & Judd Pharmacy	111 Cty Rd 11 NW, Box 646	Pine Island	MN	55963
Madonna Summit of Byron	551 Byron Main Court NE	Byron	MN	55920
Stewartville Care Center	120 4th St NE	Stewartville	MN	55976
Root River Estates	110 4 <sup>th</sup> St NE	Stewartville	MN	55976
Arbor Gardens	535 Canyon Dr NW	Eyota	MN	55934
Zumbro House Inc	308 105 <sup>th</sup> St NW	Oronoco	MN	55960
Chosen Valley Assisted Living	1260 Winona St SE	Chatfield	MN	55923
Pine Haven Care Center	210 3 <sup>rd</sup> St NW	Pine Island	MN	55963

### Manufacturing

Halcon	1811 2nd Ave NW	Stewartville	MN	55976
Schmidt Printing	1101 Frontage Rd NW	Byron	MN	55920
Geotek Inc	1421 2nd Ave NW	Stewartville	MN	55976

### Postal and Shipping

US Post Office	212 Main St N	Dover	MN	55929
US Post Office	10 N Minnesota Ave	Oronoco	MN	55960
US Post Office	245 Main St N	Chatfield	MN	55923
US Post Office	217 S Main St	Pine Island	MN	55963
US Post Office	218 Byron Ave N	Byron	MN	55920
US Post Office	120 2nd St SE	Stewartville	MN	55976
US Post Office	126 S Front St	Eyota	MN	55934
FedEx Ground	2427 Henry Rd NW	Stewartville	MN	55976

Transportation				
Grisim School Bus	628 6th St SE	Stewartville	MN	55976
Byron Public Schools Bus Garage	361 13th St NW, Byron, MN	Byron	MN	55920
Dover-Eyota Elementary School Bus System	27 Knowledge Rd SE	Eyota	MN	55934
Bernard Bus Services Inc	103 Division St NW	Chatfield	MN	55923
Rochester International Airport	7600 Helgerson Dr SW	Rochester	MN	55902

Water				
City of Stewartville Water Tower	640 20 <sup>th</sup> St NW	Stewartville	MN	55976
City of Stewartville Water Tower	602 6 <sup>th</sup> St SE	Stewartville	MN	55976
City of Stewartville Well House	130 2 <sup>nd</sup> St SE	Stewartville	MN	55976
City of Stewartville Sewage Treatment Facility	595 20 <sup>th</sup> St NE	Stewartville	MN	55976
City of Dover Water Tower	43.96450, -92.12337 – off of 6 <sup>th</sup> St SE	Dover	MN	55929
City of Oronoco Well House	1250 Valley View Ln SW	Oronoco	MN	55960
City of Chatfield Water Well	1 <sup>st</sup> St SE at 8 <sup>th</sup> Ave SE	Chatfield	MN	55923
City of Eyota Pump House – Well #1 & Well #2	Sunrise Park- South Ave SE at 4 <sup>th</sup> St SE	Eyota	MN	55934
City of Byron Wastewater Treatment Facility	124 20 <sup>th</sup> St NE	Byron	MN	55920
City of Byron Well #2	300 2 <sup>nd</sup> Ave NE	Byron	MN	55920
City of Byron Well #3	Old Towne Park – 208 Byron Avenue North	Byron	MN	55920
City of Byron West Water Tower	225 Hilldale Ct NE	Byron	MN	55920
City of Byron East Water Tower	695 12 <sup>th</sup> Ave NE	Byron	MN	55920

# Appendix C

## Olmsted County Hazard Events

The National Centers for Environmental Information storm events database was queried for all notable events since 1950. However, some categories of events do not have records prior to 1996. Data was available through December of 2016.

Table C - 1. All tornadoes recorded by NCEI, 1950-2016

Location or County	Date	Magnitude	Deaths	Injuries	Property Damage
Rock Dell	8/13/2010	EF0	0	0	0
Douglas	6/17/2010	EF1	0	0	\$1,900,000
Stewartville	5/1/2001	F0	0	0	0
Byron	6/24/1998	F0	0	0	0
Eyota	5/15/1998	F1	0	0	\$50,000
Rochester	8/13/1995	F0	0	0	\$70,000
Olmsted Co.	6/7/1984	F1	0	0	\$250,000
Olmsted Co.	5/17/1982	F0	0	0	\$25,000
Olmsted Co.	4/29/1981	F2	0	2	\$2,500,000
Olmsted Co.	4/29/1981	F0	0	0	0
Olmsted Co.	4/29/1981	F0	0	0	\$2,500
Olmsted Co.	6/5/1980	F1	0	0	\$250,000
Olmsted Co.	7/3/1979	F2	0	0	\$2,500,000
Olmsted Co.	6/18/1974	F1	0	2	\$25,000
Olmsted Co.	6/9/1974	F1	0	0	\$2,500
Olmsted Co.	9/26/1973	F1	0	1	\$25,000
Olmsted Co.	6/7/1971	F0	0	0	0
Olmsted Co.	6/7/1971	F0	0	0	\$2,500
Olmsted Co.	4/30/1967	F2	0	0	\$25,000,000
Olmsted Co.	6/25/1966	F0	0	0	\$25,000
Olmsted Co.	5/25/1964	F0	0	0	\$25,000
Olmsted Co.	4/13/1964	F2	0	0	\$250,000
Olmsted Co.	10/4/1962	F0	0	0	0
Olmsted Co.	9/16/1962	F4	0	34	\$250,000
Olmsted Co.	9/16/1962	F2	0	0	\$25,000
Olmsted Co.	6/17/1962	F1	0	0	\$25,000
Olmsted Co.	5/22/1962	F0	0	0	0
Olmsted Co.	5/22/1962	F2	0	0	\$25,000
Olmsted Co.	6/30/1956	F0	0	0	0
Olmsted Co.	5/10/1953	F4	1	6	\$2,500,000
<b>Highest Value Property Damage</b>					<b>\$25,000,000</b>

Table C - 2. All severe hail storm events recorded by NCEI, 1950-2016

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Rochester	9/21/2016	0.75	0	0	0
Rochester	6/29/2015	0.88	0	0	0
Rochester	6/29/2015	1	0	0	0
Rochester	6/29/2015	1	0	0	0
Rochester Muni	6/29/2015	1.5	0	0	0
Rochester Muni	6/29/2015	0.75	0	0	0
Douglas	5/7/2015	0.75	0	0	0
Rochester	5/3/2015	0.75	0	0	0
Dover	5/3/2015	1	0	0	0
Genoa	8/18/2014	1	0	0	0
Genoa	8/18/2014	1.25	0	0	\$10,000
Genoa	6/16/2014	0.88	0	0	0
Stewartville	5/8/2014	0.75	0	0	0
Stewartville	5/8/2014	1	0	0	0
Chester	5/8/2014	0.88	0	0	0
Rochester	6/22/2013	1	0	0	0
Rochester	6/21/2013	0.88	0	0	0
Stewartville	6/21/2013	0.75	0	0	0
Rochester	6/21/2013	0.75	0	0	0
Eyota	5/31/2013	0.75	0	0	0
Rochester Muni	5/31/2013	1	0	0	0
Stewartville	5/31/2013	0.75	0	0	0
Marion	5/31/2013	1.5	0	0	0
Simpson	5/31/2013	1.75	0	0	0
Pleasant Grove	5/31/2013	0.88	0	0	0
Predmore	5/31/2013	1	0	0	0
Laird	5/31/2013	1	0	0	0
Byron	5/26/2012	0.75	0	0	0
Salem Corners	5/26/2012	0.75	0	0	0
Simpson	8/13/2010	1	0	0	0
Eyota	8/13/2010	0.88	0	0	0
Rochester	6/26/2010	0.75	0	0	0
Simpson	6/26/2010	0.88	0	0	0
Byron	6/17/2010	1	0	0	0
Chester	5/25/2010	0.75	0	0	0
Chatfield Jct	5/25/2010	0.75	0	0	0
Oronoco	7/24/2009	0.75	0	0	0
Stewartville	7/24/2009	1	0	0	\$5,000
Stewartville	7/24/2009	1	0	0	\$12,000

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Rochester	7/21/2009	0.75	0	0	0
Rochester	4/24/2009	1	0	0	0
Rochester	4/24/2009	0.75	0	0	0
Rochester	4/24/2009	1	0	0	0
Rochester Muni	8/27/2008	0.88	0	0	0
Judge	8/14/2008	1	0	0	\$300
Dover	7/15/2008	1	0	0	0
Dover	7/15/2008	0.88	0	0	0
Oronoco	7/10/2008	0.75	0	0	0
Byron	7/10/2008	1	0	0	0
Rochester	7/10/2008	0.75	0	0	0
Chatfield Jct	7/10/2008	0.75	0	0	0
Rochester	7/10/2008	0.75	0	0	0
Stewartville	7/10/2008	1	0	0	0
Oronoco	5/31/2008	0.75	0	0	0
Rochester	5/31/2008	0.75	0	0	0
Byron	5/30/2008	0.75	0	0	0
Rochester	5/30/2008	1	0	0	\$5,000
Rochester	5/30/2008	1	0	0	\$10,000
Rochester	5/30/2008	1	0	0	\$10,000
Rochester	5/30/2008	1.75	0	0	\$20,000
Dover	5/6/2008	0.75	0	0	0
Byron	8/14/2007	0.88	0	0	0
Rochester	8/14/2007	1	0	0	0
Rochester	8/11/2007	0.75	0	0	0
Rochester	8/11/2007	0.75	0	0	0
Chatfield Jct	8/11/2007	0.75	0	0	0
Byron	8/11/2007	0.75	0	0	0
Genoa	8/11/2007	0.75	0	0	0
Salem Corners	8/11/2007	1	0	0	0
Rochester	8/11/2007	0.75	0	0	0
Rochester	8/11/2007	1.75	0	0	0
Rochester Muni	8/11/2007	1	0	0	0
Rochester	8/11/2007	1	0	0	0
Rochester Muni	8/11/2007	1	0	0	0
Rochester	8/11/2007	1.25	0	0	0
Simpson	8/11/2007	1	0	0	0
Rochester	6/21/2007	0.75	0	0	0
Rochester	6/21/2007	1	0	0	\$10,000
Rock Dell	10/4/2006	1	0	0	\$15,000

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
High Forest	10/4/2006	1	0	0	\$15,000
Rochester Muni	10/4/2006	0.88	0	0	\$10,000
Rochester	8/24/2006	1.75	0	0	\$2,500
Potsdam	8/24/2006	0.75	0	0	0
Viola	8/24/2006	1	0	0	\$800
Oronoco	8/24/2006	1.75	0	0	\$1,500
Oronoco	8/24/2006	1.75	0	0	\$2,000
Oronoco	8/24/2006	0.75	0	0	0
Oronoco	8/24/2006	1	0	0	\$1,500
Oronoco	8/24/2006	0.75	0	0	0
Oronoco	8/24/2006	1	0	0	0
Oronoco	8/24/2006	1.75	0	0	0
Oronoco	8/24/2006	0.75	0	0	0
Oronoco	8/24/2006	1	0	0	\$3,000
Oronoco	8/24/2006	0.75	0	0	0
Rochester	8/24/2006	1	0	0	\$5,000
Rochester	8/24/2006	1.75	0	0	0
Byron	8/24/2006	0.75	0	0	0
Oronoco	7/19/2006	0.75	0	0	0
Eyota	7/25/2005	1	0	0	0
Rochester	6/8/2005	0.88	0	0	0
Rochester	6/7/2005	0.88	0	0	\$50,000
Rochester	6/7/2005	1	0	0	\$50,000
Rochester	6/7/2005	0.75	0	0	\$2,000
Rochester	6/7/2005	1	0	0	\$50,000
Rochester	6/7/2005	1	0	0	\$30,000
Oronoco	6/7/2005	1	0	0	\$5,000
Rochester	6/7/2005	1	0	0	\$20,000
Oronoco	6/7/2005	0.88	0	0	0
Dover	3/30/2005	0.75	0	0	0
Chatfield	8/26/2004	0.88	0	0	0
Rochester	6/8/2004	1	0	0	\$800
Byron	5/9/2004	0.75	0	0	0
Potsdam	5/9/2004	1	0	0	\$1,000
Douglas	5/9/2004	0.88	0	0	0
Potsdam	5/9/2004	1	0	0	\$750
Pleasant Grove	5/8/2004	0.88	0	0	0
Pleasant Grove	5/8/2004	0.88	0	0	0
Byron	4/17/2004	0.88	0	0	0
Rock Dell	4/17/2004	0.88	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Stewartville	4/17/2004	0.88	0	0	0
Stewartville	4/17/2004	0.75	0	0	0
Stewartville	4/17/2004	0.88	0	0	0
Stewartville	4/17/2004	0.75	0	0	0
Stewartville	4/17/2004	1	0	0	\$1,250
Genoa	4/17/2004	0.75	0	0	0
Rochester	7/21/2002	0.75	0	0	0
Rochester	7/21/2002	0.75	0	0	0
Byron	7/18/2002	0.75	0	0	0
Rochester	6/4/2002	1	0	0	\$4,500
Rochester	6/4/2002	1	0	0	\$2,000
Salem Corners	5/8/2002	0.75	0	0	0
Byron	5/8/2002	0.75	0	0	0
Byron	5/8/2002	1	0	0	\$1,500
Genoa	5/8/2002	1	0	0	0
Rochester	5/8/2002	1	0	0	\$7,500
Douglas	5/8/2002	1	0	0	0
Rochester	5/8/2002	1.25	0	0	\$8,500
Stewartville	4/18/2002	0.75	0	0	0
Rochester	4/18/2002	0.75	0	0	0
Eyota	12/5/2001	0.75	0	0	0
Byron	6/18/2001	1	0	0	0
Rochester	6/18/2001	1.25	0	0	\$10,000
Byron	6/18/2001	0.75	0	0	0
Byron	6/18/2001	0.88	0	0	\$500
Byron	6/18/2001	0.75	0	0	0
Oronoco	6/18/2001	0.88	0	0	0
Potsdam	6/18/2001	1	0	0	0
Rochester	6/18/2001	0.75	0	0	0
Dover	6/18/2001	1.25	0	0	\$1,500
Potsdam	6/11/2001	1	0	0	\$750
Chatfield	6/11/2001	1.25	0	0	\$500
Rochester	5/1/2001	1.75	0	0	\$7,500
Rochester	5/1/2001	1	0	0	\$5,000
Stewartville	5/1/2001	0.75	0	0	0
Cummingsville	9/10/2000	1.5	0	0	\$15,000
Cummingsville	9/10/2000	2.5	0	0	\$25,000
Chatfield	9/10/2000	0.75	0	0	\$1,000
Chatfield	9/10/2000	1.25	0	0	\$9,000
Dover	9/10/2000	0.75	0	0	\$1,500

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Dover	9/10/2000	2	0	0	\$20,000
Dover	9/10/2000	1	0	0	\$8,500
Dover	9/10/2000	2.5	0	0	\$22,000
Chatfield	9/10/2000	1.5	0	0	\$18,000
Oronoco	8/26/2000	0.75	0	0	\$5,000
Genoa	8/26/2000	0.75	0	0	0
Potsdam	8/1/2000	1	0	0	\$12,000
Oronoco	8/1/2000	0.75	0	0	\$1,500
Oronoco	8/1/2000	1	0	0	\$14,000
Oronoco	8/1/2000	1.5	0	0	\$15,000
Rochester	8/1/2000	1.75	0	0	\$75,000
Rock Dell	5/17/2000	1.75	0	0	\$5,000
Rock Dell	5/17/2000	1	0	0	0
Rochester	5/17/2000	1	0	0	\$25,000
Rochester	5/17/2000	1	0	0	\$18,000
Rochester	5/17/2000	1	0	0	\$15,000
Rochester	8/9/1999	0.88	0	0	\$750,000
Rochester	8/9/1999	1.75	0	0	\$1,250,000
Rochester	8/9/1999	1	0	0	\$1,000,000
Rochester	8/9/1999	1	0	0	\$500,000
Rochester	8/9/1999	1.25	0	0	\$1,500,000
Chester	8/9/1999	2	0	0	\$30,000
Potsdam	7/8/1999	2	0	0	0
Rochester	5/16/1999	1	0	0	0
Eyota	5/16/1999	0.75	0	0	0
Oronoco	6/26/1998	0.88	0	0	\$15,000
Oronoco	6/26/1998	0.88	0	0	0
Byron	6/24/1998	0.75	0	0	0
Rochester	6/24/1998	1.75	0	0	\$25,000
Oronoco	5/18/1998	0.75	0	0	\$10,000
Rochester	5/18/1998	0.75	0	0	0
Rochester	5/18/1998	0.75	0	0	\$8,000
Rochester	5/18/1998	1	0	0	\$20,000
Rochester	5/18/1998	1.5	0	0	\$30,000
Salem Corners	3/29/1998	0.88	0	0	0
Byron	3/29/1998	0.75	0	0	0
Byron	3/29/1998	2.5	0	0	\$40,000
Rochester	3/29/1998	1	0	0	\$20,000
Rochester	3/29/1998	1.5	0	0	\$250,000
Rochester	3/29/1998	2	0	0	\$50,000

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
High Forest	7/16/1997	0.75	0	0	0
Rochester	7/13/1997	0.75	0	0	0
Rochester	7/13/1997	0.88	0	0	\$25,000
Rochester Arpt	7/5/1997	0.88	0	0	0
Rochester	7/5/1997	0.75	0	0	0
Rochester	6/28/1997	0.75	0	0	0
Eyota	6/5/1997	0.88	0	0	0
Eyota	6/5/1997	0.88	0	0	0
Pleasant Grove	6/5/1997	0.75	0	0	0
Oronoco	6/29/1996	2.75	0	0	0
Eyota	8/13/1995	0.75	0	0	0
Rochester	7/30/1994	1.25	0	0	\$5,000
Marion	7/30/1994	1	0	0	\$500
High Forest	7/30/1994	2.75	0	0	\$5,000
Salem Corners	5/30/1994	2.75	0	0	\$500
Rochester	5/30/1994	1	0	0	\$500
Simpson	8/18/1993	0.75	0	0	0
Olmsted Co.	5/16/1992	1	0	0	0
Olmsted Co.	5/27/1991	1	0	0	0
Olmsted Co.	5/27/1991	2.75	0	0	0
Olmsted Co.	3/13/1990	1.75	0	0	0
Olmsted Co.	8/4/1989	1	0	0	0
Olmsted Co.	8/4/1989	1	0	0	0
Olmsted Co.	8/4/1989	1	0	0	0
Olmsted Co.	8/4/1989	1.5	0	0	0
Olmsted Co.	8/4/1989	1.25	0	0	0
Olmsted Co.	5/24/1989	0.75	0	0	0
Olmsted Co.	6/14/1988	1.5	0	0	0
Olmsted Co.	7/14/1987	1.5	0	0	0
Olmsted Co.	8/9/1985	0.75	0	0	0
Olmsted Co.	7/9/1985	1	0	0	0
Olmsted Co.	7/17/1983	1.75	0	0	0
Olmsted Co.	7/25/1982	1.5	0	0	0
Olmsted Co.	4/29/1981	1.5	0	0	0
Olmsted Co.	4/3/1981	1.75	0	0	0
Olmsted Co.	4/3/1981	2.5	0	0	0
Olmsted Co.	7/11/1980	1.75	0	0	0
Olmsted Co.	6/5/1980	1	0	0	0
Olmsted Co.	6/5/1980	0.75	0	0	0
Olmsted Co.	6/5/1980	0.75	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Olmsted Co.	6/28/1979	1.5	0	0	0
Olmsted Co.	7/5/1978	1.75	0	0	0
Olmsted Co.	6/30/1978	1.5	0	0	0
Olmsted Co.	7/30/1977	1.75	0	0	0
Olmsted Co.	6/4/1977	1	0	0	0
Olmsted Co.	6/20/1974	0.75	0	0	0
Olmsted Co.	6/20/1974	1.75	0	0	0
Olmsted Co.	6/20/1974	1.5	0	0	0
Olmsted Co.	6/18/1974	1	0	0	0
Olmsted Co.	6/3/1974	1.75	0	0	0
Olmsted Co.	7/3/1973	1.75	0	0	0
Olmsted Co.	8/20/1972	1.75	0	0	0
Olmsted Co.	7/12/1971	2	0	0	0
Olmsted Co.	6/10/1971	0.75	0	0	0
Olmsted Co.	8/11/1970	1.75	0	0	0
Olmsted Co.	6/13/1970	0.75	0	0	0
Olmsted Co.	5/22/1970	0.75	0	0	0
Olmsted Co.	5/22/1970	1	0	0	0
Olmsted Co.	8/16/1968	2.5	0	0	0
Olmsted Co.	6/10/1968	1	0	0	0
Olmsted Co.	4/30/1967	1	0	0	0
Olmsted Co.	4/30/1967	1.75	0	0	0
Olmsted Co.	8/7/1966	1	0	0	0
Olmsted Co.	7/18/1965	0.75	0	0	0
Olmsted Co.	7/15/1965	1.5	0	0	0
Olmsted Co.	5/5/1965	0.75	0	0	0
Olmsted Co.	5/3/1965	1.75	0	0	0
Olmsted Co.	11/3/1964	1	0	0	0
Olmsted Co.	8/16/1963	3	0	0	0
Olmsted Co.	7/16/1963	1.5	0	0	0
Olmsted Co.	7/16/1963	1.5	0	0	0
Olmsted Co.	6/8/1963	0.75	0	0	0
Olmsted Co.	6/17/1962	1.75	0	0	0
Olmsted Co.	8/4/1961	0.75	0	0	0
Olmsted Co.	8/4/1961	1	0	0	0
Olmsted Co.	7/4/1961	0.75	0	0	0
Olmsted Co.	6/10/1961	1.75	0	0	0
Olmsted Co.	8/16/1959	1.5	0	0	0
Olmsted Co.	5/10/1959	1	0	0	0

Location or County	Date	Size in Inches	Deaths	Injuries	Property Damage
Highest Value Property Damage					\$1,500,000

Table C - 3. All severe thunderstorm wind events recorded by NCEI, 1950-2016

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Stewartville	8/18/2016	Thunderstorm Wind	52	0	0	0
Rock Dell	8/18/2016	Thunderstorm Wind	56	0	0	0
Stewartville	7/5/2016	Thunderstorm Wind	56	0	0	\$35,000
Rochester	7/5/2016	Thunderstorm Wind	52	0	0	\$25,000
Genoa	7/5/2016	Thunderstorm Wind	65	0	0	\$4,000
Genoa	7/5/2016	Thunderstorm Wind	52	0	0	0
Chatfield	5/26/2016	Thunderstorm Wind	50	0	0	\$1,000
Olmsted County	4/2/2016	Strong Wind	48	0	0	\$200
Olmsted County	3/16/2016	Strong Wind	45	0	0	\$5,000
Eyota	8/18/2014	Thunderstorm Wind	52	0	0	0
Stewartville	7/7/2014	Thunderstorm Wind	50	0	0	\$3,000
Olmsted Co.	6/16/2014	High Wind	51	0	0	0
Genoa	6/16/2014	Thunderstorm Wind	56	0	0	0
Rochester Muni	6/16/2014	Thunderstorm Wind	50	0	0	\$200
Eyota	8/22/2013	Thunderstorm Wind	55	0	0	\$10,000
Rochester	6/22/2013	Thunderstorm Wind	55	0	0	\$5,000
Eyota	6/22/2013	Thunderstorm Wind	55	0	0	\$2,000
Rochester Muni	5/19/2013	Thunderstorm Wind	52	0	0	\$2,000
Rochester	9/4/2012	Thunderstorm Wind	64	0	0	\$500,000
Rochester	9/4/2012	Thunderstorm Wind	64	0	0	0
Genoa	6/14/2012	Thunderstorm Wind	50	0	0	\$3,000
Byron	6/14/2012	Thunderstorm Wind	50	0	0	\$12,000
Douglas	6/14/2012	Thunderstorm Wind	54	0	0	0
Judge	5/26/2012	Thunderstorm Wind	60	0	0	0
Byron	3/19/2012	Thunderstorm Wind	52	0	0	\$800,000
Rochester Muni	3/19/2012	Thunderstorm Wind	50	0	0	0
Judge	7/1/2011	Thunderstorm Wind	50	0	0	0
Laird	7/1/2011	Thunderstorm Wind	55	0	0	0
Olmsted Co.	10/26/2010	High Wind	55	0	0	\$7,000
Oronoco	8/13/2010	Thunderstorm Wind	60	0	0	\$5,000
Stewartville	8/13/2010	Thunderstorm Wind	70	0	0	\$5,000
Stewartville	8/13/2010	Thunderstorm Wind	70	0	0	\$20,000
Rochester Muni	7/14/2010	Thunderstorm Wind	52	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Rochester	6/26/2010	Thunderstorm Wind	48	0	0	\$4,000
Laird	6/26/2010	Thunderstorm Wind	52	0	0	0
Eyota	6/26/2010	Thunderstorm Wind	52	0	0	0
Dover	6/26/2010	Thunderstorm Wind	52	0	0	0
Rock Dell	6/17/2010	Thunderstorm Wind	65	0	0	0
Byron	6/17/2010	Thunderstorm Wind	70	0	0	0
Laird	6/17/2010	Thunderstorm Wind	63	0	0	0
Potsdam	5/4/2010	Thunderstorm Wind	50	0	0	\$800
Rochester Muni	5/4/2010	Thunderstorm Wind	51	0	0	0
Rochester	7/21/2009	Thunderstorm Wind	55	0	0	\$5,000
Olmsted (Zone)	5/20/2009	Strong Wind	48	0	0	\$200
Judge	7/31/2008	Thunderstorm Wind	53	0	0	0
Potsdam	7/10/2008	Thunderstorm Wind	51	0	0	0
Rochester Muni	8/11/2007	Thunderstorm Wind	64	0	0	0
Rochester Muni	7/26/2007	Thunderstorm Wind	54	0	0	0
Byron	7/8/2007	Thunderstorm Wind	55	0	0	\$500
Rochester	7/8/2007	Thunderstorm Wind	53	0	0	\$2,500
Douglas	7/3/2007	Thunderstorm Wind	56	0	0	0
Genoa	7/3/2007	Thunderstorm Wind	50	0	0	0
High Forest	6/21/2007	Thunderstorm Wind	61	0	0	\$30,000
Laird	6/7/2007	Thunderstorm Wind	55	0	0	\$1,000
Oronoco	8/24/2006	Thunderstorm Wind	52	0	0	\$250
Oronoco	8/24/2006	Thunderstorm Wind	50	0	0	\$500
Douglas	8/24/2006	Thunderstorm Wind	52	0	0	\$750
Byron	8/24/2006	Thunderstorm Wind	52	0	0	0
Rochester Arpt	8/24/2006	Thunderstorm Wind	52	0	0	0
Rock Dell	8/24/2006	Thunderstorm Wind	52	0	0	0
Rochester Arpt	8/24/2006	Thunderstorm Wind	57	0	0	0
Rochester Arpt	8/24/2006	Thunderstorm Wind	64	0	0	0
Rochester	8/24/2006	Thunderstorm Wind	55	0	0	\$500
Rochester	8/24/2006	Thunderstorm Wind	54	0	0	\$750
Stewartville	8/24/2006	Thunderstorm Wind	60	0	0	\$30,000
Byron	7/14/2006	Thunderstorm Wind	55	0	0	\$100
Stewartville	5/29/2006	Thunderstorm Wind	52	0	0	0
Stewartville	6/13/2005	Thunderstorm Wind	52	0	0	0
Byron	6/8/2005	Thunderstorm Wind	51	0	0	\$100
Rochester	6/8/2005	Thunderstorm Wind	52	0	0	\$300
Little Vly	6/7/2005	Thunderstorm Wind	55	0	0	\$1,500
Chester	3/30/2005	Thunderstorm Wind	54	0	0	\$5,000
Olmsted Co.	12/12/2004	High Wind	50	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Pleasant Grove	6/11/2004	Thunderstorm Wind	56	0	0	\$750
Olmsted Co.	4/18/2004	High Wind	52	0	0	\$8,000
Stewartville	4/17/2004	Thunderstorm Wind	56	0	0	0
Byron	7/4/2003	Thunderstorm Wind	55	0	0	\$2,500
Byron	7/30/2002	Thunderstorm Wind	57	0	0	\$2,500
Rochester	7/30/2002	Thunderstorm Wind	61	0	0	0
Rochester	7/30/2002	Thunderstorm Wind	52	0	0	0
Eyota	7/30/2002	Thunderstorm Wind	52	0	0	0
Chatfield	7/30/2002	Thunderstorm Wind	55	0	0	\$7,500
Rochester	7/21/2002	Thunderstorm Wind	52	0	0	0
Rochester	7/21/2002	Thunderstorm Wind	50	0	0	0
Olmsted Co.	10/25/2001	High Wind	48	0	0	0
Genoa	6/18/2001	Thunderstorm Wind	52	0	0	0
Dover	6/18/2001	Thunderstorm Wind	70	0	0	\$1,000
Rochester	5/1/2001	Thunderstorm Wind	52	0	0	0
Eyota	5/1/2001	Thunderstorm Wind	52	0	0	0
Stewartville	4/11/2001	Thunderstorm Wind	52	0	0	0
Olmsted Co.	4/7/2001	High Wind	54	0	0	\$4,500
Olmsted Co.	4/5/2000	High Wind	50	0	0	0
Byron	6/6/1999	Thunderstorm Wind	60	0	0	\$25,000
Stewartville	6/6/1999	Thunderstorm Wind	52	0	0	\$20,000
Rochester	6/6/1999	Thunderstorm Wind	54	0	0	\$25,000
Rochester	6/6/1999	Thunderstorm Wind	56	0	0	\$70,000
Rochester	6/6/1999	Thunderstorm Wind	52	0	0	\$45,000
Rochester Arpt	6/5/1999	Thunderstorm Wind	51	0	0	0
Rochester	6/5/1999	Thunderstorm Wind	55	0	0	\$100,000
Olmsted Co.	11/10/1998	High Wind	49	0	0	\$60,000
Oronoco	7/20/1998	Thunderstorm Wind	52	0	0	\$15,000
Potsdam	7/20/1998	Thunderstorm Wind	52	0	0	\$12,000
Predmore	7/20/1998	Thunderstorm Wind	52	0	0	0
Oronoco	6/27/1998	Thunderstorm Wind	53	0	0	0
Stewartville	6/27/1998	Thunderstorm Wind	56	0	0	\$10,000
Stewartville	6/27/1998	Thunderstorm Wind	70	0	0	\$3,000
Oronoco	6/27/1998	Thunderstorm Wind		0	0	\$24,000
Rochester	6/27/1998	Thunderstorm Wind	70	0	0	\$320,000
Stewartville	6/27/1998	Thunderstorm Wind	61	0	0	\$4,000
Dover	6/27/1998	Thunderstorm Wind	52	0	0	\$35,000
Dover	6/27/1998	Thunderstorm Wind	70	0	0	\$4,000
Oronoco	6/26/1998	Thunderstorm Wind	70	0	0	\$20,000
Oronoco	6/26/1998	Thunderstorm Wind	61	0	0	\$10,000

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Dover	6/26/1998	Thunderstorm Wind	61	0	0	\$10,000
Byron	6/18/1998	Thunderstorm Wind	58	0	0	\$2,000
Byron	6/18/1998	Thunderstorm Wind	61	0	0	\$2,000
Salem Corners	6/18/1998	Thunderstorm Wind		0	0	\$500
Rochester	5/30/1998	Thunderstorm Wind	60	0	0	\$25,000
Rochester	5/30/1998	Thunderstorm Wind	65	0	0	\$75,000
Byron	5/30/1998	Thunderstorm Wind	50	0	0	0
Eyota	5/30/1998	Thunderstorm Wind	56	0	0	\$40,000
Rochester	5/30/1998	Thunderstorm Wind	53	0	0	\$35,000
Byron	5/30/1998	Thunderstorm Wind	53	0	0	0
Rochester Arpt	5/15/1998	Thunderstorm Wind	56	0	0	0
Dover	5/15/1998	Thunderstorm Wind	56	0	0	\$65,000
Eyota	5/15/1998	Thunderstorm Wind	52	0	0	0
Rochester	7/18/1997	Thunderstorm Wind	50	0	0	\$4,500
Rochester	7/17/1997	Thunderstorm Wind	52	0	0	\$12,500
Rochester	7/17/1997	Thunderstorm Wind	50	0	0	\$14,000
Rochester	7/16/1997	Thunderstorm Wind	52	0	0	\$3,500
Byron	7/13/1997	Thunderstorm Wind	56	0	0	\$12,000
Rochester	7/13/1997	Thunderstorm Wind	55	0	0	\$55,000
Eyota	7/13/1997	Thunderstorm Wind	55	0	0	\$8,000
Olmsted Co.	4/6/1997	High Wind	57	0	0	\$25,000
Olmsted Co.	10/30/1996	High Wind	52	0	0	\$25,000
Rochester	8/25/1996	Thunderstorm Wind	52	0	0	\$500
Byron	5/19/1996	Thunderstorm Wind	80	0	0	\$900,000
Stewartville	5/19/1996	Thunderstorm Wind	70	0	0	0
Oronoco	5/19/1996	Thunderstorm Wind	70	0	0	0
Olmsted Co.	2/10/1996	High Wind	48	0	0	0
Stewartville	8/13/1995	Thunderstorm Wind	64	0	0	0
Byron	6/22/1995	Thunderstorm Wind	56	0	0	0
Rock Dell	6/22/1995	Thunderstorm Wind	50	0	0	0
Rochester	6/22/1995	Thunderstorm Wind	55	0	0	0
Rochester	5/13/1995	Thunderstorm Wind	60	0	0	0
Salem Corners	5/30/1994	Thunderstorm Wind	0	0	0	\$500
Rochester	5/30/1994	Thunderstorm Wind	0	0	0	\$500
Oronoco	8/18/1993	Thunderstorm Wind	70	0	0	0
Rochester	8/18/1993	Thunderstorm Wind	70	0	0	0
Eyota	8/18/1993	Thunderstorm Wind	65	0	0	0
Olmsted Co.	9/16/1992	Thunderstorm Wind	56	0	0	0
Olmsted Co.	6/17/1992	Thunderstorm Wind	60	0	0	0
Olmsted Co.	5/16/1992	Thunderstorm Wind	52	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Olmsted Co.	5/16/1992	Thunderstorm Wind	0	0	0	0
Olmsted Co.	4/26/1991	Thunderstorm Wind	0	0	0	0
Olmsted Co.	8/26/1990	Thunderstorm Wind	52	0	0	0
Olmsted Co.	6/2/1990	Thunderstorm Wind	60	0	0	0
Olmsted Co.	8/4/1989	Thunderstorm Wind	0	0	0	0
Olmsted Co.	5/12/1988	Thunderstorm Wind	59	0	0	0
Olmsted Co.	8/16/1987	Thunderstorm Wind	56	0	0	0
Olmsted Co.	7/23/1987	Thunderstorm Wind	55	0	0	0
Olmsted Co.	7/8/1987	Thunderstorm Wind	0	0	0	0
Olmsted Co.	7/5/1987	Thunderstorm Wind	56	0	0	0
Olmsted Co.	7/30/1986	Thunderstorm Wind	59	0	0	0
Olmsted Co.	9/8/1985	Thunderstorm Wind	61	0	0	0
Olmsted Co.	8/6/1985	Thunderstorm Wind	0	0	0	0
Olmsted Co.	5/14/1985	Thunderstorm Wind	55	0	0	0
Olmsted Co.	5/11/1985	Thunderstorm Wind	64	0	0	0
Olmsted Co.	10/16/1984	Thunderstorm Wind	0	0	0	0
Olmsted Co.	7/16/1984	Thunderstorm Wind	62	0	0	0
Olmsted Co.	6/7/1984	Thunderstorm Wind	59	0	0	0
Olmsted Co.	4/27/1984	Thunderstorm Wind	0	0	0	0
Olmsted Co.	4/27/1984	Thunderstorm Wind	50	0	0	0
Olmsted Co.	4/27/1984	Thunderstorm Wind	74	0	0	0
Olmsted Co.	7/1/1983	Thunderstorm Wind	64	0	0	0
Olmsted Co.	7/1/1983	Thunderstorm Wind	64	0	0	0
Olmsted Co.	9/12/1982	Thunderstorm Wind	52	0	0	0
Olmsted Co.	9/12/1982	Thunderstorm Wind	54	0	0	0
Olmsted Co.	6/28/1981	Thunderstorm Wind	50	0	0	0
Olmsted Co.	6/23/1981	Thunderstorm Wind	56	0	0	0
Olmsted Co.	4/30/1981	Thunderstorm Wind	52	0	0	0
Olmsted Co.	4/29/1981	Thunderstorm Wind	56	0	0	0
Olmsted Co.	4/3/1981	Thunderstorm Wind	52	0	0	0
Olmsted Co.	9/3/1980	Thunderstorm Wind	52	0	0	0
Olmsted Co.	8/25/1980	Thunderstorm Wind	68	0	0	0
Olmsted Co.	8/19/1980	Thunderstorm Wind	50	0	0	0
Olmsted Co.	8/7/1980	Thunderstorm Wind	70	0	0	0
Olmsted Co.	7/12/1980	Thunderstorm Wind	53	0	0	0
Olmsted Co.	7/11/1980	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/18/1980	Thunderstorm Wind	61	0	0	0
Olmsted Co.	6/5/1980	Thunderstorm Wind	0	0	0	0
Olmsted Co.	8/4/1979	Thunderstorm Wind	53	0	0	0
Olmsted Co.	7/3/1979	Thunderstorm Wind	50	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Olmsted Co.	6/26/1979	Thunderstorm Wind	56	0	0	0
Olmsted Co.	6/19/1979	Thunderstorm Wind	56	0	0	0
Olmsted Co.	5/30/1979	Thunderstorm Wind	59	0	0	0
Olmsted Co.	8/15/1978	Thunderstorm Wind	55	0	0	0
Olmsted Co.	7/5/1978	Thunderstorm Wind	52	0	0	0
Olmsted Co.	11/20/1977	Thunderstorm Wind	53	0	0	0
Olmsted Co.	6/7/1977	Thunderstorm Wind	56	0	0	0
Olmsted Co.	6/4/1977	Thunderstorm Wind	52	0	0	0
Olmsted Co.	5/15/1977	Thunderstorm Wind	55	0	0	0
Olmsted Co.	7/30/1976	Thunderstorm Wind	57	0	0	0
Olmsted Co.	6/26/1976	Thunderstorm Wind	61	0	0	0
Olmsted Co.	6/13/1976	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/13/1976	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/13/1976	Thunderstorm Wind	58	0	0	0
Olmsted Co.	8/24/1975	Thunderstorm Wind	54	0	0	0
Olmsted Co.	6/17/1975	Thunderstorm Wind	0	0	0	0
Olmsted Co.	5/23/1975	Thunderstorm Wind	85	0	0	0
Olmsted Co.	6/20/1974	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/20/1974	Thunderstorm Wind	51	0	0	0
Olmsted Co.	6/18/1974	Thunderstorm Wind	72	0	0	0
Olmsted Co.	6/18/1973	Thunderstorm Wind	54	0	0	0
Olmsted Co.	5/11/1973	Thunderstorm Wind	55	0	0	0
Olmsted Co.	7/12/1971	Thunderstorm Wind	76	0	0	0
Olmsted Co.	6/24/1971	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/24/1971	Thunderstorm Wind	58	0	0	0
Olmsted Co.	6/24/1971	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/19/1971	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/19/1971	Thunderstorm Wind	75	0	0	0
Olmsted Co.	6/19/1971	Thunderstorm Wind	0	0	0	0
Olmsted Co.	8/29/1970	Thunderstorm Wind	0	0	0	0
Olmsted Co.	7/18/1970	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/17/1970	Thunderstorm Wind	62	0	0	0
Olmsted Co.	8/6/1969	Thunderstorm Wind	0	0	0	0
Olmsted Co.	8/6/1969	Thunderstorm Wind	50	0	0	0
Olmsted Co.	6/26/1969	Thunderstorm Wind	52	0	0	0
Olmsted Co.	6/26/1969	Thunderstorm Wind	0	0	0	0
Olmsted Co.	9/3/1968	Thunderstorm Wind	0	0	0	0
Olmsted Co.	8/6/1968	Thunderstorm Wind	57	0	0	0
Olmsted Co.	6/10/1968	Thunderstorm Wind	55	0	0	0
Olmsted Co.	8/1/1967	Thunderstorm Wind	57	0	0	0

Location or County	Date	Type	Magnitude (Knots)	Deaths	Injuries	Property Damage
Olmsted Co.	3/30/1967	Thunderstorm Wind	55	0	0	0
Olmsted Co.	6/25/1966	Thunderstorm Wind	55	0	0	0
Olmsted Co.	5/25/1964	Thunderstorm Wind	70	0	0	0
Olmsted Co.	5/23/1964	Thunderstorm Wind	72	0	0	0
Olmsted Co.	6/8/1963	Thunderstorm Wind	61	0	0	0
Olmsted Co.	6/17/1962	Thunderstorm Wind	0	0	0	0
Olmsted Co.	5/22/1962	Thunderstorm Wind	55	0	0	0
Olmsted Co.	7/30/1961	Thunderstorm Wind	0	0	0	0
Olmsted Co.	7/30/1961	Thunderstorm Wind	0	0	0	0
Olmsted Co.	6/12/1961	Thunderstorm Wind	52	0	0	0
Olmsted Co.	6/10/1961	Thunderstorm Wind	52	0	0	0
Olmsted Co.	8/3/1960	Thunderstorm Wind	70	0	0	0
Olmsted Co.	8/16/1959	Thunderstorm Wind	50	0	0	0
Olmsted Co.	6/22/1956	Thunderstorm Wind	53	0	0	0
Olmsted Co.	6/22/1956	Thunderstorm Wind	0	0	0	0
<b>Highest Value Property Damage</b>						<b>\$900,000</b>

Table C - 4. All extreme flood events recorded by NCEI, 1997-2016

Location or County	Date	Type	Deaths	Injuries	Property Damage
Rochester	9/22/2016	Flood	0	0	0
Genoa	9/21/2016	Flash Flood	0	0	\$2,000
Rochester	8/17/2014	Flood	0	0	0
Byron	6/18/2014	Flood	0	0	0
Rock Dell	6/16/2014	Flash Flood	0	0	0
Rochester	6/16/2014	Flood	0	0	\$10,000
Rochester	8/22/2013	Flash Flood	0	0	\$400,000
Rochester	8/22/2013	Flood	0	0	\$35,000
Rochester	6/22/2013	Flood	0	0	0
Byron	3/30/2013	Flood	0	0	0
Douglas	7/28/2011	Flood	0	0	0
Salem Corners	7/23/2011	Flood	0	0	0
Douglas	7/15/2011	Flood	0	0	\$25,000
Little Vly	3/22/2011	Flood	0	0	0
Oronoco	9/24/2010	Flash Flood	0	0	\$7,000,000
Little Vly	9/23/2010	Flood	0	0	0
Cummingsville	9/23/2010	Flood	0	0	\$3,550,000

Location or County	Date	Type	Deaths	Injuries	Property Damage
Rochester	9/23/2010	Flood	0	0	0
Rochester	9/23/2010	Flood	0	0	0
Rochester	8/13/2010	Flood	0	0	0
Little Vly	8/13/2010	Flood	0	0	0
Rock Dell	6/12/2008	Flood	0	0	\$15,000
Viola	6/8/2008	Flood	0	0	\$50,000
Rochester	8/19/2007	Flood	0	0	\$20,000
Rochester	8/19/2007	Flood	0	0	\$20,000
Rochester	8/18/2007	Flash Flood	0	0	\$35,000,000
Eyota	8/18/2007	Flash Flood	0	0	\$9,600,000
Olmsted (Zone)	9/15/2004	Flood	0	0	\$425,000
Countywide	9/14/2004	Flash Flood	0	0	\$7,500
Countywide	6/9/2004	Flash Flood	0	0	0
Countywide	6/11/2002	Flash Flood	0	0	\$3,500
Countywide	4/11/2001	Flash Flood	0	0	\$1,000
Countywide	6/20/2000	Flood	0	0	\$4,000
Countywide	6/1/2000	Flood	0	0	\$10,000
Countywide	5/17/2000	Flood	0	0	0
Dover	8/23/1999	Flash Flood	0	0	\$1,000
Rochester	6/27/1998	Flash Flood	0	0	\$15,000
Byron	6/27/1998	Flood	0	0	0
Byron	7/13/1997	Flood	0	0	0
<b>Highest Value Property Damage</b>					<b>\$35,000,000</b>

Table C - 5. All severe winter weather events recorded by NCEI, 1996-2016

Location or County	Date	Type	Deaths	Injuries	Property Damage
Olmsted (Zone)	12/10/2016	Heavy Snow	0	0	0
Olmsted County	3/23/2016	Winter Storm	0	0	0
Olmsted (Zone)	2/2/2016	Winter Storm	0	0	0
Olmsted (Zone)	12/28/2015	Winter Storm	0	0	0
Olmsted (Zone)	11/30/2015	Winter Weather	0	0	\$14,000
Olmsted (Zone)	3/22/2015	Heavy Snow	0	0	\$7,500
Olmsted (Zone)	1/8/2015	Blizzard	0	0	0
Olmsted (Zone)	3/4/2014	Heavy Snow	0	0	0
Olmsted (Zone)	2/20/2014	Blizzard	0	0	\$15,000
Olmsted (Zone)	1/26/2014	Blizzard	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Olmsted (Zone)	5/1/2013	Heavy Snow	0	0	\$50,000
Olmsted (Zone)	4/11/2013	Ice Storm	0	0	\$20,000
Olmsted (Zone)	3/10/2013	Winter Storm	0	0	0
Olmsted (Zone)	3/4/2013	Heavy Snow	0	0	0
Olmsted (Zone)	2/21/2013	Winter Storm	0	0	0
Olmsted (Zone)	1/27/2013	Winter Storm	0	0	\$15,000
Olmsted (Zone)	12/19/2012	Winter Storm	0	0	0
Olmsted (Zone)	3/16/2011	Winter Weather	0	0	\$10,000
Olmsted (Zone)	2/20/2011	Winter Storm	0	0	0
Olmsted (Zone)	2/3/2011	Winter Weather	0	0	\$4,000
Olmsted (Zone)	12/20/2010	Winter Storm	0	0	0
Olmsted (Zone)	12/11/2010	Winter Storm	0	0	0
Olmsted (Zone)	12/11/2010	Blizzard	0	0	0
Olmsted (Zone)	12/3/2010	Heavy Snow	0	0	0
Olmsted (Zone)	11/24/2010	Winter Weather	0	0	\$5,000
Olmsted (Zone)	2/7/2010	Winter Storm	0	0	0
Olmsted (Zone)	1/25/2010	Winter Weather	0	0	0
Olmsted (Zone)	12/23/2009	Winter Storm	0	0	0
Olmsted (Zone)	12/8/2009	Blizzard	0	0	0
Olmsted (Zone)	2/26/2009	Winter Storm	0	0	0
Olmsted (Zone)	1/12/2009	Winter Storm	0	0	0
Olmsted (Zone)	1/3/2009	Winter Weather	0	0	0
Olmsted (Zone)	12/27/2008	Winter Weather	0	0	0
Olmsted (Zone)	12/20/2008	Winter Storm	0	0	0
Olmsted (Zone)	12/8/2008	Winter Storm	0	0	0
Olmsted (Zone)	3/20/2008	Heavy Snow	0	0	0
Olmsted (Zone)	1/29/2008	Winter Storm	0	0	0
Olmsted (Zone)	1/29/2008	Blizzard	0	0	0
Olmsted (Zone)	1/21/2008	Winter Weather	0	0	0
Olmsted (Zone)	12/1/2007	Winter Storm	0	0	0
Olmsted (Zone)	4/10/2007	Winter Storm	0	0	0
Olmsted (Zone)	3/1/2007	Winter Storm	0	0	0
Olmsted (Zone)	2/28/2007	Winter Storm	0	0	0
Olmsted (Zone)	2/24/2007	Blizzard	0	0	0
Olmsted (Zone)	2/23/2007	Winter Storm	0	0	0
Olmsted (Zone)	2/6/2007	Heavy Snow	0	0	0
Olmsted (Zone)	1/14/2007	Heavy Snow	0	0	0
Olmsted (Zone)	11/10/2006	Heavy Snow	0	0	0
Olmsted (Zone)	2/15/2006	Winter Storm	0	0	0
Olmsted (Zone)	12/13/2005	Heavy Snow	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
Olmsted (Zone)	3/17/2005	Winter Storm	0	0	0
Olmsted (Zone)	2/20/2005	Winter Storm	0	0	0
Olmsted (Zone)	1/22/2005	Blizzard	0	0	0
Olmsted (Zone)	1/21/2005	Winter Storm	0	0	0
Olmsted (Zone)	1/1/2005	Ice Storm	0	0	0
Olmsted (Zone)	2/1/2004	Winter Storm	0	0	0
Olmsted (Zone)	1/26/2004	Winter Storm	0	0	0
Olmsted (Zone)	12/9/2003	Winter Storm	0	0	0
Olmsted (Zone)	11/22/2003	Ice Storm	0	0	0
Olmsted (Zone)	4/7/2003	Winter Storm	0	0	0
Olmsted (Zone)	3/9/2002	Blizzard	1	5	\$50,000
Olmsted (Zone)	3/11/2001	Winter Storm	0	0	0
Olmsted (Zone)	2/24/2001	Ice Storm	0	0	0
Olmsted (Zone)	2/8/2001	Winter Storm	0	0	0
Olmsted (Zone)	2/7/2001	Winter Storm	0	0	0
Olmsted (Zone)	1/29/2001	Ice Storm	0	0	0
Olmsted (Zone)	12/28/2000	Winter Storm	0	0	0
Olmsted (Zone)	12/18/2000	Winter Storm	0	0	0
Olmsted (Zone)	1/19/2000	Winter Storm	0	0	0
Olmsted (Zone)	1/2/2000	Heavy Snow	0	0	0
Olmsted (Zone)	3/8/1999	Winter Storm	0	0	0
Olmsted (Zone)	2/11/1999	Winter Storm	0	0	0
Olmsted (Zone)	1/20/1998	Heavy Snow	0	0	0
Olmsted (Zone)	1/4/1998	Ice Storm	0	1	0
Olmsted (Zone)	3/12/1997	Winter Storm	0	0	0
Olmsted (Zone)	2/4/1997	Winter Storm	0	0	0
Olmsted (Zone)	1/24/1997	Heavy Snow	0	0	0
Olmsted (Zone)	1/15/1997	Winter Storm	0	0	0
Olmsted (Zone)	12/27/1996	Winter Weather	0	0	\$50,000
Olmsted (Zone)	12/23/1996	Winter Storm	0	0	0
Olmsted (Zone)	11/20/1996	Winter Storm	0	0	\$90,000
Olmsted (Zone)	3/23/1996	Heavy Snow	0	0	0
Olmsted (Zone)	1/28/1996	Blizzard	0	0	0
Olmsted (Zone)	1/26/1996	Blizzard	0	0	0
Olmsted (Zone)	1/25/1996	Heavy Snow	0	0	0
Olmsted (Zone)	1/17/1996	Heavy Snow	0	0	0
<b>Highest Value Property Damage</b>					<b>\$90,000</b>

Table C - 6. All severe cold/wind chill events recorded by NCEI, 1996-2016

Location or County	Date	Type	Deaths	Injuries	Property Damage
Olmsted (Zone)	12/17/2016	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/17/2016	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/15/2016	Cold/Wind Chill	1	0	0
Olmsted (Zone)	1/7/2015	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	12/2/2014	Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/27/2014	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/5/2014	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	2/24/2010	Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/28/2010	Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/8/2010	Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/1/2010	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	12/10/2009	Cold/Wind Chill	0	0	0
Olmsted (Zone)	3/11/2009	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/14/2009	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	12/21/2008	Cold/Wind Chill	0	0	0
Olmsted (Zone)	12/14/2008	Cold/Wind Chill	0	0	0
Olmsted (Zone)	2/10/2008	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/29/2008	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	2/2/2007	Extreme Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/16/1997	Cold/Wind Chill	0	0	0
Olmsted (Zone)	2/1/1996	Cold/Wind Chill	0	0	0
Olmsted (Zone)	1/31/1996	Cold/Wind Chill	0	0	0
<b>Highest Value Property Damage</b>					0

Table C - 7. All extreme heat/heat events recorded by the NCEI, 1996-2016

Location or County	Date	Type	Deaths	Injuries	Property Damage
Olmsted County	7/21/2016	Heat	0	0	0
Olmsted (Zone)	8/29/2013	Heat	1	0	0
Olmsted (Zone)	7/2/2012	Heat	0	0	0
Olmsted (Zone)	7/17/2011	Excessive Heat	0	0	\$23,000
Olmsted (Zone)	8/1/2001	Heat	0	0	0
Olmsted (Zone)	7/31/2001	Heat	0	0	0
Olmsted (Zone)	7/28/1999	Heat	1	0	0
Olmsted (Zone)	7/23/1999	Heat	0	0	0
Olmsted (Zone)	7/4/1999	Heat	0	0	0

Location or County	Date	Type	Deaths	Injuries	Property Damage
<b>Highest Value Property Damage</b>					<b>\$23,000</b>

Table C - 8. All lightning events recorded by the NCEI, 1996-2016

Location or County	Date	Deaths	Injuries	Property Damage
Marion	9/21/2016	0	0	\$30,000
Rochester	7/7/2016	0	0	\$20,000
Rochester Muni	4/8/2015	0	0	\$2,500
Rochester	8/22/2013	0	0	\$5,000
Rochester Muni	7/25/2013	0	0	\$5,000
Rochester	6/22/2013	0	0	\$10,000
Rochester	5/31/2013	0	0	\$5,000
Chester	5/31/2013	0	0	\$25,000
Rochester	9/5/2012	0	0	\$40,000
Rochester	9/4/2012	0	0	\$45,000
Rochester	7/24/2012	0	0	\$3,000
Marion	5/1/2012	0	0	\$30,000
Rochester	8/23/2011	0	0	\$1,000
Rochester	7/28/2011	0	0	\$5,000
Rochester	6/14/2011	0	0	\$2,000
Byron	7/21/2005	0	0	\$1,600,000
Rochester	6/26/2002	0	0	\$3,500
Rochester	5/16/1999	0	0	\$25,000
<b>Highest Value Property Damage</b>				<b>\$1,600,000</b>

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# Appendix D

## Adopting Resolutions

*Resolutions to be added to Appendix D by Olmsted County following final approval of the plan by FEMA.*

# Appendix E

## Steering Committee Meetings

# Minnesota 10-County Multi-Hazard Mitigation Update Project Kick-off Orientation Webinar

UNIVERSITY OF MINNESOTA GEOSPATIAL ANALYSIS CENTER



## Webinar Purpose & Goals

**Purpose:**

The purpose of this webinar is provide an orientation kick-off meeting for the Emergency Managers participating in the Minnesota 10-County Multi-Hazard Mitigation Plan Update project.

**Goals:**

- Introduce the UMD Team and County contacts.
- Provide an overview of the project.
- Clarify roles and responsibilities.
- Outline the planning process, discuss key tasks and timelines.
- Discuss next steps and answer your questions.

## Introductions

**Who We Are (UMD Project Team)**



Stacey Stark, Director, Geospatial Analysis Center (GAC)



Micaella Penning, Research Associate, GIS Specialist, Cartographer, and Editor (GAC)



Steve Graham, Research Associate and Flood Modeling Specialist (GAC)



Bonnie Hundrieser, Emergency Management Planning Consultant (Hundrieser Consulting LLC)

**Who You Are (County Emergency Managers):**

- \*Name, Title, and County
- \*Past Experience with MHMP?

**Minnesota HSEM:**

Jennifer Nelson, MN HSEM, State Hazard Mitigation Officer

## Project Overview

➤ **10 Counties**

Jurisdiction	FEMA's Expiration Date
Beeton	2/16/2017
Crow Wing	8/25/2016
Faribault	5/20/2013
Freeborn	5/18/2015
Grant	5/18/2015
Hubbard	3/23/2016
Olmsted	5/18/2015
Steele	12/5/2016
Wabasha	8/31/2015
Wilkin	8/30/2016





## Why UMD-GAC?

➤ **Proven experience**

GAC has extensive experience in the comprehensive review and update of county MHMPs, as well as update of the State MHMP.

➤ **Advanced Capabilities**

GAC has expertise in the application of GIS, HAZUS, and research to support MHMP development and meeting all FEMA requirements.

➤ **Ability to Expedite**

GAC has the ability to expedite the MHMP update process for multiple counties through a consistent approach and format, which also supports State and FEMA review of draft plans.

➤ **Planning Team**

GAC project team includes working with advanced GIS students and experienced consultants to effectively complete tasks.

## EM Roles & Responsibilities

- Act as main Point of Contact.
- Coordinate communication and outreach to engage local planning team, additional key stakeholders, and the public.
- Review past mitigation actions and provide status update.
- Provide information for Capabilities Assessment (Plans & Programs in Place / Program Gaps or Deficiencies) for each hazard.
- Assist in development of new mitigation action chart (must be county and jurisdictionally specific) that includes projects for HMA eligibility.
- Provide information for Critical Facilities forms.
- Provide coordination with GIS and assessor's data managers in order to obtain GIS and parcel information for GIS analyses.
- Assist in timely review of material throughout the plan update process via phone, email, and in-person meetings.
- Track required local match and submit to HSEM.

## MHMP Updates & Crosswalk Requirements

*Key Considerations for Discussion*

## HM Plan Contents

- Hazard Mitigation Planning overview and process
- County physical and social profile
- Asset Inventory
- Hazard Profiles
- Hazard Assessment and Vulnerability Analysis
- Mitigation Actions and Strategy
- Plan Maintenance

## Planning Process

Each Emergency Manager will play a critical role in identification and engagement of a planning team and the public throughout the update process. The MHMP must document who was involved & how, and include representation from the county, each jurisdiction, neighboring communities, local and regional agencies.

**Key Considerations for MHMP Updates:**

- What tools do you use to communicate? (i.e., Facebook, email, etc.)
- What standing events or committees might you use in this process? (local emergency preparedness committees, County/City board meetings, county fair, etc.)
- How do you plan to address:
  - Jurisdictional Engagement
  - Stakeholder Engagement (who are they?)
  - Public Engagement

## Hazard Identification and Risk Assessment

All plans will address the **natural hazards** identified to pose risk to the county and its jurisdictions. Non-natural hazards (technological and human-caused) will not be included in the risk and vulnerability assessment and development of mitigation strategies and actions.

**Key Considerations for MHMP Updates:**

- Identify specific impacts and vulnerabilities (at the county/jurisdiction level) due to natural hazards.
- Identify if and how any priorities changed since the last plan (i.e., financial, legal, political realities, and post-disaster conditions).
- Identify existing development or future development that may increase or decrease the community's vulnerability to natural hazard events.

## Mitigation Strategy

Key activities to support the update of the Mitigation Strategy will include a capabilities assessment for mitigating against natural hazards, as well as a comprehensive review of the status of mitigation strategies and actions in the previously approved plan.

**Key Considerations for MHMP Updates:**

- Plans and Programs in Place that support mitigation.
- Program Gaps or Deficiencies that hinder mitigation.
- Identification of projects that may be eligible for HMA funding.
- Inclusion of other eligible agency or organizational stakeholders in development & implementation of mitigation actions (i.e., Public Utilities, MN DNR, School Districts, Boy Scouts of America).

## Plan Adoption

After FEMA has provided "APA" status (Approval Pending Adoption), the county and all participating jurisdictions must formally adopt the plan.

**Key Considerations for MHMP Updates:**

- This step is often a difficult challenge for Emergency Managers after the plan is completed, and can bog down the process of final plan adoption and thus eligibility for applying for FEMA HMA funding.
- Are there communication measures to be used during the planning process to minimize this issue? What steps do you think can be taken to make this process easier for your current plan update?

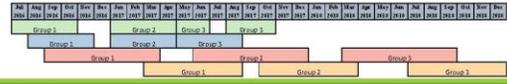
## Project Timeline

- 36 - Month timeline
- Staggering of Counties will be required to complete UMD's update of risk assessments, research of hazard histories, etc. for each county.
- All county Emergency Managers will be provided with resources to work on independently. Customized worksheets and technical assistance will be provided to you to facilitate the process.
  - Capabilities Assessment by each Natural Hazard
  - Status Update on Prior Mitigation Actions
  - Compilation of Critical & Essential Facilities in each jurisdiction

## Estimated Time-line

Group 1: Faribault, Freeborn, Olmsted, Grant  
 Group 2: Wabasha, Hubbard, Wilkin  
 Group 3: Crow Wing, Steele, Benton

	WHAT	CONSULTANT ROLES	COUNTY ROLES
A	research, obtaining information, review previous mitigation actions	student and GIS analyst work, dependent on student schedules	work can be done with minimal interaction with county
B	flood data preparation and flood analysis	GIS analyst work - done in immediate succession	
C	planning meetings, develop mitigation actions	planner work, groups need to be in succession, stage C must be complete before stage D in each county	frequent interaction with county necessary
D	complete draft plan and public meetings		



## Questions?

What questions do you have for UMD or HSEM about the MHMP Update process?

## Contact Information

Stacey Stark, MS, GISP  
 Geospatial Analysis Center  
[slstark@d.umn.edu](mailto:slstark@d.umn.edu)  
 218-726-7438

**Olmsted County  
Multi-Hazard Mitigation Plan Update**

October 24, 2016 MHMP Planning Team Meeting  
Canadian Honker Events at Apache - Rochester, MN  
10:00 a.m. – 12:00 p.m.



**Meeting Summary:**

On Monday, October 24, 2016, key county, city, and township representatives, as well as other stakeholders were convened to participate in a Planning Team Meeting for the update of Olmsted County Multi-Hazard Mitigation Plan (MHMP). The meeting was facilitated by the University of Minnesota – Duluth Geospatial Analysis Center (GAC) staff and Bonnie Hundrieser who are leading the update of the Olmsted County MHMP. A total of 46 people attended the meeting.

The opening presentation covered:

- The purpose of hazard mitigation planning.
- The role & responsibilities of the Planning Team.
- An overview of content in the MHMP (County physical & social profile, Asset Inventory, Hazard Assessment and Vulnerability Analysis, Capability Assessment and Mitigation Actions).
- A review of mitigation strategies and considerations for developing local mitigation actions.
- An overview of the FEMA Hazard Mitigation Assistance (HMA) Grants program.

Following the presentation a facilitated Mitigation Action Working Session was held. Participants discussed the natural hazards of concern to their communities and filled out Mitigation Action Worksheets to identify new, jurisdictionally-specific mitigation actions to be included in the MHMP plan update. Mitigation actions were required to fall within one of the 5 mitigation action strategies being used for the Minnesota MHMP plan updates:

1. Local Planning and Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

Following the Mitigation Action Working Session, the group then discussed the upcoming process and anticipated timeline for engaging the public and other key stakeholders in an open plan review period and public meetings. Meeting attendees were told that they would be contacted for additional information as needed and kept informed on the upcoming steps in the planning process, including opportunities for draft plan review and final selection of mitigation actions for inclusion in the plan.

**Attached to this meeting summary are the following documentation items:**

- Olmsted County Meeting Email Invite
- 10-24-16 Meeting Agenda
- 10-24-16 Meeting Sign-in Sheets
- 10-24-16 Power Point Presentation Slides

*Meeting Summary Prepared By:  
Bonnie Hundrieser, UMD Project Team, (Hundrieser Consulting LLC)*

**From:** Deets Cassie  
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**Cc:**  
**Subject:** Multi-Hazard Mitigation Plan - Participation Needed  
**Date:** Friday, September 16, 2016 3:01:55 PM  
**Importance:** High

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Greetings,

Your presence is requested at a Planning Team meeting for the update of the **Olmsted County Multi-Hazard Mitigation Plan** on:

**Date:** Monday, October 24<sup>th</sup>

**Time:** 10:00 a.m. – 12:00 p.m.

**Location:** Canadian Honker Events at Apache (Kahler Apache) – 1517 16<sup>th</sup> Street SW Rochester, MN 55902

The update of the County’s hazard mitigation plan is a requirement by the State of Minnesota Department of Homeland Security & Emergency Management (HSEM) as well as the Federal Emergency Management Agency (FEMA) every 5 years. Our plan is due for an update and our planning is currently underway. The plan addresses the natural hazards that face Olmsted County and will result in mitigation actions for implementation that will reduce or eliminate loss of life or damage to property as a result of natural hazard events. Your input as needed as being part of a County department or city jurisdiction within the county. Additional key stakeholders have also been invited.

**Your participation in this hazard mitigation plan is important for several reasons:**

1. You will have input on projects we can implement at the county and local level that will help to eliminate or reduce the impacts of future natural disaster events.
2. Participating cities and the County may be eligible to apply for significant federal mitigation funding from FEMA to implement specific projects that meet eligibility requirements.
3. Mitigation planning is a fundamental element in emergency management and local planning that we all must address to keep our communities safe and resilient.
4. FEMA and the State of Minnesota require that local jurisdictions participate in the planning process. Your participation is important so that the County can ensure that we meet this requirement.

During this brief 2 hour meeting we will discuss & rank the hazards that face our county and discuss mitigation actions to include in the plan. The meeting will be facilitated by the University of Minnesota – Duluth Geospatial Analysis Center and Bonnie Hundrieser, an emergency

management planning consultant working closely with us on this project.

**We request that you RSVP to this invitation by October 17, 2016.** If you cannot attend, we do ask that you seek to send someone in your stead to represent your county department/city jurisdiction/or other organization.

If you have any questions, please do not hesitate to contact me.

Thank you,

Deputy Cassie Deets #1013  
Deputy Director of Emergency Management  
Olmsted County Sheriff's Office  
Cell: 507-330-5901  
Direct: 507-328-6102

# Olmsted County Multi-Hazard Mitigation Plan Update

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## Planning Team Meeting

Monday, October 24, 2016, 10:00 a.m – 12:00 p.m.  
Canadian Honker Events at Apache - Rochester, MN

### Presenting:

- Micaella Penning, University of Minnesota –Duluth, Geospatial Analysis Center
- Bonnie Hundrieser, Hundrieser Consulting LLC

### Agenda:

1. Welcome and Introductions
2. Olmsted County MHMP Plan Update (Micaella Penning)
  - *About the Plan*
  - *Planning Team*
  - *Plan Content*
3. Review of Mitigation Strategies and Developing Mitigation Actions (Bonnie Hundrieser)
4. Hazard Mitigation Assistance (HMA) Grants
5. Mitigation Action Working Session

### Contact:

*For more information on the Olmsted County MHMP Update, please contact:*

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Olmsted County 10/24/16 Planning Team Meeting  
Participant Sign-in List (46 attendees)

Olmsted County MHMP Update Monday, October 24, 2016 Planning Team Meeting Participant List		
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**Olmsted County – Multi Hazard Mitigation Plan Update  
 Planning Team Meeting – Monday, October 24, 2016**

**PARTICIPANT SIGN IN SHEET**

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10/26/2016

**Olmsted County  
Multi-Hazard Mitigation Plan Update**

October 24<sup>th</sup>, 2016  
Planning Meeting



**Agenda**

1. Welcome and Introductions
2. MHMP Plan Update Overview
  - About the Plan
  - Planning Team
  - Plan Content
3. Review of Mitigation Strategies and Developing Mitigation Actions
4. Hazard Mitigation Assistance (HMA) Grants
5. Mitigation Action Working Session

**About your UMD Project Team**

SWENSON COLLEGE  
OF SCIENCE & ENGINEERING  
UNIVERSITY OF MINNESOTA DULUTH  
Driven to Discover

- The **Geospatial Analysis Center (GAC) at the University of Minnesota Duluth** was contracted by Minnesota HSEM to facilitate the development of this plan and to conduct spatial analysis, mapping and research for the plan.
- The GAC has worked on 13 MHMP's (2011-2016) and is currently working on 10 county MHMP updates in Minnesota.
- Working with the GAC is **Bonnie Hundrieser**, who specializes in Emergency Management planning.

**About the Plan**

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). **The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.**

**MHMP's must:**

- Be updated every 5 years
- Identify hazards and conduct a risk assessment
- Include goals, strategies, and mitigation actions
- Address all jurisdictions (county/cities)
- Engage stakeholder and include public participation

**What is Hazard Mitigation?**

- HM is **sustained action** to reduce or eliminate long-term risk to people and their property from hazards.
- HM Planning is the process local government use to **identify risks and vulnerabilities** associated with natural disasters, and **develop long-term strategies** for protecting people and property from future hazard events.
- HM planning allows communities to **strategically plan for and work together** to implement activities that are cost effective, technically feasible and environmentally sound .... **BEFORE a disaster strikes.**
- A dollar spent on mitigation grants leads to an average of \$3.65 in avoided post-disaster relief costs and increased federal tax revenues.

**The MHMP Planning Team**

An MHMP **must** be developed with the participation of jurisdictional (county/city) representatives and other key stakeholders. This group is referred to as the "Planning Team".

**The role of the Planning Team is to help:**

1. Rank hazards, prioritize mitigation strategies and identify specific projects for implementation.
2. Assist with public outreach and participate in public meetings.
3. Review the draft plan and provide feedback.
4. Facilitate final adoption of the MHMP by local government.

10/26/2016

### Content of the MHMP

- County physical and social profile
- Asset Inventory
- Hazard Assessment and Vulnerability Analysis
- Capability Assessment
- Mitigation Actions

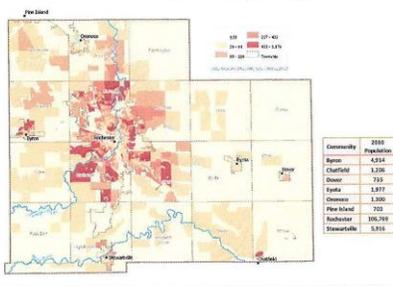
### Olmsted County



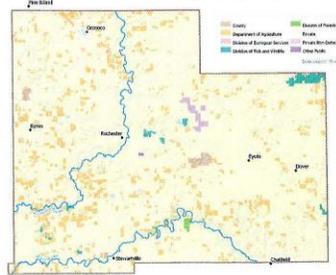
This is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville.

The City of Rochester is not included, as it has its own Multi-Hazard Mitigation Plan.

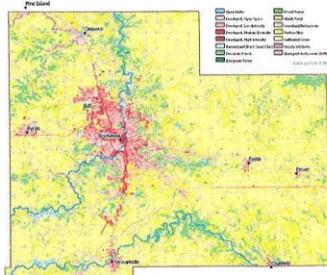
### Olmsted County, 2010 pop. 144,248



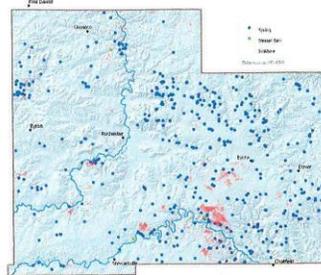
### Land Ownership by Agency



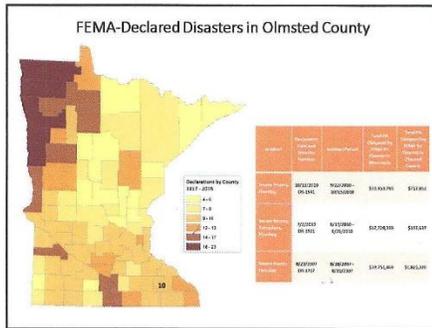
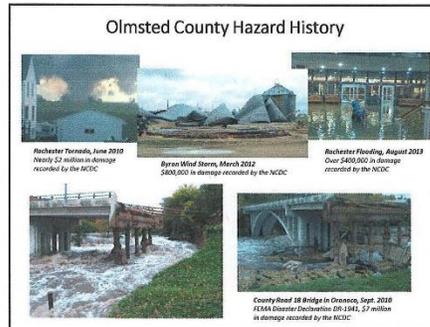
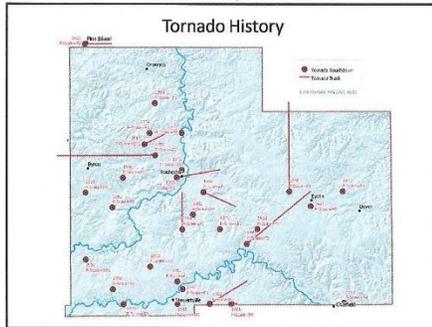
### Land Cover



### Karst Features



10/26/2016



### What Hazards are Addressed?

A Multi-Hazard Mitigation Plan looks primarily at natural disasters, including:

Flooding	Hail	Drought
Dam/Levee Failure	Lightning	Extreme Heat
Wildfire	Winter Storms	Extreme Cold
Windstorms	Erosion	Earthquakes
Tornadoes	Land Subsidence (Sinkholes & Karst)	

*Hazard Categories from the Minnesota State Plan*

Manmade hazards are not required by the DMA 2000 to be addressed in the MHMP.

### How are Hazards Identified & Ranked for a Community?

- Previous Hazard Events
- Historical Data (National Climatic Data Center)
- Previous MHMP's
- Calculated Priority Risk Index (CPRI)

**CPRI Risk Factors**  
PROBABILITY  
MAGNITUDE/SEVERITY  
WARNING TIME  
DURATION

### Priorities of Risks Faced by Olmsted County (2016)

The following hazards rankings for Olmsted County are based on the on the past 2009 MHMP and 2015 THIRA.

They are provided for discussion for inclusion in the 2016 MHMP Update.

Natural Hazards	Risk Severity
Flash Flood & Riverine Flood	High
Severe Winter Storms	High
Severe Summer Storms (Thunderstorms, Lightning, Hailstorms, Windstorms, Tornadoes)	Moderate
Extreme Heat & Extreme Cold	Moderate
Erosion / Land Subsidence (Sinkholes & Karst)	Moderate
Drought	Low
Dam Failure	Low
Wildfire	Low

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### Review of Mitigation Capabilities

Multi-Hazard Mitigation Plans require that each jurisdiction **must** document the existing authorities, policies, programs, and resources in place for mitigation.

- What **plans and programs** are in place to support mitigation against that hazard?
- What **program gaps or deficiencies** exist to support mitigation against that hazard?

### Mitigation Strategy #1: Local Planning and Regulations

**Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.**

*Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.*

### Mitigation Strategy #2: Structure and Infrastructure Projects

**Actions that involve the construction of structures to reduce the impact of a hazard, such as dams, levees, floodwalls, seawalls, retaining walls, and safe rooms; and actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.**

*Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass. Climate Resilient Mitigation Actions include flood diversion and storage and green infrastructure. This mitigation strategy includes road/bridge/culvert projects for local flood mitigation.*

### Mitigation Strategy #3: Natural Systems Protection

**Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems.**

*These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, wetland restoration and preservation, aquifer storage and recovery and floodplain and stream restoration.*

### Mitigation Strategy #4: Education and Awareness Programs

**Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.**

*Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.*

### Mitigation Strategy #5: Mitigation Preparedness & Response Support

*(HSEM added strategy for use in the state)*

**Actions that protect people and property prior to, during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.**

*These activities are not typically considered mitigation, but support reduction of the effects of damaging events.*

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### Mitigation Actions Update

*So far, the following has been completed in the review of mitigation actions in the last MHMP:*

1. What mitigation actions **have been completed** since the last plan was adopted.
2. What mitigation actions **should be deleted**.
3. What mitigation actions **have not been completed or may be an on-going action** to roll-over into the new plan.

### Next Steps in Developing Actions

1. Identify specific mitigation strategies and actions at the jurisdictional level based on the community's risk and vulnerabilities.
2. Consider priority, timeframe, who's responsible, and what is in place to support implementation.
3. Consider potential funding and cost/benefit.
4. Engage key partners and stakeholders in providing local expertise and feedback.
5. Provide opportunities for public involvement and feedback in the planning process.

### FEMA's Hazard Mitigation Assistance (HMA) Grant Program

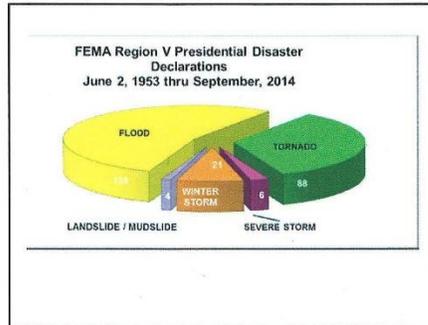
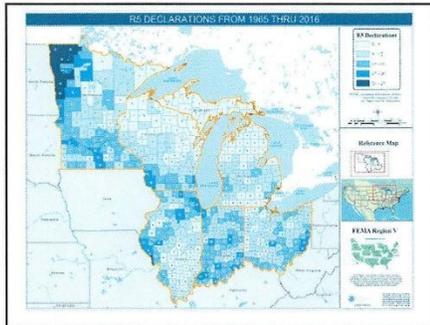
The Federal Emergency Management Agency (FEMA) provides grant funding to help communities to implement eligible mitigation projects that will help to reduce or eliminate the impact of future hazard or disaster events.



*Not all mitigation actions are eligible for federal HMA funding. Identification of eligible projects for potential HMA funding is a critical part of the MHMP planning process!*

### HMA Grant Funding Sources

- **Disaster**
  - Hazard Mitigation Grant Program (HMGP)
  - 15% of Public Assistance \$
    - EXAMPLE: DR-4069
    - PA: \$45 million
    - HMGP: \$6.75 million
- **Non-Disaster**
  - Pre-Disaster Mitigation- Competitive (PDM)
  - Annually congressionally appropriated



10/26/2016

### Mitigation Grant Eligibility

- Local Units of Government
- All jurisdictions in State
  - City, County, Tribal, private non-profit
- Cost Share - 75%/25%
- **Project must be identified in local HM plan**

### Application Process

- Notice of Available Funds
- Application
- Benefit Cost Analysis
- Environmental Historic Preservation
- State and FEMA review
- Award ~ 3 year period of performance
- Closeout

### Eligible project types

- **Acquisition/Elevation/Relocation**
  - Substantially or repetitively damaged (flood or erosion)
  - Threat of imminent danger (slope failure)
- **Tornado Safe Rooms** (severe storms/tornadoes)
- **Powerline retrofit/strengthening** (severe storms/ice)
- **Wildfire sprinklers/defensible space/resistant materials**
- **Slope stabilization**
- **Flood risk reduction activities**

### New! Climate Resilient Mitigation Actions (CRMA)

FEMA encourages communities to incorporate **climate resilience** in all mitigation actions through use of **green infrastructure methods** and designing projects to increase **ecosystem service benefits**

1. Aquifer Storage and Recovery (ASR)
2. Floodwater Diversion, Storage, and Recovery
3. Floodplain and Stream Restoration

### For more information (HSEM)

Jennifer Nelson                      James McClosky  
• State Hazard Mitigation      • Mitigation planner  
  Officer (SHMO)                      • 651-201-7455  
• 651-201-7427                      [James.McClosky@state.mn.us](mailto:James.McClosky@state.mn.us)  
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Or  
[hazard.mitigation@state.mn.us](mailto:hazard.mitigation@state.mn.us)

# Mitigation Strategies

For every community, there are a range of mitigation actions that can be taken to work to reduce or eliminate the impacts of future natural hazard and disaster events. Following are the four types of mitigation strategies recommended by the Federal Emergency Management Agency (FEMA) for the organization of mitigation actions:

- 1) **Local Planning and Regulations:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- 2) **Structure and Infrastructure Projects:** Actions that involve the construction of structures to reduce the impact of a hazard, such as dams, levees, floodwalls, seawalls, retaining walls, and safe rooms; and actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass. CRMA include flood diversion and storage (FDS) and green infrastructure.
- 3) **Natural Systems Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation. Aquifer storage and recovery (ASR) and floodplain and stream restoration (FSR).
- 4) **Education and Awareness Programs:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

*A fifth strategy was added by Minnesota HSEM for use in the state:*

- 5) **Mitigation Preparedness and Response Support:** Actions that protect people and property prior to, during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.. These activities are typically not considered mitigation, but support reduction of the effects of damaging events.

## MITIGATION ACTIONS WORKSHEET

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

HAZARD: \_\_\_\_\_ / JURISDICTION: \_\_\_\_\_

**Mitigation Strategy:**

- |                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Local Planning & Regulations          | <input type="checkbox"/> Education and Awareness                      |
| <input type="checkbox"/> Structure and Infrastructure Projects | <input type="checkbox"/> Mitigation Preparedness and Response Support |
| <input type="checkbox"/> Natural Systems Protection            |                                                                       |

**Mitigation Action:**

Olmsted County  
10-24-16 MHMP Planning Meeting  
**Mitigation Ideas Worksheet Notes**



Following are notes from the Olmsted County 10-24-16 MHMP Planning Team Meeting “Mitigation Action Working Session” part of the meeting. Participants broke into discussion groups and used Mitigation Action Worksheets to brainstorm new mitigation ideas for their jurisdiction. Participants used the worksheets to develop mitigation action ideas, identifying:

- Hazard – what natural hazard does the action focus on?
- Jurisdiction – what jurisdiction is for? (City/Township/County)
- Strategy –which mitigation strategy does this action relate to?
- Action – what is a description of the mitigation action?

The mitigation actions identified during this session will be used for development of new mitigation actions to include in the Olmsted County MHMP 2016 Update.

**City of Byron**

Contact: Mary Blair Hoeft, 507-775-3418

Hazard: Flood  
 Strategy: Local Planning and Regulations  
 Action: Remove sediment from storm water ponds to prevent overflow.

Hazard: Flooding/Stormwater  
 Strategy: Education and Awareness  
 Action: Teach homeowners about drainage of stormwater, easements in their yard, elevation knowledge, pond maintenance.

Hazard: Loss of Power  
 Strategy: Mitigation Preparedness and Response Support  
 Action: Byron has dual power. ½ is in Excel and ½ is in People’s Energy. Need generators to make sure building is available to provide heat and continue services or EOC.

Hazard: Severe Winter/Summer Storms  
 Strategy: Local Planning & Regulations  
 Action: Capital improvement funding to plan for or fund an emergency manager to mitigate hazards.

**City of Chatfield**

Contact: Joel Young, [jyoung@ci.chatfield.mn.us](mailto:jyoung@ci.chatfield.mn.us), Brian Burkholder, [bburkholder@ci.chatfield.mn.us](mailto:bburkholder@ci.chatfield.mn.us)

Hazard: Flooding/Storm water  
Strategy: Natural Systems Protection  
Action: Pond structures above / Restore banks / Erosion / Mill Creek, Root River / County 10 Stormwater/holding ponds. (\*Split counties) Hillside Drive

Hazard: Power loss from storm  
Strategy: Mitigation Preparedness and Response Support  
Action: Generators (Firehall, Booster station, wells)

**City of Dover**

Contact: Jeremy Magnuson, 507-202-2556, [doverfirejeremy@yahoo.com](mailto:doverfirejeremy@yahoo.com)

Hazard: Flooding/Stormwater Management  
Strategy: Local Planning & Regulations / Education and Awareness  
Action: Increase awareness of citizens of building codes and easements

Hazard: Flooding/Stormwater Management  
Strategy: Structure and Infrastructure Project  
Action: Complete 142 project & retention pond one corner completion

Hazard: Winter Storm  
Strategy: Local Planning & Regulations  
Action: Storm Ready Community Certification  
Parking regulations/enforcement.  
Social media/website notifications.

**City of Eyota**

Contact: Marlis Knowlton, City Clerk, 507-545-2135, [mknowlton@cityofeyota.com](mailto:mknowlton@cityofeyota.com)

Hazard: Stormwater Pond  
Strategy: Structure and Infrastructure Projects  
Action: Need to keep ponds cleaned out for maximum benefit.

Hazard: Stormwater Runoff  
Strategy: Local Planning & Regulations  
Action: In neighborhoods, elevations of houses and grading of lots. During initial subdivision construction and later on, how do folks landscape their yards affecting entire neighborhood drainage. How to regulate zoning – building permits applications approval.

Hazard: Stormwater Runoff and Ground Water Levels  
Strategy: Education and Awareness  
Action: Teach people to be aware of how they grade their yards. And to have a working sump pump.

Hazard: Power Loss  
Strategy: Mitigation Preparedness and Response Support  
Action: Need generators. (buildings are wired)

**City of Oronoco**

Contact: Sandy Jessen, [Oronococity@gmail.com](mailto:Oronococity@gmail.com)

Hazard: Retention Ponds (City or HAS)  
Strategy: Natural Systems Protection  
Action: Regulation on cleanout. Our city requires HSA management.

Hazard: Stormwater Runoff  
Strategy: Local Planning & Regulations / Natural Systems Protection  
Action: Residential landscaping regulation

Hazard: Electric Outage  
Strategy: Mitigation Preparedness and Response Support  
Action: Generators. Funding needed (\$50,000 - \$100,000)

**City of Stewartville**

Contact: Bill Schimmel, 507-533-4745, [bschimmel@stewartvillemn.com](mailto:bschimmel@stewartvillemn.com)

Hazard: Flooding - River  
Strategy: Local Planning & Regulations / Structure and Infrastructure Projects  
Action: Elevation and landscaping of buildings

Hazard: Flooding – Storm Sewers  
Strategy: (nothing noted)  
Action: (nothing noted)

Hazard: Civil Defense Siren  
Strategy: Mitigation Preparedness & Response Support  
Action: (nothing noted)

Hazard: Power Loss  
Strategy: Mitigation Preparedness & Response Support  
Action: Generators

Hazard: Winter Storm  
Strategy: (nothing noted)  
Action: (nothing noted)

**City of Pine Island**

*Contact: Wayne King - Note: I am very interested in the HMA grant. Pine Island has 2 rivers that run through it and flood often. Purchasing land and building holding ponds is a necessity.*

Hazard: Flooding  
Strategy: Local Planning & Regulations / Structure and Infrastructure Projects  
Action: Planning and Zoning  
Local floodplain zones  
Retention ponds  
Reservoirs  
Rain/river monitoring  
Farm runoff/erosion  
Sand bagging supplies  
Storm sewers

Hazard: Power Outages  
Strategy: Mitigation Preparedness and Response Support / Education and Awareness  
Action: Generators for key places. Educate citizens.

Hazard: Severe Summer Storms/Civil Defense  
Strategy: Mitigation Preparedness and Response Support  
Action: Warning Sirens – make sure enough coverage. Developers cover cost.

**Olmsted County (Public Health)**

*Contact: Amy Evans, Olmsted County Public Health, [evans.amy@co.olmsted.mn.us](mailto:evans.amy@co.olmsted.mn.us)*

Hazard: All Hazards  
Strategy: Local Planning & Regulations  
Action: Planning – more mapping for ID of vulnerable populations; building relationships to maintain the data beyond census.

Hazard: All Hazards  
Strategy: Education and Awareness  
Action: Education to hospitality industry and visitors from outside the area (e.g., other counties)

Hazard: Extreme Heat / Extreme Cold  
Strategy: Education and Awareness  
Action: Education to vulnerable populations regarding resources during extreme heat/cold events.

**Olmsted County (SWCD)**

*Contact: Skip Langer, Olmsted SWCD, 507-328-7130*

Hazard: Flooding  
Strategy: Natural Systems Protection  
Action: Use existing plans i.e., South Zumbro CIP to guide the planning process

Hazard: Flooding (transportation)  
 Strategy: Structure and Infrastructure Projects  
 Action: Raising road grades/culvert modification to provide additional flood storage options. Need for easements on private land for storage. Issues with prolonging flood duration in cropland areas.

Hazard: Power (related to various power entities)  
 Strategy: Structure and Infrastructure Projects  
 Action: SW Olmsted Area: Issues with icing on lines. Want to move lines from overhead to underground. Coordinate with Public Works to avoid areas affected by flooding/road washouts. Also supply backup/redundant power affected by natural events like flooding, large storms, blizzards & ice.

Hazard: All-Hazards (for Public Works/Power providers)  
 Strategy: Education and Awareness  
 Action: Education campaigns for public like:  
 “Turn Around, Don’t Drown”  
 “Stay Away from Downed Power Lines”  
 “Personal Preparedness Campaign” (general)

Hazard: All-Hazards (for Public Works/Emergency Management)  
 Strategy: Local Planning & Regulations  
 Action: GIS locations of critical areas that have issues/concerns during high water conditions. i.e., culvert crossings that flood or low landscape areas where water accumulates.

Hazard: Flooding (for Public Works/SWCD)  
 Strategy: Natural Systems Protection  
 Action: Funding for flood storage in the landscape that can help slow the flow and reduce peak flows over time, help to minimize flood events. Install flood warning gauges on streams in critical areas for the county.

**Olmsted County (Environmental Resources)**

Contact: John Helmers, 507-328-7017, [helmers.john.co.olmsted.mn.us](mailto:helmers.john.co.olmsted.mn.us)

Hazard: Riverine Flooding  
 Strategy: Natural Systems Protection  
 Action: Habitat restoration to provide temporary storage within the river corridor.

Hazard: Riverine Flooding  
 Strategy: Education and Awareness  
 Action: Non-public waters – protection of natural systems by raising awareness that all waters are connected and should be protected from unnecessary human impacts.

Hazard: Riverine Flooding  
 Strategy: Mitigation Preparedness and Response Support  
 Action: Stream gauges which are remotely read and integrated in advance warning systems and education programs.

**Olmsted County Townships**

Contact: Ann Fahy-Gust - New Haven Township, [nhtownship@bevcomm.net](mailto:nhtownship@bevcomm.net)

Gerri Ihrke -Quincy Township, [g410@live.com](mailto:g410@live.com)

Drew Miessner@[yahoo.com](mailto:yahoo.com)

Dano O'Neill - Eyota Township, [llienonad@gmail.com](mailto:llienonad@gmail.com)

Brenda Lindquist - Rock Dell Township, [lonnchalmers@kmtel.com](mailto:lonnchalmers@kmtel.com)

Dale Wagner - Orion Township, [dalefarmer49@gmail.com](mailto:dalefarmer49@gmail.com)

Roger Bjerke - Marion Township, [rbjerke0732@yahoo.com](mailto:rbjerke0732@yahoo.com)

Nathan Redalen, [redalen61@msn.com](mailto:redalen61@msn.com)

Roger Richardson, [Richardson.roger@mayo.edu](mailto:Richardson.roger@mayo.edu)

Hazard: Flood/Severe Storm  
Strategy: Education and Awareness  
Action: Put youtube video "Are You Ready?" on our websites

Hazard: Flood/Severe Storm  
Strategy: Local Planning & Regulations / Education and Awareness  
Action: Would like more direct training on cleaning creek ditches. People don't know what their responsibility is in rural areas. New video? Training program? Also driveways and culvert permitting.

**Olmsted County Multi-Hazard Mitigation Plan Update  
MHMP Planning Team Meeting #2  
2/23/17 Olmsted County EOC, 10:00 a.m. – 12:00 p.m.**

**Meeting Summary:**

On Thursday, February 23, 2017 members of the Olmsted County Multi-Hazard Mitigation (MHMP) Planning Team convened to conduct a review and discussion of the draft mitigation action charts developed for Olmsted County and the city jurisdictions participating in the plan. The meeting was facilitated by Bonnie Hundrieser, a member of the University of Minnesota – Duluth Geospatial Analysis Center (GAC) planning team that is leading the update of the Olmsted County MHMP. A total of 14 people attended the meeting, representing Olmsted County departments and city personnel.

The opening Power Point presentation covered a re-cap of key points regarding the MHMP plan update (purpose of the plan, who the plan covers, who needs to participate, what hazards are addressed and how they are ranked, mitigation strategies to be used, and what projects may be eligible for FEMA HMA funding). The presentation also provided a detailed breakdown of the Mitigation Action Chart to explain the relevance of each column to be addressed in the chart.

Following the presentation, the planning team participated in a facilitated discussion of the County's draft master Mitigation Action Chart which included mitigation actions for the county as well as for the cities participating in the plan. Mitigation actions included in the chart were identified through the County's review of past mitigation actions (actions to continue), as well as new mitigation actions that were identified during the first planning team meeting "Mitigation Actions Ideas Working Session." County and city representatives discussed each of the mitigation actions, adding comments, corrections, and identifying where cities would be listed to implement particular items in their respective jurisdictions.

Following the Mitigation Action Chart review, the group was informed that they would be emailed drafts of the mitigation action charts for county and city level review and input. The group also discussed the upcoming process of posting the final draft of the plan for the public to review and comment on, and then submission of the draft plan to HSEM and FEMA for final review and approval.

**Attached to this meeting summary are the following documentation items:**

- Olmsted County HMP Mtg. #2 Email Invite
- 2-23-17 Meeting Agenda
- 2-23-17 Meeting Sign-in Sheets
- 2-23-17 Power Point Presentation Slides

*Meeting Summary Prepared By:  
Bonnie Hundrieser, UMD Project Team, (Hundrieser Consulting LLC)*

**From:** Ridd Michelle  
**Sent:** Friday, February 03, 2017 2:43 PM  
**To:** City Administrator - Byron ([mhoeft@ci.byron.mn.us](mailto:mhoeft@ci.byron.mn.us)) <[mhoeft@ci.byron.mn.us](mailto:mhoeft@ci.byron.mn.us)>; City Administrator - Stewartville ([bschimmel@stewartville.mn.com](mailto:bschimmel@stewartville.mn.com)) <[bschimmel@stewartville.mn.com](mailto:bschimmel@stewartville.mn.com)>; Sheehan Michael <[sheehan.michael@CO.OLMSTED.MN.US](mailto:sheehan.michael@CO.OLMSTED.MN.US)>; Langer Skip <[Langer.skip@CO.OLMSTED.MN.US](mailto:Langer.skip@CO.OLMSTED.MN.US)>; Evans Amy <[evans.amy@co.olmsted.mn.us](mailto:evans.amy@co.olmsted.mn.us)>; Goslee Sandra <[goslee.sandi@CO.OLMSTED.MN.US](mailto:goslee.sandi@CO.OLMSTED.MN.US)>; Helmers John <[helmers.john@CO.OLMSTED.MN.US](mailto:helmers.john@CO.OLMSTED.MN.US)>; Hackman Julie <[hackman.julie@CO.OLMSTED.MN.US](mailto:hackman.julie@CO.OLMSTED.MN.US)>; Struckmann Sue <[struckmann.susan@CO.OLMSTED.MN.US](mailto:struckmann.susan@CO.OLMSTED.MN.US)>; Chezick Janice <[chezick.janice@CO.OLMSTED.MN.US](mailto:chezick.janice@CO.OLMSTED.MN.US)>; Welsch Heidi <[welsch.heidi@CO.OLMSTED.MN.US](mailto:welsch.heidi@CO.OLMSTED.MN.US)>; Larsen Martin <[larsen.martin@CO.OLMSTED.MN.US](mailto:larsen.martin@CO.OLMSTED.MN.US)>; Schuman Chad <[schuman.chad@CO.OLMSTED.MN.US](mailto:schuman.chad@CO.OLMSTED.MN.US)>; 'Jeremy Magnuson' <[doverfirejeremy@yahoo.com](mailto:doverfirejeremy@yahoo.com)>; - Oronoco ([oronocomaint@pitel.net](mailto:oronocomaint@pitel.net)) <[oronocomaint@pitel.net](mailto:oronocomaint@pitel.net)>; 'Gary Fitterer' <[gfitterer@peoplesrec.com](mailto:gfitterer@peoplesrec.com)>; 'bburkholder@ci.chatfield.mn.us' <[bburkholder@ci.chatfield.mn.us](mailto:bburkholder@ci.chatfield.mn.us)>; Marlis Knowlton ([mknowlton@cityofeyota.com](mailto:mknowlton@cityofeyota.com)) <[mknowlton@cityofeyota.com](mailto:mknowlton@cityofeyota.com)>; 'dpw@bevcomm.net' <[dpw@bevcomm.net](mailto:dpw@bevcomm.net)>  
**Cc:** Bromberg Mike <[bromberg.mike@CO.OLMSTED.MN.US](mailto:bromberg.mike@CO.OLMSTED.MN.US)>; Ridd Michelle <[ridd.michelle@co.olmsted.mn.us](mailto:ridd.michelle@co.olmsted.mn.us)>  
**Subject:** Olmsted County HMP Planning Team Meeting #2 Invitation

Greetings,

Your presence is requested at the 2<sup>nd</sup> **Planning Team meeting** for the update of the **Olmsted County Multi-Hazard Mitigation Plan** on:

**Date: Thursday, February 23**  
**Time: 10:00 a.m. – 12:00 p.m.**  
**Location: Olmsted County EOC (1421 3<sup>rd</sup> Ave SE, Rochester MN, 55904)**

During this meeting we will be reviewing the draft mitigation action chart to be included in the plan. Your feedback will be needed to identify & discuss the mitigation actions that will be listed for your city/county department/agency/or organization. This is a State and Federal requirement we must cover for the plan to be approved.

The meeting will be facilitated by Bonnie Hundrieser, an emergency management planning consultant working closely with us on this project. Bonnie will send me the draft mitigation chart(s) to email out for your review prior to the meeting.

**Please RSVP your attendance to me via reply to this email.** If you cannot attend, please seek to send someone else in your stead as your representation at this meeting is important.

If you have any questions, please do not hesitate to contact me.

Thank you,

Michelle Ridd  
Office Manager  
Olmsted County Sheriff's Office  
Office of Emergency Management  
(507) 328-6105



# Olmsted County Multi-Hazard Mitigation Plan (MHMP) Update

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## Planning Team Meeting #2

Thursday, February 23<sup>rd</sup>, 10:00 a.m – 12:00 p.m.  
Olmsted County EOC - Rochester, MN

**Presenting:**

Bonnie Hundrieser, UMD MHMP Project Team Member

**Agenda:**

1. **Welcome & Introductions**
2. **MHMP - Recap of Key Points**
3. **Mitigation Action Chart (MAC) Presentation**  
Explanation of all columns of the MAC and content to be identified.
4. **MAC Working Session: Group Review & Feedback**  
Group review and feedback of the Olmsted County Master Mitigation Action Chart. This will include identification of specific mitigation actions for jurisdictions / review and feedback of jurisdictional MAC's.
5. **Discussion of Next Steps**
  - Completion of all Mitigation Action Charts
  - Planning Team review of draft MHMP
  - Public news release, posting draft MHMP, and public meetings

**Contact:**

*For more information on the Olmsted County MHMP Update, please contact:*

- Mike Bromberg, Olmsted County Emergency Management Director  
507-272-4506 / [bromberg.mike@CO.OLMSTED.MN.US](mailto:bromberg.mike@CO.OLMSTED.MN.US)
- Bonnie Hundrieser, UMD MHMP Project Team Member  
218-343-3468 / [hundrieserconsulting@gmail.com](mailto:hundrieserconsulting@gmail.com)

Olmsted County 2/23/17 Planning Team Meeting  
 Participant Sign-in List (14 attendees)

Olmsted County MHMP Update Planning Team Meeting #2, Thursday, February 23, 2017 10am-12pm Participant Sign-in List			
Name	Agency/Organization	Title	Email
Eric Counselman	City of Byron	Public Works Supervisor	<a href="mailto:ecounselman@byronmn.com">ecounselman@byronmn.com</a>
Wayne King	City of Pine Island	Street Supervisor /Emergency Manager	<a href="mailto:dpw@bevcomm.net">dpw@bevcomm.net</a>
Marlis Knowlton	City of Eyota	Clerk/Treasurer	<a href="mailto:mknowlton@cityofeyota.com">mknowlton@cityofeyota.com</a>
Bill Schimmel	City of Stewartville	City Administrator	<a href="mailto:bschimmel@stewartvillemn.com">bschimmel@stewartvillemn.com</a>
Mary Blair-Hoefl	City of Byron	City Administrator	<a href="mailto:mhoefl@byronmn.com">mhoefl@byronmn.com</a>
Ryan Priebe	City of Chatfield	Public Works/Fire Chief	<a href="mailto:rpriebe@ci.chatfield.mn.us">rpriebe@ci.chatfield.mn.us</a>
Amy Evans	Olmsted County Public Health	Emerg. Prep. Coord	<a href="mailto:evans.amy@co.olmsted.mn.us">evans.amy@co.olmsted.mn.us</a>
Katherine Mortenson	City of Rochester	Emergency Management Consultant	<a href="mailto:katherine.mortenson@outlook.com">katherine.mortenson@outlook.com</a>
Sandi Goslee	Rochester/Olmsted Planning	Principal Planner	<a href="mailto:goslee.sandi@co.olmsted.mn.us">goslee.sandi@co.olmsted.mn.us</a>
Heidi Welsch	Olmsted County Administration	Deputy Administrator	<a href="mailto:welsch.heidi@co.olmsted.mn.us">welsch.heidi@co.olmsted.mn.us</a>
Sue Struckmann	Olmsted County Public Works	Executive Assistant	<a href="mailto:struckmann.sue@co.olmsted.mn.us">struckmann.sue@co.olmsted.mn.us</a>
John Helmers	Olmsted County Environmental Resources	Director	<a href="mailto:helmers.john@co.olmsted.mn.us">helmers.john@co.olmsted.mn.us</a>
Mike Bromberg	Olmsted County Emergency Management	Director	<a href="mailto:bromberg.mike@co.olmsted.mn.us">bromberg.mike@co.olmsted.mn.us</a>
Michelle Ridd	Olmsted County Emergency Management	Office Manager	<a href="mailto:ridd.michelle@co.olmsted.mn.us">ridd.michelle@co.olmsted.mn.us</a>

Olmsted County – Multi Hazard Mitigation Plan Update  
 Planning Team Meeting #2  
 Thursday, February 23, 2017, 10:00 a.m. – 12:00 p.m.

**PARTICIPANT SIGN IN SHEET**

Name	Agency/Organization	Title	Email
1. Eric Cunniffman	City of Byron	Public Works Supt	ecunniffman@byronmn.com
2. Wayne King	City of Pine Island	Street Supervisor Emergency Manager	dkw@bcvcom.net
3. Marli's Knowlton	City of Eyota	Clerk Treasurer	mknowlton@cityofeyota.com
4. Bill Scaramella	City of Stewartville	City Admin	bscaramella@stewartvillemn.com
5. Mary Bluestadt	City of Byron	City Administrator	mbluestad@byronmn.com
6. Ryan Price	City of Outfield	Public Works/Fire Chief	RPrice@ci.outfield.mn.us
7. Amy Evans	Dimsted Co. Public Health	Emergency Prep. Coordinator	evans.amy@co.dimsted.mn.us
8. Katherine Mortenson	City of Rochester	Emergency Management Consultant	katherine.mortenson@outlook.com
9. Sandi Goslee	Rochester-Dimsted Planning	Principal Planner	goslee.sandi@co.olmsted.mn.us
10. Heidi Wiegeln	Olmsted Co. Administration	Deputy Administrator	wiegeln.heidi@co.olmsted.mn.us
11. Sue Struckmann	Olmsted Co. Public Works	Executive Assistant	Struckmann.sue@co.dimsted.mn.us
12. John Helmers	Olmsted Co. Env. Resources	Director	helmerts.john@co.olmsted.mn.us
13. Mike Bromberg	Olmsted Co. EM	Director	Bromberg.mike@co.Olmsted.MN.US
14. Nichelle Zild	Olmsted County Health	Area Manager	nichellezild@olmsted.mn.us
15.			
16.			
17.			
18.			

## Olmsted County Multi-Hazard Mitigation Plan Update

Thursday, February 23, 2017  
**Planning Meeting #2: Mitigation Action Chart Review**



### Agenda

1. Welcome and Introductions
2. MHMP – Recap of Key Points
3. Mitigation Action Chart (MAC) Overview
4. MAC Working Session
5. Overview of Next Steps

### MHMP - Recap of Key Points

- Olmsted County is updating its **Multi-Hazard Mitigation Plan (MHMP)** to fulfill a state & federal requirement. The plan must be updated every 5 years.
- The purpose of the plan is to identify & assess natural hazards that pose risk to the County and it's jurisdictions and **develop long-term strategies and mitigation actions** that will help to reduce or eliminate the impact of future hazard or disaster events.

### *Who the Plan Covers*



- This is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville.
- Townships are covered under the County.
- The City of Rochester is not included, as it has its own Multi-Hazard Mitigation Plan.

### *Who Needs to Participate*

Participation of **key county/city stakeholders** is required:

- County departments
- City Governments
- Townships
- Schools
- Electric Coops

Opportunities for **public participation** is also required:

- News Releases
- Facebook, Twitter, Web
- Draft Plan Review
- 2 Public Meetings

### *What Hazards are Addressed*

The MHMP addresses the prioritized natural hazards that pose risk to Olmsted County.

Priorities of Risks Faced by Olmsted County	
Type	Risk Severity
Fresh Flood & Riverine Flood	High
Severe Winter Storms	High
Severe Summer Storms (thunderstorms, lightning, hailstorms, windstorms, tornadoes)	Moderate
Extreme Heat & Extreme Cold	Moderate
Erosion / Land Subsidence (sinkholes & karst)	Moderate
Drought	Low
Dam Failure	Low
Wildfire	Low

4/5/2017

### What Mitigation Strategies Will Be Used to Develop Mitigation Actions

1. Local Planning & Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

These strategies help communities to identify and implement **long-term risk-reduction activities** that will protect people and property from future hazard events.

### What Projects May be Eligible for FEMA HMA Funding

- Acquisition/Elevation/Relocation
  - Substantially or repeatedly damaged (flood or erosion)
  - Threat of imminent danger (slope failure)
- Safe Room Construction/Retrofit
- Powerline strengthening/burying
- Wildfire Mitigation Activities
- Slope stabilization
- Flood risk reduction activities
- Additional Projects difficult to conduct a standard BCA



The Federal Emergency Management Agency (FEMA) provides grant funding to help communities to implement eligible mitigation projects that will help to reduce or eliminate the impact of future hazard or disaster events.

Projects must be indicated in the local mitigation plan.

### Mitigation Action Chart Overview

- The MHMP results in a "Mitigation Action Chart" that outlines the specific mitigation measures that the County and each jurisdiction will seek to implement over the course of the next 5 years.
- Mitigation actions are drawn from the previous plan, identified capability gaps and feedback from jurisdictions on mitigation measures important to their community.
- **Every city will have its own separate mitigation action chart.** School districts and townships (as a group) may also have separate charts.

### "Hazard" column

Hazard	Mitigation Strategy	Mitigation Action	Local	Private	State	Federal	Responsible	County/Community/Other Stakeholder	Priority Ranking
--------	---------------------	-------------------	-------	---------	-------	---------	-------------	------------------------------------	------------------

Each mitigation action **must** address a particular natural hazard.

"All-Hazard" mitigation actions relate to more than one type of natural hazard or may relate to other categories of technological and man-made threats/hazards.

### "Mitigation Strategy" column

Hazard	Mitigation Strategy	Mitigation Action	Local	Private	State	Federal	Responsible	County/Community/Other Stakeholder	Priority Ranking
--------	---------------------	-------------------	-------	---------	-------	---------	-------------	------------------------------------	------------------

Each mitigation action **must** identify which type(s) of mitigation strategies relate to the mitigation measure:

1. Local Planning & Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness Programs
5. Mitigation Preparedness and Response Support

### "Mitigation Action" column

Hazard	Mitigation Strategy	Mitigation Action	Local	Private	State	Federal	Responsible	County/Community/Other Stakeholder	Priority Ranking
--------	---------------------	-------------------	-------	---------	-------	---------	-------------	------------------------------------	------------------

Each mitigation action **must** include a description of what effort is to be implemented. Mitigation actions should be written to be clear, concise, and action-oriented (start with a verb). The action should seek help to reduce or eliminate long-term risk to life safety and property damage from future natural hazard events.

4/5/2017

### “Status” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Each mitigation action **must** include an indication of current status. They are:

- “In-Progress” – a defined mitigation project or effort that is currently underway.
- “On-going” – a mitigation project or effort that continues without end.
- “New” – a new mitigation project or effort identified to include in the new plan.

### “Priority Ranking” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Each mitigation action **must** be ranked as being of High, Moderate, or Low priority to help provide guidance in implementation. Priority rankings should be based on key considerations, such as:

- Known effectiveness of the mitigation measure.
- Local capability to implement the mitigation measure.
- Cost effectiveness of the mitigation measure. (Benefit vs. Cost)
- Longevity of the mitigation measure.
- Community support for the mitigation measure.
- Eligibility for federal grants (FEMA HMA Grant Program).

### “Timeline” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Each mitigation action **must** indicate a timeframe for implementation.

- For mitigation actions that are “In-Progress” or “New” a known timeframe may be identified (i.e., 2017-2018).
- Some mitigation actions may be identified to be implemented within the 5 year period of the MHMP (2017-2021).

### “Jurisdictions” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Important: During the MAC working session you will be asked to indicate where your jurisdiction should be included.

Each mitigation action **must** identify what jurisdictions will seek to implement that action.

- Some mitigation actions will be specific to only the County for implementation.
- Other mitigation actions are those that all cities (or only some cities) would agree are important to include in their own jurisdictions.
- Schools and townships may be identified as well.

### “Responsibility” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Each mitigation action **must** include a brief identification of what agency or department or specific personnel has lead responsibility to implement that project or effort, such as:

- “County/City Emergency Management”
- “Planning and Zoning Department”
- “County Highway Department”
- “SWCD in collaboration with MN DNR”
- “Public Works Department”

### “Comments on Planning Mechanisms for Implementation” column

#	Hazard Category	Mitigation Action	Status	Priority Ranking	Jurisdictions	Responsibility	Comments on Planning Mechanisms for Implementation	Priority Funding
---	-----------------	-------------------	--------	------------------	---------------	----------------	----------------------------------------------------	------------------

Each mitigation action **must** include a description of how the mitigation measure will be incorporated into existing or future planning or project efforts by the jurisdiction provided. For example:

- Reference related plans or programs that relate to the mitigation measure (such as comprehensive land use plans, Capital Improvement Programs, public outreach and education programs)
- Reference existing partnerships that relate to the mitigation measure (such as “This is a standing effort of the County/City emergency management program in partnership with Public Health.”)

4/5/2017

### “Possible Funding” column

Item	Mitigation Strategy	Mitigation Measure	Task	Priority	Cost	Responsible Agency	Estimated Cost	Other/Alternative Funding/Source of Information	Priority
------	---------------------	--------------------	------	----------	------	--------------------	----------------	-------------------------------------------------	----------



Each mitigation action **must** include identification of what possible funding will be used to implement the mitigation action:

- In most cases, “County/City” budget generally implies staff time to work on the mitigation measure or internal funding to purchase equipment, etc.
- When applicable, other funding such as outside grants, state or federal funding that may support the mitigation measure should be identified.
- It is particularly important to identify mitigation measures that may be eligible for FEMA/HMA grant funding.

### MAC Working Session

- We will go through the Master “MAC” together.
- Please be prepared to hand-in your copy indicating your jurisdictional “Sign-Up”.
- Please write your Name & Contact information at the top of your chart.
- Cities without a draft MAC still have the opportunity to identify mitigation measures specific to their community.

**Following this meeting I will send out the new draft jurisdictional mitigation charts for review and completion.**

### Overview of Next Steps

- Draft MACs will be submitted to UMD.
- The draft MHMP will be completed.
- The draft plan will be posted for planning team and public review & comment. (News Release)
- We will hold 2 public meetings in different parts of the county (on the same day).
- Any resulting revisions will be made, and the plan will be submitted to HSEM and FEMA for review and approval.

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# Appendix F

## Public Outreach & Engagement Documentation



Office of Emergency Management  
1421 3<sup>rd</sup> Ave SE  
Rochester Minnesota 55904  
Business Phone 507-328-6100  
FAX 507-328-6110  
Captain Mike Bromberg - Director

## OLMSTED COUNTY NEWS RELEASE

February 10, 2017

### **Public Feedback and Participation Invited for Olmsted County 2017 Multi-Hazard Mitigation Plan Update**

The Olmsted County Office of Emergency Management is currently working with the University of Minnesota Duluth – Geospatial Analysis Center (GAC) to prepare an update of the County’s “Multi-Hazard Mitigation Plan” (MHMP). The plan is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000) and must be updated every five years in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.

Development of the plan is under direction of the County’s Emergency Manager in cooperation with a planning team of representatives from County departments, local municipalities (city and township), school districts, and other key stakeholders such as utility providers. The planning team is responsible to provide feedback required for the plan update, including the ranking of hazards and identification of strategic, cost-effective mitigation activities that may reduce future losses for the County and individual jurisdictions. Some mitigation activities may be eligible for future FEMA Hazard Mitigation Assistance (HMA) grant funding, such as: localized flood reduction measures, property acquisition and relocation/conversion to open space, infrastructure retrofits, wildfire mitigation, and safe room construction or retrofits to provide immediate life-safety protection for people vulnerable to tornado and severe wind events.

#### **About the Plan**

The Olmsted County MHMP is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville. The Olmsted County MHMP also incorporates the concerns and needs of townships, school districts, and other stakeholders participating in the plan.

Olmsted County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. Hazards such as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms, and droughts have the potential for inflicting vast economic loss and personal hardship.

According to Olmsted County Emergency Management Director, Captain Mike Bromberg, “Hazard mitigation planning is a central part of our emergency management program. Understanding the natural hazards that can cause serious impact to our communities and taking

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action to reduce or eliminate the impact of future disasters makes us more resilient. Hazard mitigation helps us to break the cycle of damage and repair caused by things like flooding, ice storms, and severe wind events that can damage property, stress economies, and threaten life safety in our county.”

Examples of hazard mitigation include actions such as improvement of roads and culverts that experience repetitive flooding; construction of safe rooms at campgrounds, parks, trailer parks or schools to protect lives in the event of tornados or severe wind events; burying powerlines that may fail due to heavy snow, ice or wind storms; ensuring timely emergency communication to the public through warning sirens and mass notification systems, and conducting public awareness and education campaigns to help people to be prepared to take safe action before, during, or following a hazard event.

**Public Feedback and Participation is Encouraged**

As part of the planning process, gathering input from the public is an important and required step. Olmsted County seeks to gather feedback from residents and businesses from across the County to incorporate into the plan:

- What are the natural hazards you feel pose the greatest risk to your community?
- Have you experienced a previous disaster event?
- What concerns do you have, and what sorts of mitigation actions or projects do you feel would help to reduce the damages of potential future events for your personal property, your community, or the County as a whole?

The public is strongly encouraged to submit your comments, concerns, or questions regarding natural disasters and potential mitigation actions to be included into the plan update process. Please submit your feedback to Olmsted County Emergency Manager, Mike Bromberg: (507) 328-6101 or [Bromberg.mike@co.olmsted.mn.us](mailto:Bromberg.mike@co.olmsted.mn.us).

The public will have a continued opportunity to participate in the MHMP update in the coming months. A draft of the plan will be posted on the County website for public review, which will be followed by two public meetings held within different parts of the county. Future news releases will be shared with the media to notify the public of these opportunities.



### Olmsted County Emergency Management

Published by Mike Bromberg [?] · 1 hr · ✨

**OLMSTED COUNTY NEWS RELEASE**  
February 10, 2017

Public Feedback and Participation Invited for  
Olmsted County 2017 Multi-Hazard Mitigation Plan Update...  
[Continue Reading](#)

471 people reached Boosted for \$100.00

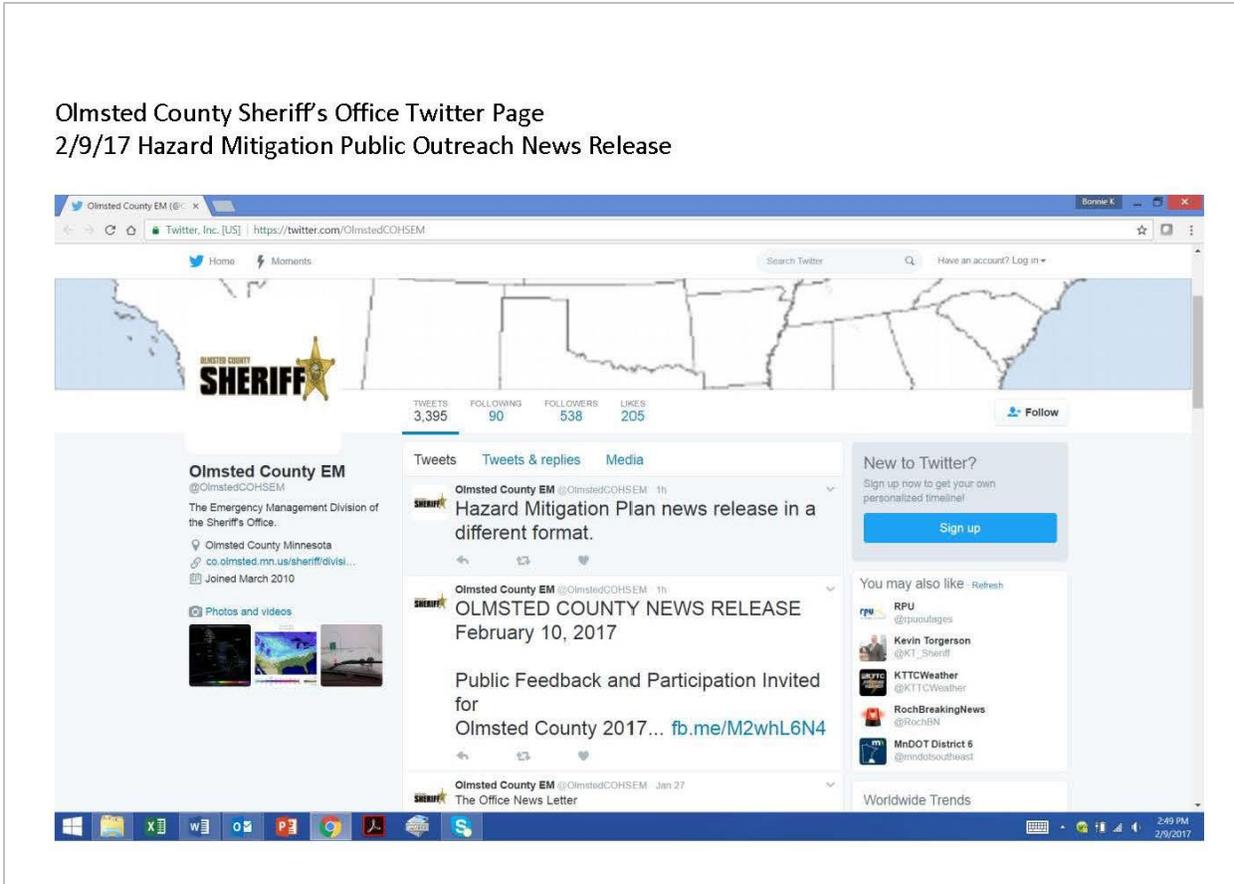
[Like](#) [Comment](#) [Share](#)

 Olmsted County Emergency Management and Chelsey Betty Marie Bedtke

 Write a comment...  

[See All](#)

Olmsted County Sheriff's Office Twitter Page  
2/9/17 Hazard Mitigation Public Outreach News Release



City of Chatfield news release posting



# Chatfield, Minnesota

*"The Chosen Valley"*






**Home**

- About Chatfield
- Agenda and Minutes
- Applications & Forms
- Bluff County Hiking Club
- Brush & Leaf Dump
- Bus Schedule
- Business Directory
- CCTV
- Chatfield Center for the Arts
- Chatfield Public Library
- Chatfield Public Schools
- Chosen Valley Community Foundation
- Code of Ordinances
- Comp Plan 2015
- Financial Reports
- Frequently Asked Questions
- Garbage & Recycling
- Jobs / Volunteering
- Links
- Haps & Plans
- New Resident Information
- Newsletter
- Online Payments
- Rochester City Lines

Entertainment & Recreation
Local Govt & Administration
Community
Contact Us

Municipal Offices - 21 SE Second Street, Chatfield, MN 55923 507.867.3810 (in case of emergency dial 911) Mon - Fri 8:00 a.m. - 4:30 p.m.

### Quick Links and Upcoming Events

Directories & Seasonal Resources - click on image to display





















Streaming Media - click on image to view videos















### Public Feedback - Hazard Mitigation

**Public Feedback and Participation is Encouraged**

As part of the planning process, gathering input from the public is an important and required step. Olmsted County seeks to gather feedback from residents and businesses from across the County to incorporate into the plan:

- What are the natural hazards you feel pose the greatest risk to your community?
- Have you experienced a previous disaster event?
- What concerns do you have, and what sorts of mitigation actions or projects do you feel would help to reduce the damages of potential future events for your personal property, your community, or the County as a whole?

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The public will have a continued opportunity to participate in the MHMP update in the coming months. A draft of the plan will be posted on the County website for public review, which will be followed by two public meetings held within different parts of the county. Future news releases will be shared with the media to notify the public of these opportunities.

Click on image to read News Release

### Skating Rinks



02/02/2017  
Figure Skating Rink is Open  
Hockey Skating Rink Open

### CCTV Slide Show



Updated 02/10 Click on image to view  
NOTE: Large video file may take several minutes to download

### Lifeguards



The City of Chatfield is taking applications for lifeguards for the 2017 pool season. Applicants must be 15 years of age by June 29, 2017. Lifeguard Certification classes will be available. Applications can be picked up at city hall, Chatfield High School Office, or can be printed by clicking on the following links  
[Life Guard Job Description](#)  
[Employment Application](#)  
Applications are due back by 4:00 p.m. on Wednesday, March 1, 2017.

### Energy Assistance



Office of Emergency Management  
1421 3<sup>rd</sup> Ave SE  
Rochester Minnesota 55904  
Business Phone 507-328-6100  
FAX 507-328-6110  
Captain Mike Bromberg - Director

## OLMSTED COUNTY NEWS RELEASE

May 23, 2017

### **Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan**

Olmsted County has completed an updated draft of the County's Multi-Hazard Mitigation Plan (MHMP) as required by the Federal Disaster Mitigation Act of 2000 (DMA 2000). Local jurisdictions are required to update the plan every five years to remain eligible for pre-disaster and post-disaster mitigation grant programs.

Community involvement and feedback are vital to the success of the plan. Olmsted County invites public review and feedback of the draft plan prior to submitting it to the State of Minnesota and the Federal Emergency Management Agency (FEMA) for review. A copy of the draft MHMP and a survey for public feedback is available online at <https://scse.d.umn.edu/olmsted-county-mhmp>. The plan review and comment period will be open until Friday, June 9, 2017.

#### **About the Plan**

The Olmsted County MHMP is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville. The Olmsted County MHMP also incorporates the concerns and needs of townships, school districts, and other stakeholders participating in the plan.

Olmsted County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. The plan addresses how to mitigate against hazards such as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms, and droughts which have the potential for inflicting vast economic loss and personal hardship.

Update of the plan has been under direction of Olmsted County Emergency Management in cooperation with the University of Minnesota Duluth – Geospatial Analysis Center and representatives from County departments, local municipalities (city and township), school districts, and other key stakeholders such as utility providers. Together, the planning team worked to identify cost-effective and sustainable actions to reduce or eliminate the long-term risk to human life or property from natural hazards. Some examples include improvement of roads and culverts that experience repetitive flooding; construction of safe rooms at campgrounds, public parks, mobile home parks or schools to protect lives in the event of tornados or severe wind events; burying powerlines that may fail due to heavy snow, ice or wind storms; ensuring

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timely emergency communication to the public through warning sirens and mass notification systems, and conducting public awareness and education campaigns to help people be prepared to take safe action before, during, or following a hazard event.

**The Benefits of Hazard Mitigation Planning**

Hazard mitigation planning ultimately helps us protect Olmsted County residents. By working with local communities we can identify vulnerabilities and develop strategies to reduce or eliminate the effects of a potential hazard. In addition, increasing public awareness of local hazards and disaster preparedness helps to create a community that is resilient to disaster, and breaks the cycle of response and recovery. Update of the plan will further allow the county and its jurisdictions to apply for eligible projects under future Hazard Mitigation Assistance (HMA) grant funding from FEMA for projects that are cost-effective and will help to reduce or eliminate impacts of future natural disaster events.

**Contact**

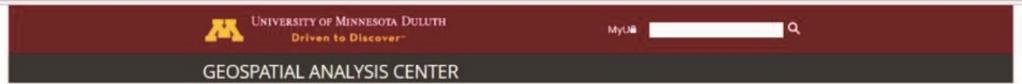
For questions on the Olmsted County MHMP please contact Captain Mike Bromberg, Olmsted County Emergency Management Director: Phone: 507-328-6101 or Email: [Bromberg.mike@co.olmsted.mn.us](mailto:Bromberg.mike@co.olmsted.mn.us).

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## Webpages for Public Feedback to Olmsted County MHMP Update

URL: <https://scse.d.umn.edu/olmsted-county-mhmp>

Home Page with Links to Olmsted County draft MHMP and Mitigation Action Charts



### Public Feedback for Olmsted County MHMP Update

UMD - Sorenson College of Science and Engineering - Public Feedback for Olmsted County MHMP Update

**Contact us**  
umdgis@d.umn.edu  
(218) 726-7438  
TTY/TDD:  
(800) 627-3529  
Kirby Plaza 389  
Duluth, MN 55812



Olmsted County is currently in the process of updating its Multi-Hazard Mitigation Plan. Before the plan is submitted to the State of Minnesota and FEMA for approval, we need your feedback! Please review the draft plan, in particular the mitigation actions for your jurisdiction, and then fill out this [quick form](#). Also check out this [story map](#) that documents the history of natural hazards in Olmsted County.

- [Olmsted County 2017 MHMP Draft](#)
- [Olmsted County Mitigation Actions](#)
- [Byron Mitigation Actions](#)
- [Chatfield Mitigation Actions](#)
- [Dover Mitigation Actions](#)
- [Evota Mitigation Actions](#)
- [Oronoco Mitigation Actions](#)
- [Pine Island Mitigation Actions](#)
- [Stewartville Mitigation Actions](#)
- [Public Schools Mitigation Actions](#)

Help us make Olmsted County safer from natural disasters!

Olmsted County MHMP - Online Comment Form

**Olmsted County MHMP Feedback & Comments**

Upon reviewing the draft 2017 Multi-Hazard Mitigation Plan for Olmsted County, please answer the following questions to provide feedback and suggestions. Thank you!

**Name**  
Your answer

**Email address**  
Your answer

**Job Title and Organization**  
Your answer

**Jurisdiction**  
Choose \*

After reviewing the mitigation actions for your jurisdiction, do you have any ideas for new ones to add? Please explain in as much detail as possible.  
Your answer

Are there any issues in your community related to natural hazards that we did not address in the plan? Please explain in as much detail as possible.  
Your answer

Does this plan reflect the needs of Olmsted County to mitigate against future natural hazards? If not, please explain.  
Your answer

Do you have any other comments or suggestions on the plan before it is submitted to the State of Minnesota and FEMA for approval?  
Your answer

How did you find out about this planning effort?

- Colleague
- Friend
- Olmsted County Facebook Page
- County Announcement/Flyer
- County Email
- Newspaper
- Other:

**SUBMIT**

Never submit passwords through Google Forms.

This form was created inside University of Minnesota Duluth. Report Abuse - Terms of Service - Additional Items

Google Forms

Olmsted County MHMP - Online Story Map

The screenshot shows a web browser window displaying an online story map. The browser's address bar shows the URL: <https://umr.maps.arcgis.com/apps/MapJournal/index.html?appid=b5f5a76ec9054f2af5bad13f6de1ddf>. The page title is "Olmsted County Natural Hazards".

**Olmsted County Natural Hazards**



Olmsted County is located in southeastern Minnesota, approximately 70 miles southeast of the Twin Cities. To the west lies Dodge County, and to the south are Mower and Fillmore Counties. Goodhue and Wabasha Counties are on the northern border of the county, and to the east is Winona County. Olmsted County covers 655 square miles (419,200 acres) and the county's estimated population in 2010 was 144,248. Rochester is the county seat and the largest city in the county.

**Demographics**

Population growth trends have an important influence on the needs and demands of a variety of services such as transportation, law enforcement, and emergency response. An understanding of population trends and location of population concentrations is important for making projections regarding potential impacts in the event of a disaster.

In 2010, Olmsted County had a population of 144,248 residents, averaging 220 persons per square mile of land area. Rochester, the largest city in the county and the county seat, had a population of 106,709.

Olmsted County's population is highly concentrated, growing 17% between 1990 and 2010, with corresponding increases from 2000 to 2010. [View the population map page 10-1200](#)

The map on the right shows the county boundary in blue, with major cities like Rochester, Shakopee, and Eden Prairie labeled. The map includes a search bar, zoom controls, and a scale bar.

The screenshot shows the Olmsted County Official Website. At the top left is the logo for the County of Olmsted, Minnesota. To the right are social media icons for Facebook and Twitter, and links for 'A-Z Guide', 'Subscribe', 'Jobs', 'Site Help', and 'Contact Us'. Below this is a navigation menu with 'HOME', 'YOUR GOVERNMENT', 'SERVICES', 'LIVING HERE', 'APPLY FOR', and 'I WANT TO...'. A tagline reads 'A dynamic world-class County delivering excellence every day'. A large search bar asks 'What are you looking for?' with a 'Search' button. Below the search bar is the breadcrumb 'Olmsted County Official Website > Olmsted County News'. On the left, there's a 'County Departments' button and a link 'Back to previous page'. The main content area features a headline: 'Olmsted County Wants Your Feedback - Multi-Hazard Mitigation Plan' dated 5/23/2017. To the right of the headline are utility buttons for 'Printer Friendly', 'Email This Page', 'Share It', and 'Translate', along with font size controls. Further right are promotional boxes for 'Need Help? Try our A-Z Guide' and a 'County Meeting Calendar' for January 7th. At the bottom right is the USA.gov logo.

The screenshot shows the Facebook page for the Olmsted County Sheriff's Office. The page header includes the name 'Olmsted County Sheriff's Office' and a search bar. The profile picture shows a sheriff in uniform. The page is set to 'Following' and has a 'Send Message' button. The main post, from 2 minutes ago, is titled 'Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan'. The text of the post states: 'Olmsted County has completed an updated draft of the of the County's Multi-Hazard Mitigation Plan (MHMP) as required by the Federal Disaster Mitigation Act of 2000 (DMA 2000). Local jurisdictions are required to update the plan every five years to remain eligible for pre-disaster and post-disaster mitigation grant programs. Community involvement and feedback are vital to the success of the... See More'. Below the text is a photo of a bridge over a river with a large log jammed against it. The post also includes a 'Public Feedback for Olmsted County MHMP Update' section with a link to a document. On the right side of the page, there is a map showing the location at 101 4th St SE, Rochester, Minnesota, MN 55904, with phone number (507) 328-6800 and website www.co.olmsted.mn.us/sheriff/Pages/default.asp. Below the map is a 'People Also Like' section listing 'Goodhue County Sheri...', 'Minneapolis Police Dep.', and 'Rochester/Olmsted Co...'. The right sidebar shows 'YOUR PAGES' and 'CONTACTS'.

The screenshot shows the Facebook page for 'Olmsted County Emergency Management'. The page header includes the name, a search bar, and navigation options like 'Home', 'Inbox', 'Notifications', 'Insights', and 'Publishing Tools'. The left sidebar contains navigation links: Home, About, Photos, Reviews, Likes, Events, Videos, Posts, and a 'Promote' button. The main content area features a 'Reach People Close By' advertisement, a post from Mike Bromberg titled 'Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan', and a 'Public Feedback for Olmsted County MHMP Update' section. The right sidebar displays engagement statistics (likes, follows, reach), a 'Community' section, and lists of 'YOUR PAGES' and 'CONTACTS'.

**Olmsted County Emergency Management**  
Create Page @Username

**Reach People Close By**  
You could reach up to 71,000 people on Facebook who are within 2 miles of your business location.  
[Promote Local Business](#)

**Olmsted County Emergency Management**  
Published by Mike Bromberg [?] · 1 min ·

**Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan**  
Olmsted County has completed an updated draft of the of the County's Multi-Hazard Mitigation Plan (MHMP) as required by the Federal Disaster Mitigation Act of 2000 (DMA 2000). Local jurisdictions are required to update the plan every five years to remain eligible for pre-disaster and post-disaster mitigation grant programs. ... See More

**Public Feedback for Olmsted County MHMP Update**  
Olmsted County is currently in the process of updating its Multi-Hazard Mitigation Plan. Before the plan is submitted to the State of Minnesota and FEMA for approval, we need your feedback! Please review the draft plan, in particular the mitigation actions for your jurisdiction, and then fill out th...  
SCSE.D.UMN.EDU

**Community**  
Invite your friends to like this Page  
4,866 people like this  
4,816 people follow this  
27 people have visited  
Nathan Timm and 225 other friends like this or have visited

**YOUR PAGES**  
SEE ALL  
Olmsted County Emer...  
Lake Edward Trailer P...  
Elect Incumbent Judge Ka...

**CONTACTS**  
Mark Thein 12m  
Tracy McCray 1h  
Brady Rollie 1m  
Nathan Bale 1m  
Laurissa Bale 31m  
Lisa Lovering 34m

Email Bulletin sent to Subscribers of Keeping Olmsted County Safe, News Articles, or Sheriff's Office, (755 recipients)

Having trouble viewing this email? [View it as a Web page.](#)

olmsted county



## County's Multi-Hazard Mitigation Plan

storm



Olmsted County has completed an updated draft of the of the County's Multi-Hazard Mitigation Plan (MHMP) as required by the Federal Disaster Mitigation Act of 2000 (DMA 2000). Local jurisdictions are required to update the plan every five years to remain eligible for pre-disaster and post-disaster mitigation grant programs.

Community involvement and feedback are vital to the success of the plan. Olmsted County invites public review and feedback of the draft plan prior to submitting it to the State of Minnesota and the Federal Emergency Management Agency (FEMA) for review. A copy of the draft MHMP and a survey for public feedback is available online at <https://scse.d.umn.edu/olmsted-county-mhmp>. The plan review and comment period will be open until Friday, June 9, 2017.

[Read More](#)



### Contact

For questions on the Olmsted County MHMP please contact Captain Mike Bromberg, Olmsted County Emergency Management Director: Phone: 507 272-4506  or Email: [Bromberg.mike@co.olmsted.mn.us](mailto:Bromberg.mike@co.olmsted.mn.us).

WHERE NEIGHBORHOODS BECOME FAMILY. WELCOME HOME!

# BYRON

Minnesota

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**Home**



**Economic Development**



**City Code**



**City Information**



**City Departments**



**City Government**



**City Projects**



**Sesquicentennial - 150 Years**



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**PAY YOUR BILL**

[Employment](#)

[Byron Comprehensive Plan](#)

[Emergency Alert](#)

[Photo Credits](#)

[Resident Move in/Move Out](#)

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**Contact City Hall**

680 Byron Main Ct. NE  
Byron, MN 55920

Phone: 507-775-3400  
Fax: 507-775-3401

City Hall [email](#)

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Join Us On  **facebook**

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**Byron Good Neighbor Days**

### Byron is Glad you are Here!

The City of Byron is a flourishing community that provides the groundwork for vigorous neighborhoods and thriving businesses. We invest in high quality and proficient services, effective partnerships and citizen participation. Byron's commitment to a well planned development enhances the distinctive and high quality of life enjoyed by our residents. We also offer the benefit of living near Rochester while providing a family-friendly small town atmosphere.

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### Olmsted County News Release

Please click [here](#) to see the public notice for the Olmsted County's Multi-Hazard Mitigation Plan. For more information, you can contact Olmsted County MHMP, Mike Bromberg at 507-328-6101 or email him at [bromberg.mike@co.olmsted.mn.us](mailto:bromberg.mike@co.olmsted.mn.us).

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### Water Quality Report

**Please click [here](#) to view our Water Quality Report. If you have any questions or concerns please contact (507) 775-3414.**



**Swimming Lessons**

The Byron Community Education is assisting with the sign up for swimming lessons. You can click [here](#) for more information and to register your child. If you have any questions, please contact City Hall at 775-3400. Thank you!

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**Park Board Committee - Seeking Volunteers**

The City of Byron is currently seeking volunteers for our Park Board Committee. If you are interested in volunteering you can click [here](#) for an application or contact City Hall for more

**Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan**



OLMSTED COUNTY NEWS RELEASE  
May 23, 2017

**Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan**  
Olmsted County has completed an updated draft of the County's Multi-Hazard Mitigation Plan (MHMP) as required by the Federal Disaster Mitigation Act of 2000 (DMA 2000). Local jurisdictions are required to update the plan every five years to remain eligible for pre-disaster and post-disaster mitigation grant programs.

Community involvement and feedback are vital to the success of the plan. Olmsted County invites public review and feedback of the draft plan prior to submitting it to the State of Minnesota and the Federal Emergency Management Agency (FEMA) for review. A copy of the draft MHMP and a survey for public feedback is available online at <https://scse.d.umn.edu/olmsted-county-mhmp>. The plan review and comment period will be open until Friday, June 9, 2017.

**About the Plan**  
The Olmsted County MHMP is a multi-jurisdictional plan that covers Olmsted County, including the cities of Byron, Chatfield, Dover, Eyota, Oronoco, Pine Island, and Stewartville. The Olmsted County MHMP also incorporates the concerns and needs of townships, school districts, and other stakeholders participating in the plan.

Olmsted County is vulnerable to a variety of potential natural disasters, which threaten the loss of life and property in the county. The plan addresses how to mitigate against hazards such as tornadoes, flooding, wildfires, blizzards, straight-line winds, ice storms, and droughts which have the potential for inflicting vast economic loss and personal hardship.

Update of the plan has been under direction of Olmsted County Emergency Management in cooperation with the University of Minnesota Duluth – Geospatial Analysis Center and representatives from County departments, local municipalities (city and township), school districts, and other key stakeholders such as utility providers. Together, the planning team worked to identify cost-effective and sustainable actions to reduce or eliminate the long-term risk to human life or property from natural hazards. Some examples include improvement of roads and culverts that experience repetitive flooding, construction of safe rooms at campgrounds, public parks, mobile home parks or schools to protect lives in the event of tornadoes or severe wind events; burying powerlines that may fall due to heavy snow, ice or wind storms; ensuring timely emergency communication to the public through warning sirens and mass notification systems, and conducting public awareness and education campaigns to help people be prepared to take safe action before, during, or following a hazard event.

**The Benefits of Hazard Mitigation Planning**  
Hazard mitigation planning ultimately helps us protect Olmsted County residents. By working with local communities we can identify vulnerabilities and develop strategies to reduce or eliminate the effects of a potential hazard. In addition, increasing public awareness of local hazards and disaster preparedness helps to create a community that is resilient to disaster, and breaks the cycle of response and recovery. Update of the plan will further allow the county and its jurisdictions to apply for eligible projects under future Hazard Mitigation Assistance (HMA) grant funding from FEMA for projects that are cost-effective and will help to reduce or eliminate impacts of future natural disaster events.

**Contact**  
For questions on the Olmsted County MHMP please contact Captain Mike Bromberg, Olmsted County Emergency Management Director. Phone: 507-328-6101 or Email: [Bromberg.mike@co.olmsted.mn.us](mailto:Bromberg.mike@co.olmsted.mn.us)



# Chatfield, Minnesota

*"The Chosen Valley"*






- Home
- About Chatfield
- Agenda and Minutes
- Applications & Forms
- Bluff County Hiking Club
- Brush & Leaf Dump
- Bus Schedule
- Business Directory
- CCTV
- Chatfield Center for the Arts
- Chatfield Public Library
- Chatfield Public Schools
- Chosen Valley Community Foundation
- Code of Ordinances
- Comp Plan 2015
- Financial Reports

Entertainment & Recreation
Local Govt & Administration
Community
Contact Us

## Public Review and Feedback Invited for Olmsted County's Multi-Hazard Mitigation Plan



2017\_05\_OC\_Hazard\_Mitigation\_Plan\_Newsrelease\_2(1).pdf

# City of Eyota

Eyota (e-yo-ta) meaning "superior"



Home
Visitors
Business
Citizens
Departments
History of Eyota

DID FLAGE OR STAKES GET PLACED ON YOUR PROPERTY?

Peoples Energy Co-op is installing new power cables. [Click HERE](#) for more information.



BUILD YOUR HOME or BUSINESS IN EYOTA! Fees Waived!



## Welcome from Eyota, MN

Eyota is a SE Minnesota community with a population of approximately 2,025 located along Highway 14 between Rochester and Winona. Just north of Interstate 90, Highway 42 brings travelers into town, where they can obtain gas, groceries, and/or eat at the downtown Country Café. The original town plat was laid along a railroad in 1864.

The city has several neighborhood parks throughout the town and two larger parks with ball diamonds. West Side Park is the largest park, spanning a three-block length along Hwy 42. It has two ball diamonds, a skate park, sand volleyball courts, children's play equipment, a shelter and a loop walking pathway. During the warmer months, a farmers market is held at this park on Tuesday evenings.

Businesses are located in the original downtown district and in a corridor along Highway 42, north and south of West Side Park. Arbor Gardens provides safe and comfortable housing, including assisted living and memory care for area senior residents. Two school facilities house the Dover-Eyota School District's grades pre-K through 12. There are five churches in Eyota.

The city is near Chester Woods, a regional county park, that offers a campground, swimming beach, walking trails, horse riding trails and canoe & kayak rentals. Access to a state walking/hiking trail is located

[Printer-friendly Version](#)

Multi-Hazard Mitigation Plan- 5-25-17 Updated Eyota Info

Click [HERE](#) to see the preparedness plan specific to Eyota. This is a draft and YOU are able to comment on-line in regards to the plan until Friday, June 9th.

This is the second invitation for the public to give their opinion on Multi-Hazard Mitigation Plans for Olmsted County.

This is planning for preparedness in natural disaster events in each city and required by every county in order to receive FEMA support in case of a

**DID FLAGE OR STAKES GET PLACED ON YOUR PROPERTY?**

Peoples Energy Co-op is installing new power cables. [Click HERE](#) for more information.



**BUILD YOUR HOME or BUSINESS IN EYOTA! Fees Waived!**



\$2,250 reduction of permit fees for new homes built in Eyota, available until December 31, 2017. [Click for flier.](#) Total commercial building fees waived: \$2,250.

**ROLLING HILLS TRANSIT**



**Welcome from Eyota, MN**

Eyota is a SE Minnesota community with a population of approximately 2,025 located along Highway 14 between Rochester and Winona. Just north of Interstate 90, Highway 42 brings travelers into town, where they can obtain gas, groceries, and/or eat at the downtown Country Café. The original town plat was laid along a railroad in 1864.

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The city is near Chester Woods, a regional county park, that offers a campground, swimming beach, walking trails, horse riding trails and canoe & kayak rentals. Access to a state walking/biking trail is located 2.5 miles north of the city--a long range plan promises bringing a state trail to the edge of town.



[Printer-friendly Version](#)

**Multi-Hazard Mitigation Plan- 5-25-17 Updated Eyota Info**

Click [HERE](#) to see the preparedness plan specific to Eyota. This is a draft and YOU are able to comment on-line in regards to the plan until Friday, June 9th.

This is the second invitation for the public to give their opinion on Multi-Hazard Mitigation Plans for Olmsted County.

This is planning for preparedness in natural disaster events in each city and required by every county in order to receive FEMA support in case of a future hazardous event. Click [HERE](#) to see the invitation for your feedback.

**Eyota Compost and Mulch Site**

Eyota Compost and Mulch Site is NOW OPEN.

NOW Extended hours on Wednesday to 8pm

Hours are:  
7:30am - 4pm Mon, Tue, Thur, Fri  
7:30am - 8pm Wednesday

# Appendix G

## Mitigation Actions by Jurisdiction

Table G - 1. Mitigation Actions Identified for Implementation by the City of Byron (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets
3	All-Hazards	Education & Awareness Programs	Provide outreach to the hospitality industry and visitors to the area with education and awareness on natural hazards in the County.	New	Moderate	2017-2021	Olmsted County <b>Byron</b> Eyota Stewartville	OC Emergency Management and Public Health in collaboration with local cities.	Local CVBs and tourism bureaus are encouraged to sign up for OC Emergency Management social media (Facebook/Twitter) to receive information. OC will coordinate with the City of Rochester on this effort.	County/City budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets
5	All-Hazards	Mitigation Preparedness & Response Support	Collect and update critical data of use for OC emergency management and incorporate into annual Emergency Operations Plan updates as appropriate.	Ongoing	High	2017-2021	Olmsted County <b>Byron</b> Oronoco Pine Island	OC Emergency Management and OC Public Health	This is a standing effort of the OC Emergency Management Program. OC Public Health also has an All-Hazards Response Plan.	County Budget
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
9	Severe Winter Storms / Summer Storms	Structure and Infrastructure Projects	Identify aboveground power lines vulnerable to failure during severe ice storm or wind events and work with public utilities to evaluate/implement mitigation projects such as hardening or burying of power lines as needed.	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Stewartville	OC Public Works and Electric Coops (People’s Energy Cooperative /Xcel Energy)	OC will work with electric utilities to identify areas of the county in which overhead distribution and transmission power lines are more susceptible to ice build-up, wind, or other damage during storms and develop options to mitigate the exposure to damage and/or the shortening of restoration of service time.	Energy Coop Funding <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Pine Island Stewartville	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/City budgets
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain "Storm Ready" community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect.	County/City Budgets
16	Extreme Temps (Heat / Cold)	Education & Awareness Programs	Provide outreach & education to vulnerable populations in the community (i.e., senior citizens, young adults) on personal safety measures to take during periods of extreme heat / cold.	New	High	2017-2021	Olmsted County <b>Byron</b> Eyota Stewartville	OC Emergency Management, OC Public Health, and OC Community Services in collaboration with local cities.	OC Public Health sends out an advisory notice directly to Mobile Home Park operators within the County during periods of extreme heat to alert them of the dangers of extreme heat for MHP residents, and the need to provide cooling shelter if it is available.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Pine Island Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
20	Flooding	Structure and Infrastructure Projects	Upgrade existing rain gauges in certain areas of the County (NW of the County and Oxbow Park).	New	Moderate	2017-2021	Olmsted County <b>Byron</b> Eyota	OC SWCD & Public Works	Olmsted SWCD has a rain gauge network where volunteers collect precipitation information daily and submit to the county and state monthly. The SWCD can seek additional volunteers to expand the precipitation monitoring network into strategic locations that assist with modeling and trend analysis.	County Budgets, other state or local funding
24	Flooding	Local Planning & Regulations / Natural Systems Protection	Continue to update and implement existing plans (i.e., South Zumbro CIP) to help reduce long-term vulnerability of flooding and erosion to key waterways.	New	Moderate	2017-2021	Olmsted County Byron Stewartville	OC SWCD and OC Env. Resources	Identify and prioritize key best management practices through the County Water Plan and future One Water shed, One Plan (1W1P) process that store water on the landscape and reduce peak flows.	County Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
25	Flooding	Natural Systems Protection	Identify and implement habitat restoration projects along the Zumbro River that will help reduce flooding by providing temporary storage within the river corridor.	New	Moderate	2017-2021	Olmsted County <b>Byron</b> Oronoco	OC Env. Resources, OC SWCD	SWCD could work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established or implementation of best management practices that store water on the land and reduce peak flows.	County Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA funding for Flood Diversion &amp; Storage</b>
26	Flooding	Local Planning & Regulations	Work with private landowners (farmers) to obtain easements for water storage on their property to help reduce prolonged flood duration in cropland areas.	New	Moderate	2017-2021	Olmsted County <b>Byron</b> Eyota Pine Island	OC SWCD and OC Env. Resources	SWCD can assist with identifying landowners, operators and locations where best management practice may be most effective in reducing impacts of flooding.	County Budgets, MN Board of Water and Soil Resources (BWSR), and Farm program funding
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events.	Ongoing	Moderate	2017-2021	Olmsted County <b>Byron</b> Dover Pine Island Stewartville	Rochester-Olmsted Planning Dept., OC Public Works, and OC SWCD	OC Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit. OC will work to coordinate with local cities on this. Effects of not doing so may result in flooding in Rochester.	County Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Pine Island Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>
37	Erosion, Landslides & Karst	Local Planning & Regulations	Create new standards in the OC Zoning Ordinance to address karst features and protection of the groundwater system in the county.	In Progress	Moderate	2017-2021	Olmsted County <b>Byron</b>	Rochester-Olmsted Planning Dept., OC Env. Resources, and SWCD	OC Planning will work in coordination with SWCD & Environmental Resources to address planning for new standards in the ordinance to address karst impact on groundwater supply.	County Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
41	Wildfire	Education & Awareness Programs / Local Planning & Regulations	Encourage public or private property owners (such as land owners, parks or campgrounds) to incorporate defensible space and fuels reduction around new or existing structures that may be at-risk of wildfire. Incorporate into local building codes as appropriate.	New	High	2017-2021	Olmsted County <b>Byron</b> Pine Island Stewartville	OC Emergency Management, OC Public Works, and local fire depts.	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	<b>Possible FEMA HMGP or PDM funding for Defensible Space or Fuels Reduction</b>
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Eyota Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	County/City Budgets
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
44	Drought	Local Planning & Regulations	Strengthen water conservation measures in the building code for each jurisdiction by educating the public and contractors.	Ongoing	Moderate	2017-2021	Olmsted County <b>Byron</b> Eyota Stewartville	Rochester-Olmsted Planning Dept.	Local governments will address water conservation measures in scheduled updates for land use and ordinances.	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County <b>Byron</b> Chatfield Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets

Table G - 2. Additional Mitigation Actions Identified for the City of Byron for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Byron Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Flooding	Local Planning & Regulations	Remove sediment from storm water ponds to prevent overflow.	New	High	2017-2021	City of Byron	Public Works Department	We have City staff and consultants that evaluate the road maintenance issues and storm water pond issues.	City Budget
2	Flooding	Local Planning & Regulations	Identify homes in the city that have reoccurring basement flooding and work with homeowners to identify/implement mitigation measures.	Ongoing	High	2017-2021	City of Byron	Local City planning and Public Works depts.	Byron is not aware of any reoccurring basement flooding at this time.	County/City Budgets
3	Flooding	Education & Awareness Programs	Help homeowners to reduce flood damage to properties through education on drainage of stormwater, easements in their yard, landscaping elevation, and pond maintenance.	New	High	2017-2021	City of Byron	City Admin & Public Works	Byron will continue to educate via mailings, meetings, Facebook and the website on stormwater drainage and easements.	City Budget
4	Severe Winter Storms / Summer Storms	Mitigation Preparedness & Response Support	Ensure the city has generator backup power for critical facilities such as City Hall.	New	High	2017-2021	City of Byron	City Admin & Public Works	Byron will incorporate funds into their budget to make backup generators available.	City Budget/Grants
5	All-Hazards	Local Planning & Regulations	Use capital improvement funding to plan for or fund an Emergency Manager for the City of Byron.	New	High	2017-2021	City of Byron	City Admin.	The City's Emergency Manager has recently stepped down so we are in transition; the spot is being filled by the City Administrator and the Fire Chief.	City Budget

Table G - 3. Mitigation Actions Identified for Implementation by the City of Chatfield (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of Chatfield’s Emergency Management Plan. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	The City of Chatfield will work to promote safety awareness information and campaigns to the Chatfield residence via NWS severe weather awareness weeks, OCEM website, social media, and local TV/radio.	County/City budgets
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	The City of Chatfield will work to identify a need for backup power for respective critical facilities as a capability gap to address for all-hazards for the City of Chatfield.	County/City budgets
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	The City of Chatfield will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
9	Severe Winter Storms / Summer Storms	Structure and Infrastructure Projects	Identify aboveground power lines vulnerable to failure during severe ice storm or wind events and work with public utilities to evaluate/implement mitigation projects such as hardening or burying of power lines as needed.	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Stewartville	OC Public Works and Electric Coops (People’s Energy Cooperative /Xcel Energy)	The City of Chatfield will work with electric utilities People’s Energy and Tri-County Electric to identify areas of the city in which overhead distribution and transmission power lines are more susceptible to ice build-up, wind, or other damage during storms and develop options to mitigate the exposure to damage and/or the shortening of restoration of service time.	Energy Coop Funding <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Pine Island Stewartville	OC Emergency Management	This is a standing effort of the City of Chatfield’s Emergency Management program to assist their campground, schools, mobile home park.	County/City budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Chatfield’s Emergency Management will coordinate with OC Emergency Management on any potential community safe room project.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain “Storm Ready” community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities. Chatfield is looking into participating in the “Storm Ready” program.	County/City Budgets
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Pine Island Stewartville	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local cities	Chatfield’s Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect. Chatfield is a “Tree City USA” member.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains a policy that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works /MN Dot transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/City budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Pine Island Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Chatfield will work with Fillmore and Olmsted SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established. Chatfield's buffer areas have been approved by SWCD.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The City participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The City participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Pine Island Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Chatfield has developed a Storm Water CIP plan for future improvements.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County and Fillmore County. Chatfield Emergency Management will use the DNR website and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Eyota Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Chatfield promotes fire awareness and safety via National Fire Prevention Week (i.e. mailers, city website, poster contest)	County/City Budgets
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	Chatfield will look to address all-hazards in coordination with other key county departments (such as SWCD regarding drought). Update DNR Water Conservation Plan.	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron <b>Chatfield</b> Dover Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the City of Chatfield.	County/City Budgets

Table G - 4. Additional Mitigation Actions Identified for the City of Chatfield for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Chatfield Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Flooding	Natural Systems Protection	Identify local mitigation measures that address flooding and erosion (bank restoration) for areas along Mill Creek, the Root River, Hillside Drive, and County 10 stormwater holding ponds.	New	High	2017-2021	City of Chatfield	Public Works	Chatfield Stormwater CIP: Etc. - Margaret St waterway, Mill Creek Park, Groen Park, Root River, Hillside Dr., County Rd. 10 waterway, West Chatfield. To include all waterways coming into Chatfield including both Fillmore and Olmsted Counties.	City Funding, SWCD, and possible FEMA HMA Funding for Erosion/Flood Mitigation Projects
2	Severe Winter Storms / Severe Summer Storms	Mitigation Preparedness & Response Support	Acquire generators for critical facilities to provide backup power and continuity of operations in the event of a power outage from severe storms. (Such as for the Firehall, Booster station, and wells)	New	High	2017-2021	City of Chatfield	City Admin & Public Works	Look to install generators for Wells #2 and 3, Booster Station and 2 lift stations.	City Budget Possible FEMA HMA Funding for generators
3	Severe Summer Storms	Structure & Infrastructure Projects	Work with the local mobile park to make improvements to its storm shelter. Evaluate for potential new construction of a safe room.	New	High	2017-2021	City of Chatfield	Local Gov.	The City will work with Chatfield Mobile Park on this effort.	City Budget Possible FEMA HMA Funding for Safe Room Construction
4	All-Hazards	Mitigation Preparedness & Response Support	To identify and acquire improvements needed for a functional emergency operations center.	New	High	2017-2021	City of Chatfield	Local Gov.	The City will address EOC possibilities at City Hall, Firehall and police Depts.	City Budget

Table G - 5. Mitigation Actions Identified for Implementation by the City of Dover (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Pine Island Stewartville	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/City budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain "Storm Ready" community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Pine Island Stewartville	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/City budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Pine Island Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Investigate participation in the NFIP's "Community Rating System" (CRS) that would affect flood insurance rates.	Ongoing	Moderate	2017-2021	Olmsted County <b>Dover</b> Pine Island Oronoco Stewartville	Rochester-Olmsted Planning Dept.	Once new floodplain maps are adopted, OC will review participation in the CRS.	County Budgets
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
30	Flooding	Local Planning & Regulations	Map all properties covered by Letters of Map Amendment and Letters of Map Revision. (Those LOMR's that list properties but do not amend the FIRM panel.)	In Progress	High	2017	Olmsted County <b>Dover</b> Stewartville	Rochester-Olmsted Planning Dept.	This is a standing procedure of OC Planning and Zoning.	County Budgets
31	Flooding	Local Planning & Regulations	Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events.	Ongoing	Moderate	2017-2021	Olmsted County Byron <b>Dover</b> Pine Island Stewartville	Rochester-Olmsted Planning Dept., OC Public Works, and OC SWCD	OC Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit. OC will work to coordinate with local cities on this. Effects of not doing so may result in flooding in Rochester.	County Budgets

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
32	Flooding	Education & Awareness Programs	Develop educational materials and promote shoreland buffer vegetation Best Management Practices, and monitoring.	Ongoing	Low	2017-2021	Olmsted County <b>Dover</b> Eyota Stewartville	OC SWCD	Recently the State of MN adopted new policies that OC will need to enforce. SWCD is a key player.	County Budgets
33	Flooding	Local Planning & Regulations	Identify measures to limit infiltration to the Dover and Eyota portions of the Dover/Eyota/St. Charles sewer system.	In Progress	High	2017-2021	Olmsted County Eyota <b>Dover</b> Pine Island	Rochester-Olmsted Planning Dept. and City of Eyota Admin / Public Works	The City of Eyota is in phase 2 of 3 in having all concrete curbs, gutters, and larger storm drains. There is still flooding in the City of Eyota and in houses but they are working on it.	County/City Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Pine Island Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County. OC Emergency Management will use its website, Facebook/Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
45	Drought	Local Planning & Regulations	Encourage the development of a response plan that addresses the needs of agriculture during a severe drought.	Ongoing	Low	2017-2021	Olmsted County <b>Dover</b> Eyota	OC Emergency Management in collaboration with SWCD	OC is working with the USDA Farm Service Agents and Soil and Water divisions.	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield <b>Dover</b> Eyota Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets

Table G - 6. Additional Mitigation Actions Identified by the City of Dover for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Dover Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Flooding	Education & Awareness Programs	Increase awareness of local citizens of building codes and easements to mitigate against local flood damages and stormwater management.	New	High	2017-2021	City of Dover	City Admin & Public Works	The City of Dover will educate citizens on building codes and easements through public meetings and the city website. Code enforcement to ensure compliance.	County/City Budget
2	Flooding	Local Planning & Regulations	Identify homes in the city that have reoccurring basement flooding and work with homeowners to identify/implement/mitigation measures.	Ongoing	High	2017-2021	City of Dover	Local City planning and Public Works depts.	The City of Dover will continue with street upgrades to include concrete gutter and storm drains in areas that lack them. Monitor heavy rain events to identify areas of concern.	County/City Budgets
3	Severe Winter & Summer Storms	Local Planning & Regulations	Work to obtain "Storm Ready" certification by meeting all National Weather Service program requirements.	New	High	2017-2021	City of Dover	City Admin	The City of Dover will continue working with County resources and the NWS in LaCrosse, WI to maintain the city's status as "Storm Ready"	City Budget
4	All-Hazards	Education & Awareness Programs	Utilize city website and social media to educate citizens about emergency preparedness and convey critical information during emergency events.	New	High	2017-2021	City of Dover	City Admin	The City of Dover will ensure the City website and social media sites are updated in a timely manner to notify citizens of emergency situations and hazards. The City will encourage the use of social media by citizens to keep informed of pertinent information.	City Budget

Table G - 7. Mitigation Actions Identified for Implementation by the City of Eyota (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets
3	All-Hazards	Education & Awareness Programs	Provide outreach to the hospitality industry and visitors to the area with education and awareness on natural hazards in the County.	New	Moderate	2017-2021	Olmsted County Byron <b>Eyota</b> Stewartville	OC Emergency Management and Public Health in collaboration with local cities.	Local CVBs and tourism bureaus are encouraged to sign up for OC Emergency Management social media (Facebook/Twitter) to receive information. OC will coordinate with the City of Rochester on this effort.	County/City budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Pine Island Stewartville	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/City budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain "Storm Ready" community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Pine Island Stewartville	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect.	County/City Budgets
16	Extreme Temps (Heat / Cold)	Education & Awareness Programs	Provide outreach & education to vulnerable populations in the community (i.e., senior citizens, young adults) on personal safety measures to take during periods of extreme heat / cold.	New	High	2017-2021	Olmsted County Byron <b>Eyota</b> Stewartville	OC Emergency Management, OC Public Health, and OC Community Services in collaboration with local cities.	OC Public Health sends out an advisory notice directly to Mobile Home Park operators within the County during periods of extreme heat to alert them of the dangers of extreme heat for MHP residents, and the need to provide cooling shelter if it is available.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/City budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Pine Island Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
20	Flooding	Structure and Infrastructure Projects	Upgrade existing rain gauges in certain areas of the County (NW of the County and Oxbow Park).	New	Moderate	2017-2021	Olmsted County Byron <b>Eyota</b>	OC SWCD & Public Works	Olmsted SWCD has a rain gauge network where volunteers collect precipitation information daily and submit to the county and state monthly. The SWCD can seek additional volunteers to expand the precipitation monitoring network into strategic locations that assist with modeling and trend analysis.	County Budgets, other state or local funding

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
26	Flooding	Local Planning & Regulations	Work with private landowners (farmers) to obtain easements for water storage on their property to help reduce prolonged flood duration in cropland areas.	New	Moderate	2017-2021	Olmsted County Byron <b>Eyota</b> Pine Island	OC SWCD and OC Env. Resources	SWCD can assist with identifying landowners, operators and locations where best management practice may be most effective in reducing impacts of flooding.	County Budgets, MN Board of Water and Soil Resources (BWSR), and Farm program funding
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
32	Flooding	Education & Awareness Programs	Develop educational materials and promote shoreland buffer vegetation Best Management Practices, and monitoring.	Ongoing	Low	2017-2021	Olmsted County Dover <b>Eyota</b> Stewartville	OC SWCD	Recently the State of MN adopted new policies that OC will need to enforce. SWCD is a key player.	County Budgets
33	Flooding	Local Planning & Regulations	Identify measures to limit infiltration to the Dover and Eyota portions of the Dover/Eyota/St. Charles sewer system.	In Progress	High	2017-2021	Olmsted County <b>Eyota</b> Dover Pine Island	Rochester-Olmsted Planning Dept. and City of Eyota Admin / Public Works	The City of Eyota is in phase 2 of 3 in having all concrete curbs, gutters, and larger storm drains. There is still flooding in the City of Eyota and in houses but they are working on it.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Pine Island Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County. OC Emergency Management will use it’s website, Facebook/Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County Byron Chatfield <b>Eyota</b> Pine Island Stewartville	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with other gov’t agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
44	Drought	Local Planning & Regulations	Strengthen water conservation measures in the building code for each jurisdiction by educating the public and contractors.	Ongoing	Moderate	2017-2021	Olmsted County Byron <b>Eyota</b> Stewartville	Rochester-Olmsted Planning Dept.	Local governments will address water conservation measures in scheduled updates for land use and ordinances.	County/City Budgets
45	Drought	Local Planning & Regulations	Encourage the development of a response plan that addresses the needs of agriculture during a severe drought.	Ongoing	Low	2017-2021	Olmsted County Dover <b>Eyota</b>	OC Emergency Management in collaboration with SWCD	OC is working with the USDA Farm Service Agents and Soil and Water divisions.	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Eyota</b> Oronoco Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets

Table G - 8. Additional Mitigation Actions Identified for the City of Eyota for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Flooding	Natural Systems Protection	Maintain cleaning of stormwater ponds to ensure their effectiveness against flooding.	New	High	2017-2021	City of Eyota	Public Works	The City of Eyota monitors ponds and clean when needed with the help of City Engineers.	City Budget
2	Flooding	Local Planning & Regulations	Identify homes in the city that have reoccurring basement flooding and work with homeowners to identify/implement mitigation measures.	Ongoing	High	2017-2021	City of Eyota	Local City planning and Public Works depts.	The City of Eyota will use 2007 information survey from homeowners, Storm Water Studies, installation of sub Drains.	County/City Budgets
3	Flooding	Structure & Infrastructure Projects	In neighborhoods, work with homeowners to identify and flood mitigation measures such as elevations of houses and grading of lots where flood damage is an issue.	New	High	2017-2021	City of Eyota	City Admin & Public Works	The City of Eyota will work with Contractors and City Engineer to insure new construction grading plans will not impact neighborhoods.	City / Private
4	Flooding	Local Planning & Regulations	Regulate zoning and building permit applications to ensure new construction does not occur in flood-prone areas.	New	High	2017-2021	City of Eyota	City Admin	City of Eyota Planning and Zoning and City Engineer will review building permits.	City
5	Flooding	Education & Awareness Programs	Encourage homeowners to implement landscaping to promote drainage of stormwater, and to have a working sump-pump.	New	High	2017-2021	City of Eyota	City Admin	The City of Eyota will use education materials, City Sump Pump Inspections. Use of sub-drain tiles in neighborhoods.	City / County

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
5	Flooding	Structure & Infrastructure Projects	Identify measures to limit infiltration to the Dover and Eyota portions of the Dover/Eyota/St. Charles sewer system.	Ongoing	High	2017-2021	City of Eyota	City of Eyota Public Works in collaboration with Olmsted County Planning/Land Use	The City of Eyota Public Works Supervisor works with our contracted City Engineer, WHKS, to address roads, streets and culverts in town and in the past 5 years have a comprehensive plan to address issue of flooding within the City of Eyota.	City
6	Flooding	Structure & Infrastructure Projects	Through land acquisition, and develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property in Eyota.	Ongoing	High	2017-2021	City of Eyota	City of Eyota Public Works in collaboration with Olmsted County Planning/Land Use	The City of Eyota works with Olmsted County Soil and Water, our City Engineer, and WHKS to set up and address the need to improve our flood water management plan in regards to culver replacement and the development of wetland improvements within the City of Eyota.	State / County/City
7	Severe Winter Storms / Severe Summer Storms	Mitigation Preparedness & Response Support	Identify critical facilities that require backup power and acquire generators to provide backup power and continuity of operations in the event of a power outage from severe storms.	New	High	2017-2021	City of Eyota	City Emergency Manager	The City of Eyota currently has an Emergency Manager (Council Member) and a Deputy Director (Fire Safety Chief from the Fire Department) that would oversee this effort.	Federal/ State/County City

#	Hazard	Mitigation Strategy	City of Eyota Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Summer Storms	Local Planning & Regulations	Work with the local mobile home park in town to ensure they meet storm shelter requirements set by MDH.	Ongoing	Mod	2017-2021	City of Eyota	City Emergency Manager City Council	The City of Eyota currently has one mobile home park that has privately owned lots. Efforts have been made to instruct occupants on closest shelter which is currently in the City Park.	City / Private

Table G - 9. Mitigation Actions Identified for Implementation by the City of Oronoco (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Mitigation Preparedness & Response Support	Collect and update critical data of use for OC emergency management and incorporate into annual Emergency Operations Plan updates as appropriate.	Ongoing	High	2017-2021	Olmsted County Byron <b>Oronoco</b> Pine Island	OC Emergency Management and OC Public Health	This is a standing effort of the OC Emergency Management Program. OC Public Health also has an All-Hazards Response Plan.	County Budget
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain “Storm Ready” community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Stewartville	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/City budgets

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
25	Flooding	Natural Systems Protection	Identify and implement habitat restoration projects along the Zumbro River that will help reduce flooding by providing temporary storage within the river corridor.	New	Moderate	2017-2021	Olmsted County Byron <b>Oronoco</b>	OC Env. Resources, OC SWCD	SWCD could work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established or implementation of best management practices that store water on the land and reduce peak flows.	County Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA funding for Flood Diversion &amp; Storage</b>

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
28	Flooding	Local Planning & Regulations	Investigate participation in the NFIP's "Community Rating System" (CRS) that would affect flood insurance rates.	Ongoing	Moderate	2017-2021	Olmsted County Dover Pine Island <b>Oronoco</b> Stewartville	Rochester-Olmsted Planning Dept.	Once new floodplain maps are adopted, OC will review participation in the CRS.	County Budgets
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota <b>Oronoco</b> Pine Island City of Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County. OC Emergency Management will use its website, Facebook/Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Oronoco</b> Pine Island Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets

Table G - 10. Additional Mitigation Actions Identified for the City of Orinoco for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Oronoco Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Severe Winter Storms / Severe Summer Storms	Mitigation Preparedness & Response Support	Acquire generators for critical facilities to provide backup power and continuity of operations in the event of a power outage from severe storms.	New	High	2017-2021	City of Oronoco	City Admin & Public Works		City Budget
2	Flooding	Local Planning & Regulations	Include residential landscaping regulation in city zoning ordinance for new construction to assist stormwater runoff and reduce local flooding around homes.	New	High	2017-2021	City of Oronoco	City Planning & Zoning		City Budget
3	Flooding	Local Planning & Regulations	Enforce regulation on cleanout of stormwater retention ponds. Our city requires HSA management.	New	High	2017-2021	City of Oronoco	City Planning & Zoning		City Budget
4	Dam Failure	Structure & Infrastructure Projects	Communicate with the MN DNR regarding upkeep of the dam and shoreline for the Oronoco dam. (Report any local concerns or damages to MN DNR).	Ongoing	High	2017-2021	City of Oronoco	Olmsted County Environmental Services, City Admin & Public Works	MN DNR is responsible for dam maintenance. During the floods in Oronoco, the dam gave out and flooded the city.	City Budget

Table G - 11. Mitigation Actions Identified for Implementation by the City of Pine Island (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
5	All-Hazards	Mitigation Preparedness & Response Support	Collect and update critical data of use for OC emergency management and incorporate into annual Emergency Operations Plan updates as appropriate.	Ongoing	High	2017-2021	Olmsted County Byron Oronoco <b>Pine Island</b>	OC Emergency Management and OC Public Health	This is a standing effort of the OC Emergency Management Program. OC Public Health also has an All-Hazards Response Plan.	County Budget
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Pine Island</b> Stewartville	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/City budgets
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain “Storm Ready” community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County Chatfield Dover Eyota <b>Pine Island</b> Stewartville	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/City Budgets
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages. Assist in getting FEMA flood maps and GIS area maps.	County/City budgets

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Pine Island</b> Stewartville	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
21	Flooding	Structure and Infrastructure Projects	Work with Dodge County to install rain gauges on the Zumbro River to help prevent flooding in OC.	New	Moderate	2017-2021	Olmsted County <b>Pine Island</b>	OC Env. Resources	OC will work to coordinate with Dodge County and the City of Pine Island on funding for new monitors as well as maintenance on current system.	Dodge County, OC Funding <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
26	Flooding	Local Planning & Regulations	Work with private landowners (farmers) to obtain easements for water storage on their property to help reduce prolonged flood duration in cropland areas.	New	Moderate	2017-2021	Olmsted County Byron Eyota <b>Pine Island</b>	OC SWCD and OC Env. Resources	SWCD can assist with identifying landowners, operators and locations where best management practice may be most effective in reducing impacts of flooding.	County Budgets, MN Board of Water and Soil Resources (BWSR), and Farm program funding
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
31	Flooding	Local Planning & Regulations	Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events.	Ongoing	Moderate	2017-2021	Olmsted County Byron Dover <b>Pine Island</b> Stewartville	Rochester-Olmsted Planning Dept., OC Public Works, and OC SWCD	OC Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit. OC will work to coordinate with local cities on this. Effects of not doing so may result in flooding in Rochester.	County Budgets
33	Flooding	Local Planning & Regulations	Identify measures to limit infiltration to the Dover and Eyota portions of the Dover/Eyota/St. Charles sewer system.	In Progress	High	2017-2021	Olmsted County Eyota Dover <b>Pine Island</b>	Rochester-Olmsted Planning Dept. and City of Eyota Admin / Public Works	The City of Eyota is in phase 2 of 3 in having all concrete curbs, gutters, and larger storm drains. There is still flooding in the City of Eyota and in houses but they are working on it.	County/City Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota <b>Pine Island</b> Stewartville	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County. OC Emergency Management will use its website, Facebook/Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets
41	Wildfire	Education & Awareness Programs / Local Planning & Regulations	Encourage public or private property owners (such as land owners, parks or campgrounds) to incorporate defensible space and fuels reduction around new or existing structures that may be at-risk of wildfire. Incorporate into local building codes as appropriate.	New	High	2017-2021	Olmsted County Byron <b>Pine Island</b> Stewartville	OC Emergency Management, OC Public Works, and local fire depts.	Pine Island has held Community Flood Control meetings for mutual information. Pine Island has been working with the local Golf Course on Flood protection ideas.	<b>Possible FEMA HMGP or PDM funding for Defensible Space or Fuels Reduction</b>
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Eyota <b>Pine Island</b> Stewartville	OC Emergency Management in cooperation with local fire departments	Pine Island Fire Dept. meets with Elementary kids every year for fire prevention and safety education.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Pine Island</b> Stewartville	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments. Pine Island has a conservation ordinance and is enforced by misdemeanor laws.	County/City Budgets

Table G - 12. Additional Mitigation Actions Identified for the City of Pine Island for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Severe Winter Storms / Severe Summer Storms	Mitigation Preparedness & Response Support	Acquire generators for critical facilities to provide backup power and continuity of operations in the event of a power outage from severe storms.	New	High	2017-2021	City of Pine Island	City Admin & Public Works	Emergency Manager budgeted 2017 funds for an EOC generator and is working on funding for a City shop generator.	City Budget
2	Severe Summer Storms	Mitigation Preparedness & Response Support	Work with City Council and Developers to ensure new warning sirens are obtained for the city as it expands with new development.	New	High	2017-2021	City of Pine Island	City Admin	City Council will evaluate and discuss in coordination with future developers. The City will also seek input from Olmsted County Emergency Management. PI EM proposed an ordinance that new developments pay for their portion of an emergency siren, which was passed by PI Council.	Potentially funded by Developer.
3	Flooding	Local Planning & Regulations	Enforce local planning and zoning address ordinances for new construction in local floodplain zones.	Ongoing	High	2017-2021	City of Pine Island	City Admin	Pine Island has a 10-year Comprehensive Plan that deals with future growth and land use for the City. Pine Island also has a Planning and Zoning Commission and an established flood plain ordinance. The City participates in the National Flood Insurance Plan (NFIP).	City Budget
4	Flooding	Structure and Infrastructure Projects	Identify new mitigation measures the city can implement to reduce long-term vulnerability to localized flooding (i.e., construction of retention ponds, maintenance of storm sewers).	New	High	2017-2021	City of Pine Island	City Public Works	The City is working on addressing funding gaps for water/sanitary sewer/storm sewer infrastructure upgrades by establishing a rate structure that would help offset costs.	City Budget

#	Hazard	Mitigation Strategy	City of Pine Island Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
5	Flooding	Mitigation Preparedness & Response Support	Ensure the city has access to sandbagging supplies in the event of a flood event to protect areas vulnerable to flooding.	Ongoing	High	2017-2021	City of Pine Island	Pine Island Emergency Management	Pine Island Emergency Management has 20,000 sand bags, 9 bag fillers, 3,000 ties, 25 tie tools, 20 shovels and 30 yards of sand at all times.	City Emergency Management Budget

Table G - 13. Mitigation Actions Identified for Implementation by the City of Stewartville (2017-2021) (From Olmsted County Master Mitigation Action Chart)

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
1	All-Hazards	Mitigation Preparedness & Response Support	Identify and map locations of vulnerable populations for emergency response and develop a communications plan to notify vulnerable populations.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management, Public Health, and Community Services in collaboration with local cities. Rochester-Olmsted Planning will provide GIS work.	This is a standing effort of the OC Emergency Management Program. OC will work in collaboration with local cities to gather information on vulnerable populations within their jurisdictions. OC operates IPAWS for emergency notifications.	County/City budgets
2	All-Hazards	Mitigation Preparedness & Response Support	Encourage facilities that care for vulnerable populations (i.e., senior facilities, day care centers) to have emergency plans in place in the event of severe storms, extreme temperatures, or other events that require emergency measures to save lives.	Ongoing	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management, Public Health, and Community Services in collaboration with local cities.	This is a standing effort of OC Emergency Management and Public Health. Ensuring such facilities have emergency plans will help to alleviate potential response measures, such as evacuation assistance.	County/City budgets
3	All-Hazards	Education & Awareness Programs	Provide outreach to the hospitality industry and visitors to the area with education and awareness on natural hazards in the County.	New	Moderate	2017-2021	Olmsted County Byron Eyota <b>Stewartville</b>	OC Emergency Management and Public Health in collaboration with local cities.	Local CVBs and tourism bureaus are encouraged to sign up for OC Emergency Management social media (Facebook/Twitter) to receive information. OC will coordinate with the City of Rochester on this effort.	County/City budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
4	All-Hazards	Education & Awareness Programs	Promote emergency preparedness education & awareness for individuals, families, and businesses through use of websites, social media, and in-person events.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in collaboration with OC Public Health, local cities, and other key partners (i.e., power companies, American Red Cross).	OC Emergency Management regularly promotes safety awareness information and campaigns to the public (i.e., NWS severe weather awareness weeks) via OCEM website, social media, and local TV/radio.	County/City budgets
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management, City Admin and Public Works departments	OC and all jurisdictions identified a need for backup power for respective critical facilities as a capability gap to address for all-hazards.	County/City budgets
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management, City Admin and Public Works depts.	OC, local city governments, and schools will evaluate feasibility to purchase and install generators for key facilities.	County/City Budgets <b>Possible FEMA HMA 5% Initiative funding</b>

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management and Public Health, and OC Communications Director	This is standing effort of OC’s Emergency Management Program and is shared with local schools and jurisdictions to promote in their own means of delivery (i.e., programs, websites and events.)	County/City budgets
9	Severe Winter Storms / Summer Storms	Structure and Infrastructure Projects	Identify aboveground power lines vulnerable to failure during severe ice storm or wind events and work with public utilities to evaluate/implement mitigation projects such as hardening or burying of power lines as needed.	New	High	2017-2021	Olmsted County Byron Chatfield <b>Stewartville</b>	OC Public Works and Electric Coops (People’s Energy Cooperative /Xcel Energy)	OC will work with electric utilities to identify areas of the county in which overhead distribution and transmission power lines are more susceptible to ice build-up, wind, or other damage during storms and develop options to mitigate the exposure to damage and/or the shortening of restoration of service time.	Energy Coop Funding <b>Possible FEMA HMA funding for Infrastructure Retrofit</b>
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island <b>Stewartville</b>	OC Emergency Management	This is a standing effort of the OC Emergency Management program. OC Public Health may be able to assist with some data.	County/City budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in coordination with local city or school.	Any community safe room projects that the County is involved in will be part of the OC Emergency Management program.	County/City budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>
12	Severe Summer Storms	Education & Awareness Programs / Mitigation Preparedness & Response Support	Work to establish and maintain “Storm Ready” community designation for cities in OC.	New	Moderate	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management	OC Emergency Management works to encourage all cities to become Storm Ready communities.	County/City Budgets
13	Severe Summer Storms	Local Planning & Regulations	Work to ensure Minnesota Department of Health Evacuation Plan & Storm Shelter Requirements are met in municipalities with manufactured home parks.	Ongoing	Moderate	2017-2021	Olmsted County Chatfield Dover Eyota Pine Island <b>Stewartville</b>	Local City Planning & Zoning with assistance from OC Public Health (to provide supporting local data)	It is the responsibility of local cities to work in coordination with MHP operators within their city to meet this MDH requirement. OC Public Health has data on the locations of MPHs within the county and whether they have a storm shelter or not. PH can act in a resource-role to cities that are seeking to work with their local MPH.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
14	Severe Summer Storms	Mitigation Preparedness & Response Support	Provide “Storm Spotter” training on an annual basis in communities for local fire departments and local residents to become trained volunteers.	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Dover Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in collaboration with local cities	OC Emergency Management promotes the Storm Spotter program every year. All of the Cities in OC participate in training each year.	County/City Budgets
15	Extreme Temps (Heat / Cold)	Local Planning & Regulations	Encourage use of vegetation (i.e., tree planting) in communities to help reduce impacts of extreme heat temperatures.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco <b>Stewartville</b>	OC SWCD, Local City Planning & Zoning	Cities will be encouraged to consider this action as part of their local comprehensive plans, as small cities expand into farmland with little to no tree cover and may be exposed to the “heat island” effect.	County/City Budgets
16	Extreme Temps (Heat / Cold)	Education & Awareness Programs	Provide outreach & education to vulnerable populations in the community (i.e., senior citizens, young adults) on personal safety measures to take during periods of extreme heat / cold.	New	High	2017-2021	Olmsted County Byron Eyota <b>Stewartville</b>	OC Emergency Management, OC Public Health, and OC Community Services in collaboration with local cities.	OC Public Health sends out an advisory notice directly to Mobile Home Park operators within the County during periods of extreme heat to alert them of the dangers of extreme heat for MHP residents, and the need to provide cooling shelter if it is available.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
17	Flooding	Local Planning & Regulations	Update land use plans and floodplain zoning ordinances to identify and enforce where development should not occur.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	Rochester-OC Planning Department, Local City Governments	OC has a 25-year land use plan and a comprehensive plan that guides the physical growth of OC. It contains policies that guides development away from floodplain and flood prone areas. The OC Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence. The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.	County/City Budget
18	Flooding	Local Planning & Regulations	Identify and maintain an inventory (i.e., GIS maps) of roads, bridges, and culverts where flooding has been an issue and identify required mitigation measures to reduce future flood damages.	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC GIS, Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments all work to identify and prioritize transportation improvement projects to address areas that suffer from flood damages.	County/City budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
19	Flooding	Structure and Infrastructure Projects	Implement required flood mitigation measures for roads, bridges, and culverts (i.e., raising roads, installation or modification of culverts, creation of retention areas.)	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island <b>Stewartville</b>	OC Public Works, OC SWCD, and Local City Public Works depts.	The county and city public works / transportation departments and SWCD work to identify and prioritize transportation improvement projects to address flood storage and flow reduction options when bridges and culverts are proposed for replacement.	County/City Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>
22	Flooding	Structure and Infrastructure Projects	Install flood warning gauges on streams in critical areas of the County that can be remotely read and integrated in advance warning systems.	New	Moderate	2017-2021	Olmsted County <b>Stewartville</b>	OC SWCD, OC Public Works & Env. Resources	SWCD, DNR and state climatology office to locate existing gauges and establish new ones into strategic locations that assist with flood modeling and trend analysis. Olmsted County will confer with the local MN DNR hydrologist to determine possible funding (i.e., USGS, DNR, or HSEM).	County Budgets <b>Possible FEMA HMA funding for Localized Flood Reduction Projects</b>

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
23	Flooding	Structure and Infrastructure Projects / Education & Awareness Programs	Identify public properties that experience flood damage and work to implement measures to reduce or eliminate future flood damages as appropriate (i.e., homeowner education on landscaping, green infrastructure, or property acquisition & relocation)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC SWCD & Public Works, Rochester-OC Planning Department	Rochester-OC Planning Department administers shoreland zoning in the county and is working with SWCD on the new State stream buffer requirements. SWCD could also work with Ag producers to identify areas that are eligible for inclusion in a land retirement program where perennial vegetation resilient to flooding could be established.	County Budgets, <b>Possible FEMA HMA funding for Green Infrastructure Activities or Property Acquisition &amp; Relocation</b>
24	Flooding	Local Planning & Regulations / Natural Systems Protection	Continue to update and implement existing plans (i.e., South Zumbro CIP) to help reduce long-term vulnerability of flooding and erosion to key waterways.	New	Moderate	2017-2021	Olmsted County Byron <b>Stewartville</b>	OC SWCD and OC Env. Resources	Identify and prioritize key best management practices through the County Water Plan and future One Watershed, One Plan (1W1P) process that store water on the landscape and reduce peak flows.	County Budgets
27	Flooding	Local Planning & Regulations	Continue participation in the National Flood Insurance Program (NFIP). (Jurisdictions with FEMA-mapped high risk areas.)	New	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
28	Flooding	Local Planning & Regulations	Investigate participation in the NFIP's "Community Rating System" (CRS) that would affect flood insurance rates.	Ongoing	Moderate	2017-2021	Olmsted County Dover Pine Island Oronoco <b>Stewartville</b>	Rochester-Olmsted Planning Dept.	Once new floodplain maps are adopted, OC will review participation in the CRS.	County Budgets
29	Flooding	Local Planning & Regulations	Complete and implement the Digital Flood Insurance Rate Maps (DFIRM) project in OC. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance.	In Progress	High	2017	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	Rochester-Olmsted Planning Dept. and Local City Admin	The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for OC.	County/City Budgets
30	Flooding	Local Planning & Regulations	Map all properties covered by Letters of Map Amendment and Letters of Map Revision. (Those LOMR's that list properties but do not amend the FIRM panel.)	In Progress	High	2017	Olmsted County Dover <b>Stewartville</b>	Rochester-Olmsted Planning Dept.	This is a standing procedure of OC Planning and Zoning.	County Budgets
31	Flooding	Local Planning & Regulations	Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events.	Ongoing	Moderate	2017-2021	Olmsted County Byron Dover Pine Island <b>Stewartville</b>	Rochester-Olmsted Planning Dept., OC Public Works, and OC SWCD	OC Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit. OC will work to coordinate with local cities on this. Effects of not doing so may result in flooding in Rochester.	County Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
32	Flooding	Education & Awareness Programs	Develop educational materials and promote shoreland buffer vegetation Best Management Practices, and monitoring.	Ongoing	Low	2017-2021	Olmsted County Dover Eyota <b>Stewartville</b>	OC SWCD	Recently the State of MN adopted new policies that OC will need to enforce. SWCD is a key player.	County Budgets
34	Flooding	Local Planning & Regulations	Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property.	In Progress	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Pine Island <b>Stewartville</b>	Rochester-Olmsted Planning Dept. and City Admin / Public Works	Land has been purchased (in the City of Eyota) but OC is still discussing options and cost.	County/City Budgets, MN Board of Water and Soil Resources (BWSR), and <b>Possible FEMA HMA Funding for Property Acquisition</b>
40	Wildfire	Education & Awareness Programs	Provide education to the public on the dangers of and prevention of wildfire, particularly during periods of high-risk due to drought and high winds.	Ongoing	High	2017-2021	Olmsted County Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in cooperation with local fire departments	Grass fires in rural areas or agricultural fields are the main concern for “wildland” fires in Olmsted County. OC Emergency Management will use its website, Facebook/Twitter, and news releases to help raise public awareness during periods of wildfire risk.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
41	Wildfire	Education & Awareness Programs / Local Planning & Regulations	Encourage public or private property owners (such as land owners, parks or campgrounds) to incorporate defensible space and fuels reduction around new or existing structures that may be at-risk of wildfire. Incorporate into local building codes as appropriate.	New	High	2017-2021	Olmsted County Byron Pine Island <b>Stewartville</b>	OC Emergency Management, OC Public Works, and local fire depts.	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	<b>Possible FEMA HMGP or PDM funding for Defensible Space or Fuels Reduction</b>
42	Wildfire	Education & Awareness Programs	Continue to educate the public on fire awareness and safety through education and outreach events (i.e. promotion of Fire Prevention Awareness Week education, school visits, and other events at the local level.)	Ongoing	High	2017-2021	Olmsted County Byron Chatfield Eyota Pine Island <b>Stewartville</b>	OC Emergency Management in cooperation with local fire departments	Olmsted County EM will work with other gov't agencies (DNR, Townships, USDA, Fire Depts) to develop informational outreach via Facebook, Twitter, Websites and other community events to reduce the likely hood of Wildfires.	County/City Budgets
43	Drought	Local Planning & Regulations	Develop a section of the emergency response plan for OC that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions.	Ongoing	Low	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in collaboration with local city public works	OC Emergency Management updates its EOP on an annual basis and will continue to address all-hazards in coordination with other key county departments (such as SWCD regarding drought).	County/City Budgets
44	Drought	Local Planning & Regulations	Strengthen water conservation measures in the building code for each jurisdiction by educating the public and contractors.	Ongoing	Moderate	2017-2021	Olmsted County Byron Eyota <b>Stewartville</b>	Rochester-Olmsted Planning Dept.	Local governments will address water conservation measures in scheduled updates for land use and ordinances.	County/City Budgets

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	County/City Comments on Planning Mechanisms for Implementation	Possible Funding
46	Drought	Education & Awareness Programs / Local Planning & Regulations	Promote water conservation measures and fire safety awareness to residents during periods of drought. Enforce water conservation ordinances when needed (i.e., that prohibit watering lawns during drought).	New	High	2017-2021	Olmsted County Byron Chatfield Dover Eyota Oronoco Pine Island <b>Stewartville</b>	OC Emergency Management in collaboration with SWCD and local cities	Promoting water conservation during periods of drought is a standing effort of the County and local governments.	County/City Budgets

Table G - 14. Additional Mitigation Actions Identified for the City of Stewartville for Specific Implementation by the City

#	Hazard	Mitigation Strategy	City of Stewartville Mitigation Action	Status	Priority Ranking	Time-frame	Jurisdictions	Responsibility	City Comments on Planning Mechanisms for Implementation	Possible Funding
1	Severe Winter Storms / Severe Summer Storms	Mitigation Preparedness & Response Support	Acquire generators for critical facilities to provide backup power and continuity of operations in the event of a power outage from severe storms.	New	High	2017-2021	City of Stewartville	City Admin & Public Works	Depending on severity, the City will coordinate clean-up and stabilization issues, and will coordinate with OC Sheriff Dept., any safety and security and emergency power matters.	County/City and Possible State/FEMA Budgets
	Flooding	Local Planning & Regulations	Identify homes in the city that have reoccurring basement flooding and work with homeowners to identify/implement mitigation measures.	Ongoing	High	2017-2021	City of Stewartville	Local City planning and Public Works depts.	Largely still an individual homeowner matter, but the City is working on storm water improvements throughout the city, to help control and mitigate some flooding occurrences.	County/City Budgets
2	Flooding	Structure & Infrastructure Projects	Identify buildings susceptible to flooding near the North Branch of the Root River and evaluate potential mitigation measures such as elevation and green infrastructure (landscaping) to reduce potential flood damages during high rain events.	New	High	2017-2021	City of Stewartville	City Admin & Public Works	Root River's geography keeps it pretty well contained through Stewartville, but the City would help address with flood control sandbagging and levy work if or where needed.	Potentially funded by individual property owners, and City/State/FE MA where warranted.
3	Severe Summer Storms	Mitigation Preparedness & Response Support	Work with City Council and Developers to ensure new warning sirens are obtained for the city as it expands with new development.	New	High	2017-2021	City of Stewartville	City Admin	City Council will evaluate and discuss in coordination with future developers. The City will also seek input from Olmsted County Emergency Management.	Potentially funded by Developer.
4	All-Hazards	Mitigation Preparedness & Response Support	Coordinate emergency response between the City of Stewartville and the Rochester International Airport in the case of airport emergencies through the existing airport emergency operations plan.	New	High	2017-2021	City of Stewartville	City Admin in collaboration with Rochester Int'l Airport Emergency Manager	The City would also utilize OC's Emergency Management Office in coordination of all response efforts.	Airport/City & County/State & FEMA.

Table G - 15. Mitigation Actions Identified for Implementation by Olmsted County Public Schools (2017-2021)

#	Hazard	Mitigation Strategy	Olmsted Public Schools Mitigation Action	Status	Priority Ranking	Time-frame	Public School Districts	Responsibility	Comments on Planning Mechanisms for Implementation	Possible Funding
6	All-Hazards	Mitigation Preparedness & Response Support	Identify critical facilities that do not have backup power in the event of a major power outage. <i>(Critical facilities may include: police/fire departments, EOC, health care facilities, water &amp; sewer treatment facilities, and other facilities deemed as critical, i.e. public schools and sheltering facilities).</i>	New	High	2017-2021	<u>Public Schools:</u> Byron, Dover-Eyota, Stewartville, Pine Island, and Chatfield Jr./Sr. High School	OC Emergency Management, City Admin & Public Works, and School District Staff	School districts will identify schools that do not have or should have generator backup power to support school operations and safety of students & staff in the event of severe winter or summer storms.	School budgets
7	All-Hazards	Mitigation Preparedness & Response Support	Purchase and install generators or related equipment (e.g., generator hook-ups) for identified critical facilities that require backup power.	New	High	2017-2021	<u>Public Schools:</u> Byron, Dover-Eyota, Stewartville, Pine Island, and Chatfield Jr./Sr. High School	OC Emergency Management, City Admin & Public Works, and School District Staff	School districts will evaluate feasibility to purchase and install generators for key facilities where backup power is considered critical. <i>School districts must have adopted the Olmsted County MHMP in order to be able to apply directly to FEMA for mitigation grant funds for a generator project.</i>	School Budgets, possible support from city funding, and <b>Possible FEMA HMA 5% Initiative for Generators</b>
8	Severe Winter Storms / Summer Storms	Education & Awareness Programs	Promote the National Weather Service’s annual Winter Weather Awareness Week in the fall and Severe Weather Awareness Week in the spring.	New	High	2017-2021	<u>Public Schools:</u> Byron, Dover-Eyota, Stewartville, Pine Island, and Chatfield Jr./Sr. High School	OC Emergency Management and Public Health, OC Communications Director, and School District Staff	School Districts will work with Olmsted County Emergency Management to share information from the NWS’s annual winter and spring severe weather awareness week information with students & staff.	County/City/ School budgets

#	Hazard	Mitigation Strategy	Olmsted Public Schools Mitigation Action	Status	Priority Ranking	Time-frame	Public School Districts	Responsibility	Comments on Planning Mechanisms for Implementation	Possible Funding
10	Severe Summer Storms	Structure and Infrastructure Projects	Identify areas where vulnerable populations are susceptible to tornadoes or extreme wind events (i.e. schools, campgrounds, or mobile home parks) and evaluate for construction or retrofit of safe rooms or storm shelters.	New	High	2017-2021	<u>Public Schools:</u> Byron, Dover-Eyota, Stewartville, Pine Island, and Chatfield Jr./Sr. High School	OC Emergency Management, and School District Staff	School districts will work with Olmsted County Emergency Management to evaluate any particular schools may be a good fit for construction or retrofit of a safe room for the school to help protect students, staff, and the community during extreme wind events such as tornadoes and straight-line winds. Safe room construction or retrofit may fall into plans for dual-use of a facility (i.e, additional gym built to safe room technical specifications).	County/City/ School budgets
11	Severe Summer Storms	Structure and Infrastructure Projects	Implement construction or retrofit projects for safe rooms or storm shelters in identified vulnerable locations.	New	High	2017-2021	<u>Public Schools:</u> Byron, Dover-Eyota, Stewartville, Pine Island, and Chatfield Jr./Sr. High School	OC Emergency Management in coordination with participating city or school	School districts must have adopted the Olmsted County MHMP in order to be able to apply directly to FEMA for mitigation grant funds for a safe room project.	County/City/ School budgets <b>Possible FEMA HMA funding for Safe Room Construction</b>

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# **Appendix H**

## **Past Mitigation Action Review**

### **Status Report (2009-2016)**

## Olmsted County – Past Mitigation Action Review Status Report (2009-2016)

Following is a report on the status of each of the mitigation actions that were included in the 2009 Olmsted County multi-hazard mitigation plan. This report meets the following FEMA crosswalk requirement:

**D2. Was the plan revised to reflect progress in local mitigation efforts? (44 CFR 201.6 (d)(3))**

The plan **must** describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan **must** either describe whether the action is no longer relevant or be included as part of the updated action plan.

### **COMPLETED**

The following mitigation actions from the past MHMP have been completed and will be removed from the plan update.

- (All Hazards) Examine alternative methods and technology to allow direct notification of citizens in the event of an emergency (City-Watch, Code Red, Reverse 911, or federal systems). *(Rochester Alert, Reverse 911, IPAWS, Media, Social Media)*
- (All Hazards) Address communications coordination for Chatfield and Pine Island, the two cities split by county boundaries, in the updated Emergency Operations Plan. Coordinate with Goodhue and Fillmore Counties. *(Olmsted County has direct communication with Goodhue County and Fillmore County in reference all hazard mitigations within Pine Island and Chatfield.)*
- (Extreme Temperatures) Ensure that the emergency response plan for Olmsted County includes response actions for both winter and summer events. Include the identification of vulnerable populations and location in the county. *(Olmsted County no longer are using cooling centers. The warming/cooling centers are now run by non-profit organizations in Rochester and they will open a warming center for the homeless if needed. No county employees can work there and only volunteers. Olmsted County Public Health does have plans in place.)*
- (Flooding) Improve communications between units of government to control travel on transportation routes during major floods. *(Plans are written in reference to the transportation during floods.)*
- (Flooding) Encourage all cities to develop stormwater management plans. *(There are plans in place that reference the stormwater management.)*
- (Flooding) Investigate conducting watershed level stormwater management plans. Identification of Best Management Practices and projects that reduce flood flows would be a primary goal of the plan. *(This has been completed and is in the stormwater management plan.)*
- (Violent Storms) Determine if there is an effective warning system (sirens) for violent storms in each area of the county. Make investments in the warning system if gaps are found. *(The outdoor warning system is tested weekly and maintenance is done as soon as possible when needed. Weekly page tests are done. Reverse 911 is also tested by Olmsted County/City of Rochester dispatch center.)*
- (Violent Storms) Increase the number of warning sirens within the City of Byron from one to four due to city growth and expansion beyond current coverage. *(When the plan was implemented, there*

*were a total of two outdoor warning sirens in the City of Byron. Today, there are a total of four outdoor warning sirens within the City of Byron.)*

- (Violent Storms) Conduct an inventory of storm shelters in the county and determine where additional facilities are needed. Construct storm shelters in identified areas (such as, public gathering locations). *(This was completed by the City of Rochester. Olmsted County will no longer participate in this portion.)*
- (Violent Storms) Develop storm debris management guidelines for the county. Make sure it is a part of the emergency response plan. *(Policies and procedures are already written in reference to debris management and how Olmsted County Public Works will respond.)*
- (Violent Storms) Develop a facility for motor fuel dispensing during power outages for emergency responder and other public vehicles. *(This is completed. The City of Rochester Public Works Buildings are equipped with the dispensing devices.)*
- (Violent Storms) Develop alternative methods of providing emergency power to city facilities including wells and controls during outages; generator; emergency bypass pump. *(All Olmsted County facilities are generator ready. There are generators available to bring in and hook up if needed. The Olmsted County EOC is fully equipped with generator and UPS backup.)*

#### **NOT COMPLETED (DELETE)**

**The following mitigation actions from the past MHMP have been deemed as not relevant and will be removed from the plan update.**

- (All Hazards) - Complete the gap analysis for all hazards listed in the plan and others identified by the HSEM Policy Committee. *(This will be accomplished with the new MHMP.)*
- (All Hazards) Develop a program directed to the population in the county that is vulnerable to hazards due to language barriers. The City of Rochester is developing a program with the immigrant community to address the need for improved communications in local emergencies. *(Olmsted County has a very limited population of the immigrant community outside of the City of Rochester. Olmsted County would use ECHO Minnesota to communicate with the immigrant community as needed).*
- (All Hazards) Develop and distribute emergency response information for visitors to Rochester. Distribution could be through the Convention and Visitors Bureau and Amateur Sports Commission. *(Delete, in the City of Rochester).*
- (Drought) Encourage each city to develop a drought response plan for their city water system. (The City of Rochester has developed a plan –DNR Water Emergency and Conservation Plan). *(The drought response procedures are mitigated through the City of Rochester.)*
- (Drought) Develop a countywide program for the use of Stormwater best management practices that includes the use native plant species, stormwater capture and other measures by public agencies and the private sector. *(It is already written in the stormwater management plan. Statistics are sent to the National Weather Service as well.)*

- (Extreme Temperatures) Investigate requiring the development of a response plan for all feedlot owners/operators for feedlots of 500 or more animal units. (regulation applied to all feedlots) *(No written plans in place because it is up to each individual owner/operator on a permit level per the MPCA. It is monitored through the MPCA.)*
- (Flooding) Improve monitoring of the reservoirs and watersheds in the county during severe storms and flood events. *(The County does not have anything to do with the reservoirs, the City of Rochester does.)*
- (Flooding) Conduct an inventory and identify the highest risk streambank/waterbody shoreline erosion areas. Determine measures needed to mitigate property damage. *(Nothing has been done - and nothing is likely to be done by Olmsted County Public Works in the future.)*
- (Flooding) Study recent climate change impacts on storm events and flood frequency and inundation. Amend the storm water management plan for Rochester to reflect these changes. *(Delete, in the City of Rochester).*
- (Flooding) Continue to provide resources for the Rochester stormwater program for educational materials and the use of Best Management Practices. *(Delete, in the City of Rochester).*
- (Flooding) Implement the capital improvements identified by the City of Rochester that will mitigate flood and stormwater impacts and stabilize facilities and stream/river channels. *(Delete, in the City of Rochester).*
- (Violent Storms) Maintain and update the safe shelter plan for residents of manufactured home and recreational vehicle parks, and campgrounds in the county. *(Olmsted County currently does not have a shelter plan in place. Recreational vehicle parks and campgrounds in the county will be expected to evacuate.)*
- (Violent Storms) Investigate requiring the incorporation into the feedlot permit of a response plan for all feedlot owners/operators for feedlots of 500 or more animal units. (determine adequate power backup). *(No written plans in place because it is up to each individual owner/operator on a permit level per the MPCA. It is monitored through the MPCA).*
- (Violent Storms) Conduct an inventory of roadways in Olmsted County that regularly experience travel problems during blizzard conditions. The purpose would be to determine where to construct "living snow fence". *(There are no consistent roads with this issue and there are not enough blizzards in the area.)*
- (Violent Storms) Investigate burying of existing power lines within city limits. The focus would be in the older neighborhoods. *(Delete, in the City of Rochester).*
- (Wildfire) Identify and collect existing information or develop information for distribution to rural residents/property owners. *(Goes along with a mitigation action we are keeping ("Investigate the need for an education program for the public regarding the dangers/prevention of wildfires.") We also do not get enough of these in or around the county.)*

- (Dam Failure) Update the emergency response plan for each flood control reservoir to reflect changes in the watershed and changes in climate. *(Olmsted County does not regulate the Dams, the MNDNR is responsible for this).*
- (Dam Failure) Develop/adopt floodplain policies for lands located downgradient of all flood control reservoirs that address dam breach. *(These policies should be applied at the state level by the MNDNR.)*

### **NOT COMPLETED (ONGOING/KEEP FOR PLAN UPDATE)**

The following mitigation actions from the past MHMP have not been completed, have been deemed as still relevant and will be carried over into the plan update. Actions will be revised as necessary.

- (All Hazards) Encourage all communities within Olmsted County to address natural hazards in their comprehensive plans. (Each city will need to utilize information from the plan during plan updates over the next five years. The Olmsted HSEM and ROPD will be available to provide assistance where requested.) *(This will be adopted as part of the City of Rochester comp plan. Comp plans for Byron, Chatfield, and Pine Island do not address natural hazards. The other cities do not have comp plans.)*
- (All Hazards) Conduct a climate change vulnerability assessment and apply the knowledge to this plan and all other community comprehensive plan elements. *(Olmsted County does not have this done yet, but it should be kept in the plan. The work that the MN Department of Health has done will be useful to this project.)*
- (All Hazards) All cities and Olmsted County develop an energy element to their comprehensive plans that identifies vulnerabilities and strategies to address changes in energy resources. *(Keep- In talking with Olmsted County staff members working on this plan, the information listed in this mitigation strategy is not within the scope of the Energy Action Plan. This is something that should be done, though, particularly as the State's 2030 energy goals are approaching. The mitigation strategies will be addressed for wind farms, solar gardens, etc.)*
- (All Hazards) Redesign the existing web page on the Olmsted County website to include the hazard plan, resources, and information on emergency preparedness. *(The Olmsted County website is always changing.)*
- (All Hazards) Coordinate emergency response between the City of Stewartville and the Rochester International Airport in the case of airport emergencies through the existing airport emergency operations plan. *(Changes are occurring all the time on response procedures and Stewartville fire will be under the direction of Rochester Fire Department.)*
- (All Hazards) Continue to collect and update critical data of use during an emergency and develop the means for inclusion in the Emergency Operations Plan. *(Changes all of the time.)*
- (Drought) Develop a section of the emergency response plan for Olmsted County that covers severe drought. The plan should address all community water systems and shared wells in suburban subdivisions. *(Olmsted County monitors reservoirs, and if the County should run into a drought, the reservoirs could be let out to use the water to mitigate the drought - 7 total in our county.)*

- (Drought) Enforce water conservation measures in the building code for each jurisdiction by educating the public and contractors. *(Keep as is for ongoing implementation.)*
- (Drought) Encourage the development of a response plan that addresses the needs of agriculture during a severe drought. *(Olmsted County is working with the USDA Farm Service Agents and Soil and Water divisions.)*
- (Extreme Temperatures) Encourage communities to study the use of vegetation for reducing the impacts of extreme temperatures including tree planting and windbreak development. *(This would be good to keep for Olmsted County as the "heat island" effect could impact the small cities, particularly as they expand into farmland with little to no tree cover. Trees also help tremendously with storm water management.)*
- (Extreme Temperatures) Identify and map the locations of all vulnerable populations for emergency response, and develop a communications plan to notify vulnerable populations. *(Olmsted County has identified this as a big need for the City of Rochester's AHMP and as part of the community engagement process met with many vulnerable population groups. This needs to stay in as the Olmsted County will be dealing with this as well.)*
- (Flooding) Investigate participation in the Community Rating System (CRS) that would affect flood insurance rates. *(The MNDNR is recommending Olmsted County consider participating. Olmsted County will follow-up with the MNDNR once a new floodplain maps adopted.)*
- (Flooding) Conduct an inventory and identify the highest risk roads/bridges for flooding in the county. Determine what measures to improve safety on those roads/bridges. *(Olmsted County plans to review past history of flooding to help determine best routes when flooding occurs.)*
- (Flooding) Complete and implement the DFIRM project in Olmsted County. Each community will need to adopt the revised floodplain maps. Each community will need to update their floodplain ordinance. *(Olmsted County is still waiting for the revised maps from FEMA. FIRM maps should be forthcoming from FEMA in August or this fall. Each community in Olmsted County has 6 months to adopt the maps.)*
- (Flooding) Map all properties covered by Letters of Map Amendment and Letters of Map Revision (those LOMR's that list properties but do not amend the FIRM panel). *(Olmsted County does this all of the time and this might be a standing procedure.)*
- (Flooding) Examine the use of Low Impact Development (LID) techniques in road and development projects to more effectively manage stormwater runoff during heavy rain events. *(Olmsted County Public Works continues to use standard practices in its roadway design. The standard continues to change with updates to the NPDES permit.)*
- (Flooding) Develop educational materials and promote shoreland buffer vegetation Best Management Practices, and monitoring. *(Particularly since the State just adopted some new policies that Olmsted County will need to enforce. SWCD a key player.)*
- (Flooding) Conduct a study of areas in cities that have reoccurring basement flooding and develop mitigation strategies. Identify measures to limit infiltration to the Dover and Eyota portions of the

Dover/Eyota/St. Charles sewer system. *(The City of Eyota is in phase 2 of 3 in having all concrete curbs, gutters, and larger storm drains. There is still flooding in the City of Eyota and in houses but they are working on it.)*

- (Flooding) Through land acquisition, develop stormwater control structures to retain and slow the flow of surface water runoff, preventing flooding damage to private and public property in Eyota. *(Land has been purchased but Olmsted County is still discussing options and cost.)*
- (Landslides/Karst) Develop a model ordinance for use in every community in the county that will minimize disturbance and avoid the development of certain areas that are unstable due to soils and/or geologic formation. *(Olmsted County has not started this project but it has been discussed.)*
- (Landslides/Karst) Conduct a study of unstable slopes and an inventory of areas in the county. Develop a plan to address unstable slopes particularly near public roads and other critical facilities. *(The study is ever changing with the development of Olmsted County. There are plans in place to address unstable slopes.)*
- (Landslides/Karst) Create new standards in the Olmsted County Zoning Ordinance to address karst features and protection of the groundwater system in the county. *(This has been started but not completed.)*
- (Violent Storms) Study incorporating storm shelter regulations in each community's code of ordinances. *(This study has begun as some parks have FEMA approved safe rooms but the smaller towns do not.)*
- (Violent Storms) Study the need for communications backup and auxiliary power generators in all school buildings in the county. (in case of electrical or other failures). *(Schools in Byron: The elementary and the new primary building have gas powered generators that will support life safety systems, the high school has 5 inverters for backup power, the Community Education Center has one inverter for backup power, the Middle School does not have an inverter or generator. Schools in Eyota: do not have any but it is a work in progress. Schools in Pine Island: Pine Island Schools do not have generators. The only thing they have is battery emergency lighting and a battery backup weather monitor.)*
- (Violent Storms) Encourage more individuals to become volunteers active in the severe storm network. (Storm Spotters). *(We promote the Storm Spotters program every year. All of the Cities in Olmsted County participate in the Storm Spotter training each year.)*
- (Wildfire) Investigate the need for an education program for the public regarding the dangers/prevention of wildfires. *(The education of the citizens in Olmsted County will continue and constantly change.)*

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# Appendix I

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# Appendix J

## Olmsted County Plans & Programs in Place

*Planning & Regulatory*

<i>Plans/Programs</i>	<i>Yes/No</i>
Comprehensive/Master Plan	Yes
Capital Improvements Plan	Yes
Economic Development Plan	Yes
Emergency Operations Plan	Yes
Continuity of Operations Plan	Yes
Transportation Plan	Yes
Stormwater Management Plan	Yes
Community Wildfire Protection Plan	No
FireWise Program	No
Water Conservation/Emergency Preparedness Plan	Yes
Wellhead Protection Plan	Yes
Database of dry hydrants/well access	Yes
Burning permits/restrictions	Yes
Water Management Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Floodplain ordinance	Yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes to some
Flood insurance rate maps	Yes
Acquisition of land for open space and public recreation uses	Yes
School closing policy/communications plan in event of inclement weather/temperatures	Yes
Storm shelters (list all locations)	Yes (see below)
Warning sirens (list all locations)	Yes (see below)
SKYWARN Program	Yes
CodeRED Mass Notification System	Yes (Rochester Alert)
Severe Weather Awareness Week	Yes
Winter Weather Awareness Week	Yes
NOAA Weather Radios	Yes
THIRA	Yes

*Administrative & Technical*

<i>Administration</i>	<i>Yes/No</i>
Planning Commission	Yes
Mitigation Planning Committee	No
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Yes
Mutual aid agreements	Yes
<i>Staff</i>	<i>Yes/No</i>
Chief Building Official	Yes
Floodplain Administrator	Yes
Emergency Manager	Yes
Community Planner	Yes
Civil Engineer	Yes
GIS Coordinator	Yes
<i>Technical</i>	
Warning systems/services (Reverse 911, outdoor warning signals)	Yes
Hazard data and information	No
Hazus analysis	No

*Education & Outreach*

<i>Program/Organization</i>	<i>Yes/No</i>
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
Natural disaster or safety related school programs	Yes
StormReady certification	Some
Firewise Communities certification	No
Public-private partnership initiatives addressing disaster-related issues	Yes

### Olmsted County List of Warning Siren Locations (2016)

1. 10<sup>th</sup> Ave and 2<sup>nd</sup> St NE Rochester
2. Woodridge and Summit St NE
3. 35 Ave and Viola Rd NE Rochester
4. 10<sup>th</sup> Ave and 1<sup>st</sup> St SE Rochester
5. 3<sup>rd</sup> Ave and 16<sup>th</sup> St SE Rochester
6. 17<sup>th</sup> and Marion Rd SE Rochester
7. 36<sup>th</sup> Ave and College View Rd SE
8. 11<sup>th</sup> Ave and 26<sup>th</sup> St SE Rochester
9. Marion Rd and Kalhoun Ct SE
10. 6<sup>th</sup> St SW and Broadway
11. 16<sup>th</sup> St and Hwy 52 SW Rochester
12. 23<sup>rd</sup> Ave and Gates Dr SW Rochester
13. 5<sup>th</sup> Ave and 23<sup>rd</sup> St SW Rochester
14. 10<sup>th</sup> Ave and 38<sup>th</sup> St SW Rochester
15. Mayo Hills Dr and Abigail Ct SW
16. Meadowridge and Oakwood SW
17. 11<sup>th</sup> Ave and 10<sup>th</sup> St NW Rochester
18. 36<sup>th</sup> Ave and 6<sup>th</sup> St NW Rochester
19. 26<sup>th</sup> St and Highway 52 N Rochester
20. 41<sup>st</sup> St and Hwy 52 N Rochester
21. Fairway and Chesapeake NW
22. 13<sup>th</sup> Ave and 48<sup>th</sup> St NW Rochester
23. 37 1/2 St at Zumbro Dr NW Rochester
24. 16<sup>th</sup> Ave and 65<sup>th</sup> St NW Rochester
25. 6<sup>th</sup> Ave and NW at Central Lutheran
26. Valley Dr and NW CC Manor Rochester
27. 7<sup>th</sup> St and 10<sup>th</sup> Ave SW Rochester
28. 11<sup>th</sup> Ave and 8<sup>th</sup> St SE Rochester
29. 14<sup>th</sup> St and 8<sup>th</sup> Ave NE Rochester
30. Sunset Terrace School NW
31. 11<sup>th</sup> Ave and South point Dr Rochester
32. Co Rd 2 and Co Rd 22 NE Rochester
33. 2<sup>nd</sup> Ave and 8<sup>th</sup> St NW Rochester
34. Historic Dr and Co Rd 122 SW
35. 25<sup>th</sup> Ave and 55<sup>th</sup> Street NW Rochester
36. St Mary's Dr and Harvest Ave SW
37. 37<sup>th</sup> St NW and Gage School
38. Nicolas Dr and 55<sup>th</sup> St NW
39. Zumbro Dr and 4<sup>th</sup> Ave NW

40. Supeor Dr and 26<sup>th</sup> St NW
41. Mayo Baseball Parking Lot
42. Marion rd and Burr Oak School
43. Helgerson Dr and Airport
44. 3<sup>rd</sup> Ave and 4<sup>th</sup> St NE Byron
45. 4<sup>th</sup> Ave and 7<sup>th</sup> St NW Byron
46. Oxbow Park Camping Area
47. 1<sup>st</sup> St and 1<sup>st</sup> Ave NW Oronoco
48. 7<sup>th</sup> St and 7<sup>th</sup> Ave SW Oronoco
49. 2<sup>nd</sup> St and 2<sup>nd</sup> Ave SE Stewartville
50. 4<sup>th</sup> St and Berg St SE Stewartville
51. 20<sup>th</sup> St at Cardinal Ln NW Stewartville
52. 5<sup>th</sup> St and Jefferson Ave W Eyota
53. Chester Woods Park Camping Area
54. Fire Hall Parking lot Dover
55. New Haven Town Hall
56. Weststone Dr and Canyon Dr Eyota
57. 3200 18<sup>th</sup> Ave NW Rochester
58. URC Pkwy (Ball Fields)
59. Cedar Dr and Cedar Point Rd
60. 1325 Riverwood Dr Oronoco
61. Bush park Eyota
62. Lionhart and Loyd
63. KOA Marion
64. Eyota Fire Hall
65. 6600 10<sup>th</sup> St SE Chester
66. Byron High School
67. Chatfield Elementary
68. 5123 Scenic Oak Dr SW
69. 4390 Saint Bridget Rd SE
70. 3213 Harbor Heights Ct SE
71. 6380 Fairway Dr NW
72. 3977 Whiting Ln NE
73. 4327 Red Hawk Dr SE
74. 3519 Odyssey Dr SW
75. Oronoco Estates
76. 1291 7<sup>th</sup> St NE Byron
77. 213 5<sup>th</sup> St Chatfield
78. Juniper Rd and 330<sup>th</sup> St Chatfield
79. 761 Burr Oak Ave Chatfield
80. Prairie View Dr NE Pine Island

81. 420 3<sup>rd</sup> Ave NW Pine Island
82. 300 Main St Pine Island
83. 1900 8<sup>th</sup> St SE Pine Island
84. 10<sup>th</sup> St NW and 8<sup>th</sup> Ave NW Pine Island
85. 2872 Peterson Ln SE Rochester
86. 6<sup>th</sup> St SE and East Frontage Rd Rochester
87. McQuillan Field Rochester
88. Bear Cave Park
89. Meadow Park
90. Quarry Hill
91. Pine Island public Works

**Olmsted County List of Storm Shelters:**

- Oronoco Estates – Located in in the trailer park as soon as you drive in off of 85<sup>th</sup> St NW.
- Sistas Trailer Park – Located in the trailer park off 5<sup>th</sup> St SE.
- Southern Hills – There are 2 storm shelters located in the trailer park. 1 is located off 23<sup>rd</sup> Ave and the other is located off 21<sup>st</sup> St near the pool.
- Zumbro Ridge – Located in the trailer park as soon as you drive in from 55<sup>th</sup> St NE.
- Hallmark Terrace – Located in the trailer park.
- Chester Woods Park and Oxbow Park – Concrete bathrooms are used for storm shelters.

# **Appendix K**

## **Local Mitigation Capabilities**

### **Assessment Report**

# OLMSTED COUNTY

## 2017 Local Mitigation Capabilities Assessment Report

As part of the 2017 Olmsted County Multi-Hazard Mitigation Plan update, city and township jurisdictions as well as County departments were invited to respond to a “Local Mitigation Capabilities Assessment” (LMCA) questionnaire to provide information about the current capabilities they have in place to support hazard mitigation, as well as any identified gaps or deficiencies. Information from the LMCAs was used to assist in developing new mitigation actions for the 2017 plan update. Following are the responses from those departments or jurisdictions that participated.

### ROCHESTER/OLMSTED COUNTY PLANNING DEPARTMENT (ROPD)

*Submitted By: Sandi Goslee, Principal Planner, on behalf of the ROPD*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- Olmsted County has a 25-year land use plan and a comprehensive plan that guides the physical growth of Olmsted County. It contains policies that guides development away from floodplain and flood prone areas. The County’s current hazard mitigation plan was adopted as part of the Comprehensive Plan.
- The County participates in the NFIP.
- The Rochester Olmsted Council of Governments (ROCOG) has reaffirmed the 2040 Long Range Transportation Plan that covers the Olmsted County area. This plan is federally required to be compared to available state or local conservation plans, maps and inventories for purposes of assessing potential areas of impact early in the planning process. As such, it keeps such things as floodplains, steep slopes, and erodible soils in mind when planning for the area’s transportation network. It is updated every five years.
- The Olmsted County Zoning Ordinance regulates development in the floodway, floodplain, and flood prone areas as well as shorelands and those areas prone to erosion and land subsidence.
- Olmsted County has adopted a Decorah Edge ordinance that regulates development in these sensitive recharge areas.
- The Rochester-Olmsted Planning Department also enforces the subdivision ordinance, building code, and well and septic ordinances.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The Rochester-Olmsted Planning Department’s GIS Division produces and maintains the County’s GIS database as well as stores GIS data produced by other agencies at the local, state, and federal levels. These datasets are available to County staff through use of ESRI’s ArcGIS software as well as to other agencies and the general public through an online mapping portal.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The County participates in the NFIP. New Flood Insurance Rate Maps have been completed for Olmsted County.
- A number of the reservoirs that retain water for the City of Rochester's flood control project are located outside of the city limits. Those areas of Olmsted County, therefore, are also receiving flood protection as part of that stormwater program and are subject to zoning restrictions in those areas.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Rochester-Olmsted Planning Department does get technical assistance from state agencies with regard to flood programs.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Need to create standards in the county zoning ordinance that address development near karst features as they impact groundwater resources.

**OLMSTED COUNTY SOIL AND WATER CONSERVATION DISTRICT**

*Submitted By: Skip Langer, Olmsted SWCD Director & Martin Larsen, Olmsted SWCD Feedlot Technician*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- In the past, after flooding events and under a disaster declaration, the SWCD has had access to state funding to assist landowners with repair of best management practices (BMP's) damaged by heavy storm events.
- All large animal feedlots must maintain emergency response plans for mitigation of spills, leaks or facility failures.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The SWCD has 5 staff who can assist landowners with evaluation, technical assistance and implementation in response to any required emergency situation or mitigation.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- One on one assistance to animal feedlot operators with development of emergency response plans as dictated by the permitting process.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The SWCD has worked with state and federal partners to address mitigation efforts following past disaster events such as the 2007 and 2010 severe flooding events.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Delays in access to funding resources for landowners

**CITY OF BYRON, MN**

*Submitted By: Mary Blair-Hoeft, City Administrator*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a 20-year Comprehensive Plan (2011) that is designed to plan for the future physical growth of the city and appropriate land uses.
- We have a Planning & Zoning Committee that evaluates land use requests.
- We have an annual transportation plan to address road improvement projects that include culvert and drainage improvements.
- The City has a maintenance plan for jetting our storm sewer lines every three years.
- We have a maintenance policy to clean culverts and ditches bi-annually.
- We have regional detention ponds that we evaluate for maintenance on an annual basis.
- The City has an Emergency Management Handbook that has been prepared and approved.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City is a member of MnWarn, which allows for sharing of equipment and resources.
- City staff participates in safety meetings.
- The City's Emergency Manager has recently stepped down so we are in transition; the spot is being filled by the City Administrator and the Fire Chief.
- The City uses its contracted engineer for GIS services. We are training and have downloaded the GIS software in-house.

- We have City staff and consultants that evaluate the road maintenance issues and storm water pond issues.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Our school practices tornado drills on an annual basis.
- The City participates in the annual Severe Winter/Spring Weather Awareness Week
- The City has installed sirens to provide a warning system to all residents.
- The City reviews with staff on an annual basis our storm drills and meeting locations.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has participated with FEMA to mitigate possible disaster issues.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The City needs additional funding to provide the resources and time needed to accomplish or prepare for a disaster.

**CITY OF CHATFIELD, MN**

*Submitted By: Dan Jaquith, Emergency Manager*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- City of Chatfield has a comprehensive land usage plan in place. The city superintendent for city streets has a plan that address street maintenance including culvert and over the road flooding.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Chatfield has a progressive and proactive city council and also has a Safety committee that meets monthly. All department from the city are represented at all safety meetings

**Q3. What programs are in place to help accomplish mitigation in your community?**

- City of Chatfield works with Olmsted County in regards to emergency weather alerts and the sounds of outdoor sirens. Chatfield fire department is the cities storm spotters and has a dedicated plan in place when and if needed.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City of Chatfield looks toward, county, state, and federal for additional funds.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The mobile home park storm shelter would need some improvements to bring it up to standards.
- The EOC is in need of funding to help improve our technological needs.

**CITY OF EYOTA, MN**

*Submitted By: Tony Nelson, Emergency Manager*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The City of Eyota currently has a Land Comprehensive Plan which was last updated in 2014.
- The City of Eyota works with Olmsted County Soil and Water District and our City Engineer, (WHKS) to set up and address the need to improve flood water management plan in regards to culvert replacement and the development of wetland improvements within the City of Eyota.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City of Eyota currently has an Emergency Manager (Council Member) and a Deputy Director (Fire Safety Chief from the Fire Department).
- The City of Eyota Public Works Supervisor works with our contracted City Engineer (WHKS) to address roads, streets and culverts in town and in the past 5 years have a comprehensive plan to address issue of flooding within the City of Eyota.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City of Eyota within the last year has become a part of an emergency alert system, Rochester Alert. Citizens were notified of this new alert system through social media, new letter, city website and community channel on TV.

- The fire department and ambulance service participate in severe weather awareness week.
- The City of Eyota provides citizens with Weather Awareness through Social Media (Facebook) and the Local TV Channel designated to the City of Eyota.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City of Eyota has worked with Olmsted County, the State of Minnesota and FEMA to help address issues after the flooding of 2007.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The mobile home park in town has not met storm shelter requirements set by MDH.
- Also rules that are in place by the State of Minnesota Department of Natural Resources does not allow us to clean up the creek that goes through our city to help in flood control. Examples include: Digging out silt, and cutting downed trees that backup water.

**CITY OF ORONOCO, MN**

*Submitted By: Pat McGovern, EOC*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We follow the Olmsted County mitigation plan from 2009, adopted by the city in 2010.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Oronoco has a part time city engineer and we have two full time maintenance workers.
- We also have a volunteer fire department with 22 members and a volunteer first responder organization with 16 members.
- Fire Chief is Dan Sundt and we have two assistant chiefs.
- We do have a separate EOC director.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Residents can sign up for the county emergency alert system.
- The city does participate in the National Severe Weather awareness week each spring and there is also an open house for all residents during National Fire Prevention week teaching about fire safety.

- Oronoco Fire does a free CO detector give away, where the fire department comes to your home and installs a detector for all Oronoco residents.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The city in the past has worked with the county and FEMA after a flood in 2010.
- We also have an Emergency Operations Booklet that lists several local volunteers in our community that have and would help the community in a time of need.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Currently, none are identified for the City of Oronoco. Our emergency plan is updated every few years with the help of fire department volunteers.
- EOC has a small budget that is used mainly to purchase equipment for emergency use, generators, pumps, chainsaws, etc.

**CITY OF PINE ISLAND, MN**

*Submitted By: David Todd, City Administrator*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- Pine Island has a 10-year Comprehensive Plan that deals with future growth and land use for the City.
- Pine Island has a Planning and Zoning Commission and an established flood plain ordinance. The city also participates in the National Flood Insurance Plan (NFIP).
- Pine Island contracts with Widseth Smith Nolting Civil Engineers who have designed a 5-year road infrastructure plan for streets that include culvert and draining issues where appropriate to reduce road flooding.
- The City has one mobile home park that is included in an evacuation plan in accordance with Minnesota Department of Health Standards in times of severe weather events.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City of Pine Island contracts our law enforcement services with the Goodhue County Sheriff's Office who participates in hazard mitigation with Pine Island Fire, the City Administrator, and Public Works staff, including Civil Defense.
- Pine Island Civil Defense Director is the designated Emergency Manager

- The City contracts WSN engineering for GIS services.
- Pine Island has a contracted City Engineer and a Public Works Director who addresses road maintenance issues for flooding.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The City has an emergency alert system and publishes information to the Channel 7 programming as well as to the City's web page.
- Pine Island participates in the annual Severe Winter/Spring Weather Awareness Week.
- Pine Island ISD 255 practices tornado drills on an annual basis.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The City has worked with state and federal partners such as SEMA and FEMA to address mitigation efforts following past disaster events such as the 2010 flood.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The City is working on addressing funding gaps for water/sanitary sewer/storm sewer infrastructure upgrades by establishing a rate structure that would help offset costs.
- The City is keeping the Hazard Mitigation Plans updated and available for all entities who participate in severe weather events and disasters.

**CITY OF STEWARTVILLE, MN**

Submitted By: Bill Schimmel, Jr., City Administrator

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The city uses a 10-Year Comprehensive Plan as a land growth and use guideline, (last revised 2010) that assists with planning and zoning.
- The city also has a Planning and Zoning Commission.
- A Floodplain Ordinance is in place, due to the city's proximity with the Root River. The city also is part of the National Flood Insurance Program.
- The city uses a capital improvements plan for reviewing street and infrastructure use and future planning. The city also references Olmsted County's Highway Safety Plan as a guide as well.
- The city has an Emergency Management Plan (last reviewed 2013).
- The city is a member of MnWARN (a statewide agency response network).

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The City Council.
- City Public Safety Committee.
- Olmsted County Emergency Operations Center & Staff.
- The City Administrator, Fire Chief, Public Works Director all serve as Co- Emergency Managers.
- The city has a City Engineer to assist with infrastructure planning and emergency response too.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The city participates with Olmsted County in various emergency testing's and trainings.
- The city works with local school district on emergency and evacuation drills.
- The city has a Civil Defense Siren System with Olmsted County.
- The city has an Emergency Alert System (phone, text, or e-mail) with Olmsted County.
- The city's Fire Department conducts emergency response and prevention trainings for the community.
- The city has website information help.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- Most funding capabilities come from the city's annual general or enterprise planning budgets.
- The city utilizes MN & FEDERAL funding when or if available.
- The city applies for grant funding if or when available.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- The city is finding that increased laws and regulations, along with growth and development is bringing about more frequent reviews of procedures, as well as, bringing about a need for more budgeted dollars due to these increases.
- Adequate and/or appropriate security measures may need to be considered for water and wastewater treatment infrastructure.
- Additional equipment and facility and possible personnel needs are foreseen to go along with this growth and development.

**NEW HAVEN TOWNSHIP**

*Submitted By:* Ann Fahy-Gust

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a Planning and Zoning Commission that has established a Floodplain Ordinance. The City participates in the National Flood Insurance Program (NFIP). We follow FEMA maps and regulations
- We have an annual transportation plan to address road improvement projects that include culvert and drainage improvements to reduce over-the-road repetitive flooding.
- We have a Comprehensive plan that links to Pine Island and to Olmsted County.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- We have a designated emergency response township supervisor. He/She has the ability to close roads, respond to Sheriff requests without town board meetings
- Our road contractor is on call at all times and can respond to emergencies.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- We share Pine Island City's fire department and they do regular education exercises for all communities they serve.
- We do our own burning permits and ensure that residents understand their responsibilities during burning.
- The school located in our township and part of the Pine Island Public Schools practices tornado drills and lock down drills on an annual basis.
- Our website has flood awareness messaging.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The Township has worked with state and federal partners to address mitigation efforts following past flooding events like what was experienced in 2008 and 2010.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We need to review our Comprehensive Plan to address changes in flooding patterns that are being noted in new FEMA maps due out in April.

**ORONOCO TOWNSHIP**

*Submitted By: Mark Thein, Chairman*

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have an annual transportation plan to address road improvement projects that include culvert and drainage improvements to reduce over-the-road repetitive flooding.
- We work with the trailer park within our township to assure they have a tornado shelter.
- We are a member of the Pine Island Fire District.
- We have adopted all of Olmsted County's regulations.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- 3 Township Supervisors, 1 Clerk & 1 Treasurer
- 1 Fire Chief serving township
- Mutual Aid agreement with neighboring fire districts

**Q3. What programs are in place to help accomplish mitigation in your community?**

- Tornado Siren at trailer park
- Schools serving township all practice tornado drills

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- We have worked with state and federal partners to address mitigation efforts following past floods.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- Need to install a program whereby all Township Officials are recognized for clearance during an emergency. In the past, law enforcement personnel have given us difficulty in accessing our roads to determine damage.
- Need to have a central and well-known location for residents to get/buy sand-bags to mitigate flooding damage.

**QUINCY TOWNSHIP**

Submitted By: Geri Ihrke, Treasurer

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- Quincy Township relies on and will stay in touch with Olmsted County in the event of a disaster. Ours is a very small township and all the residents are known to us. The officers would be in contact with those in need.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Our township officers serve as the staff to help accomplish mitigation.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- We have no emergency program in place. Again, we rely on and will work with, the county.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- We would work with the county.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We don't have a mitigation program, so no deficiencies - N/A

## SALEM TOWNSHIP

Submitted By: Drew Moessner-Township Supervisor

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- We have a township planning and zoning commission. We do improvements to our roads as necessary to protect from repeated over the road flooding. We work with the Byron Fire Department in emergency situations.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- Township supervisors are the front line for road issues. Township residents advise us if they see issues with the roads. The Byron Fire Department acts as our emergency manager along with the Olmsted County Sheriffs Department.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- I am not aware of any in our township.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- I am not aware of any.

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We need to have some of these plans if they are not in place. If they are in place it would be better if more people are made aware of them.

**ADDITIONAL TOWNSHIPS**

(Submitted for Cascade, Dover, Elmira, Haverhill, High Forest, Kalmar, Orion,  
Pleasant Grove, Rochester, Rock Dell, Salem, and Viola townships)

Submitted By: Roger Ihrke, Zoning Administrator

**Q1. What plans, authorities, or policies are in place to help accomplish mitigation in your community?**

- The Towns follow Olmsted County's 20-year Comprehensive Plan (2011) that is designed to plan for the future physical growth of the County and appropriate land uses.
- Each Township has a Planning and Zoning Commission that has established a Floodplain Ordinance. Several of the towns participate in the National Flood Insurance Program (NFIP).
- Each Township has a transportation policy to address road improvement projects that include culvert and drainage improvements to reduce over-the-road repetitive flooding.

**Q2. What staff (organizational capacity) are in place to help accomplish mitigation in your community?**

- The Town Board acts as the public safety committee.

- Each Town contracts with a local fire department to provide emergency response and fire protection and in some cases emergency medical response.
- Olmsted County provides Emergency Management Services to each of the Towns.
- The County has a GIS Division which provides service to each Town.
- We have a County Engineer and a Public Works Supervisors that addresses road maintenance issues for flooding (culverts, repetitive flooding). These organizations work closely with the Towns providing engineering services, monetary support and in some cases road maintenance.
- Each Township's Supervisors address road maintenance issues and work with either their employed or contracted road maintenance crews.

**Q3. What programs are in place to help accomplish mitigation in your community?**

- The Towns use public and private media to make the public aware of an incident.
- The County provides rural residents with severe weather awareness through both classes and the media
- The contracted fire departments provide fire safety education in our schools.
- Our schools practice in tornado drills on an annual basis.

**Q4. What funding or other resources are available to help accomplish mitigation in your community?**

- The Towns have worked with state and federal partners to address mitigation efforts following past disaster events

**Q5. What program gaps or deficiencies do you feel exist that are a barrier to accomplishing mitigation in your community?**

- We need to update our Comprehensive Plan to address greater hazard mitigation, i.e., Flooding