Adopted by Lake Crystal City Council 11/20/23

Blue Earth County

LAND USE PLAN

December 2018

BLUE EARTH COUNTY

In cooperation with:

SRF

[THIS PAGE WAS INTENTIONALLY LEFT BLANK]

Blue Earth County Land Use Plan

DRAFT December 2018

Prepared for:
Blue Earth County
Environmental Services Department
410 S. 5th Street
Mankato, MN 56001

[THIS PAGE WAS INTENTIONALLY LEFT BLANK]

Acknowledgements

The following people played an integral role in the process of developing the Blue Earth County Land Use Plan Update.

PRIMARY STAKEHOLDERS

Thank you to everyone who attended any of the public meetings, completed the survey, provided additional feedback, etc. This plan could not have been completed without your participation.

COUNTY BOARD OF COMMISSIONERS

Kip Bruender

Drew Campbell

Mark Piepho

Will Purvis

Vance Stuehrenberg

PLANNING COMMISSION

Lyle Femrite, Chair

Bill Anderson

Kurt Anderson

Kip Bruender

Barry Jacques

Dusty Riley

Joe Smentek

COUNTY ADMINISTRATOR

Bob Meyer

STUDY REVIEW COMMITTEE

Thank you to the members of the Study Review Committee who contributed a great deal of personal time to ensure this plan meets the needs and expectations of the citizens of Blue Earth County.

John Billings, Blue Earth County Soil & Water Conservation District

Kip Bruender, Blue Earth County Planning Commission

Tom Dougan, Tri-Lakes Region Representative

Lyle Femrite, Blue Earth County Township Association

Scott Fichtner, Blue Earth County Environmental Services

Pete Forrey, Small Business Owners

John Hollerich, Small Cities Representative

George Leary, Blue Earth County Environmental Services

Gretchen Mauerman, Blue Earth County Human Services

Bob Meyer, Blue Earth County Administrator

Terry Overn, Mining Industry

Cathy Riley, Blue Earth County Resident

Garett Rohlfing, Blue Earth County Environmental Services

Aaron Stubbs, Blue Earth County Environmental Services

Ryan Thilges, Blue Earth County Public Works

Kent Wilson Jones, Blue Earth County Resident

RESEARCH INTERVIEWS

Thank you to those individuals who took the time to meet with County staff to achieve a more complete assessment of your industry, your municipality, or your organization.

Roger Keinholtz, Crystal Valley Co-op

Sam Ziegler, GreenSeam

John Considine, Greater Mankato Growth

Dave Preisler, Minnesota Pork Producers

Josh Downey, Blue Earth County Park Supervisor

Patty Smith, City of Amboy

Jennifer Bromeland, City of Eagle Lake

Tim Auringer, City of Eagle Lake

Heather Lowe, City of Good Thunder

Taylor Gronau, City of Lake Crystal

Curt Kephart, City of Madison Lake

Mark Konz, City of Mankato

Patty Woodruff, City of Mapleton

Darla Ward, City of Pemberton

Catherine Seys, City of Saint Clair

Diane Roellofs, City of Vernon Center

COUNTY STAFF

Thank you to the additional members of County staff who contributed a great deal of information, research, review, and technical expertise to bring this plan to realization.

Julie Conrad, Blue Earth County Environmental Services

Jaclyn Essandoh, Blue Earth County Environmental Services

Tim Grant, Blue Earth County Environmental Services

Scott Salsbury, Blue Earth County Environmental Services

[THIS PAGE WAS INTENTIONALLY LEFT BLANK]

Table of Contents

List of Figures

List of Tables

List of Appendices

[THIS PAGE WAS INTENTIONALLY LEFT BLANK]

Chapter 1 - Introduction

Blue Earth County covers 766 square miles in area, consists of 23 townships and 11 municipalities, and includes portions of the cities of North Mankato and Minnesota Lake. The northern boundary of the County is primarily formed by the Minnesota River. There are also many other natural features such as lakes and rivers, wetlands, and steep slopes which play a significant role in the County's development patterns, land management and conservation.

Blue Earth County supports a regional center with industrial, commercial, agricultural and natural resources. The transportation system supports freight, rail and aviation. The lakes, river systems, parks, trails and water trails provide natural scenic beauty and recreational opportunities. Each of these areas plays a unique and important role in the County and the region.

Purpose and Scope

The 2040 Land Use Plan describes the analysis, future projections, goals and strategies that Blue Earth County has developed for how decisions will be made over the next twenty years. The 2040 Land Use Plan is an official document adopted by the County Board as a guide for policy decisions about the physical development of the County. The plan sets broad objectives and strategies to direct the future growth and development in the areas of land use, transportation, water resources, parks, trails and open space, housing, resilience, and the economy. For each topic, the plan identifies issues, sets a goal, establishes objectives to support the goal, and identifies actions needed to accomplish the objectives. To ensure that the plan remains relevant, it should be reviewed regularly and amended as needed.

Planning Area and County Role

Blue Earth County provides a variety of essential services to create vibrant, healthy, and safe communities. Counties support and maintain public infrastructure, transportation, and economic development assets; keep residents healthy; ensure public safety to protect its citizens; administer waste management programs; provide environmental services; administer zoning; and manage regional parks and trails. These efforts are coordinated with many government partners, including the following most related to land use:

- **Cities and Townships** – Cities and townships in Blue Earth County provide essential services including some or all the following: transportation and utility infrastructure, public safety, collection and treatment of wastewater; public water supplies; planning for future growth; providing affordable housing options; and parks and recreation. All cities in the County and Mankato and Lime Townships exercise land use and zoning authority to protect the health, safety and welfare of all residents within their jurisdictions. Blue Earth County floodplain and shoreland ordinances are administered in Mankato Township and Lime Township.

- **State Agencies** – Blue Earth County has delegation agreements with the Minnesota Pollution Control Agency (MPCA) to operate the feedlot program and with the Minnesota Department of Health to administer the Minnesota Well Code. Blue Earth County coordinates with a variety of state agencies to manage planning efforts and implementation. These include agencies such as the Department of Transportation (MnDOT), the Minnesota Pollution Control Agency (MPCA), and the Department of Natural Resources (MNDNR). Each of these departments provides for improvement and planning of various systems across the State of Minnesota.

- **Mankato/North Mankato Area Planning Organization (MAPO)** – The MAPO was established in 2012, following the 2010 U.S. Census which designated the Mankato/North Mankato region a Metropolitan Statistical Area (MSA), requiring formation of a Metropolitan Planning Organization (MPO). MAPO is represented by the cities of Mankato, North Mankato, Eagle Lake, and Skyline; Blue Earth and Nicollet Counties; and the Townships of Belgrade, Lime, South Bend, LeRay and Mankato. MAPO is responsible for regional transportation planning throughout the Greater Mankato area, and must provide a continuing and coordinated transportation planning process to obtain federal transportation funds.

Blue Earth County's jurisdiction with feedlot permitting, Minnesota Well Code, and subsurface sewage treatment systems (SSTS) permitting, inspections and enforcement is County-wide. Blue Earth County also administers the Minnesota Wetland Conservation Act (WCA) in all jurisdictions except the City of Mankato. The County coordinates with municipalities, townships and State agencies to administer these programs.

The County manages stormwater pollution through the federal regulations identified in the Municipal Separate Storm Sewer System (MS4) Program. The goal of the MS4 is to improve water quality by reducing pollutants that enter these public systems and discharge into lakes, rivers and wetlands. The MS4 communities within Blue Earth County include Mankato, Eagle Lake, Skyline, Mankato Township, and South Bend Township and Minnesota State University-Mankato.

The Blue Earth County Land Use Plan acknowledges other existing municipal, township and regional plans which were reviewed and incorporated to complement the public input process and ensure continuity of planning throughout the County.

Plan Overview

An effective Land Use Plan needs to be based on reasonable expectations of future population while also balancing shifts in population and other trends throughout the County. As addressed in Chapter 3, the Minnesota Demographer's 20-year (2040) population projection anticipates the County may grow by roughly 6,000 people. One of the objectives of this plan is to aid with future decisions related to accommodating this projected increase. The actual population of Blue Earth County may vary based on employment, housing options, land characteristics, regulations, and other trends.

Public and Stakeholder Input

This plan is derived from existing adopted plans, and feedback from the residents and stakeholders of Blue Earth County. Based on the information presented in existing plans and the public input, preference was shown for the preservation of agricultural land, locating new industrial, commercial, and high density residential development in existing communities, and expanding recreational opportunities. The goals, objectives and implementation measures included with this plan are derived from those plans and public input received throughout this process and are the primary concepts that shape the strategies identified in this plan. Strategies and analysis are described related to land use, natural resources, housing, and economic development that will help to achieve the goals set within this plan.

Priority Planning Principles

The Land Use Plan supports development that, when possible, meets current needs without creating unnecessary environmental, economic and social burdens on future generations. The County is committed to maintaining and enhancing economic opportunity and community well-being while protecting and restoring the natural environment upon which people and communities depend.

Blue Earth County supports well-planned, essential infrastructure, stewardship of cultural and natural amenities such as land and water resources, parks and open spaces which contribute to a high quality of life and the protection of agricultural land and the rural character of the County.

Plan Vision

The tools, strategies and goals outlined within this plan were developed to support an overall vision for the future of Blue Earth County. The following Land Use Plan vision statement will be referred to as future decisions are made and the plan is updated.

Blue Earth County will continue to provide a high quality of life for its residents, from agricultural production to urban living. A focus on agricultural preservation, natural resource protection, recreational opportunities, and well-planned growth throughout the county will preserve and secure diverse quality-of-life options for residents.

Plan Elements

This 2040 Land Use Plan contains nine chapters that are guided by the County's mission, values, goals, vision, priority planning principles and public engagement findings. Many of the objectives and plan elements remain consistent from the previous 1998 plan. New elements, strategies and actions since the adoption of the last plan include the addition of a community resilience section and changes to land use regulations found in chapters five and nine respectively. A summary of each chapter of the plan follows.

Public Participation Process – Chapter Two

This chapter summarizes the public participation activities including deliberations with the Study Review Committee and township officials, website, focus group meeting, open house meetings, survey, in-depth interviews with stakeholders and incorporation of other previously adopted plans. Themes from the public participation process were incorporated in chapters of the plan to reflect desires and concerns of residents.

County Context and Social Characteristics – Chapter Three

This chapter considers the economy, the needs of the people, and other important themes that face the County in coming years. It contains key data that lays the framework for the plan.

Physical Characteristics and Natural Resources – Chapter Four

This chapter summarizes existing physical characteristics related to climate, soils, geology, groundwater and surface waters. Important natural resources in the Blue Earth County Greenprint are also in this chapter.

Community Resilience – Chapter Five

This chapter addresses lifeline services, including drinking water, wastewater, stormwater, waste management and energy; vulnerabilities of individuals, local systems and infrastructure to flooding and erosion; and preparing for impacts of natural and man-made disasters to reduce loss of life and property.

Land Use – Chapter Six

This chapter describes land use in the County and areas where the County maintains land use authority through local ordinances or Minnesota Rules, including shoreland areas, floodplains, wetlands, subsurface sewage treatment systems, feedlots, and water wells. Municipalities, Mankato Township, and Lime Township have land use authority within their boundaries; however, the County retains floodplain authority in these jurisdictions.

Growth is managed with zoning, orderly annexation agreements and the Blue Earth County Urban Fringe Overlay Districts. This chapter also reviews existing park and open space facilities throughout the County.

Economy – Chapter Seven

This chapter summarizes key elements of the economy. Blue Earth County is a regional center of education, commerce, industry, and agriculture. Agricultural production makes a significant contribution directly and indirectly to the local and regional economy.

Transportation – Chapter Eight

This chapter highlights the transportation network in the County, including highways, public transportation, rail, air, and trails, which contribute to the safety and quality of life of residents and visitors. The County builds and maintains roadways and trails and supports partnerships with townships, municipalities, and the State to provide safe and efficient transportation systems and develop plans for the urban area centered around Mankato and North Mankato.

Goals, Objectives and Implementation Strategies – Chapter Nine

This chapter outlines the vision, goals, objectives, and strategies for the 2040 Blue Earth County Land Use Plan. Elements from each chapter of the plan, when utilized together, serve as a guide for land use and development. The Land Use Plan provides for logical development patterns that preserve the existing natural resources, retain the existing character of the County, and provide a high quality of life.

Appendices

The appendices include maps and elements of other plans as well as more information about the public participation process.

Appendix A - Physical Environment and Natural Resources Maps

Appendix B - Survey Results

Appendix C - Public Meetings Summaries and Presentations

Appendix D - In-depth Interviews with Municipalities

Appendix E - In-depth Interviews with Economic Development Stakeholders

Appendix F - Greenprint

Appendix G - Groundwater Pollution Sensitivity

Appendix H - Flooding

Appendix I - Wetlands

Appendix J - Stormwater

Appendix K - Surface waters

Appendix L - Near Channel Erosion

Appendix M - Access management (MATAPS and/or MAPO)

Chapter 2 – Public Participation Process

A long-range planning effort yields the best and most supportable results when built upon a strong foundation of public input. When the public is engaged throughout the planning process, it allows for the creation of a vision and strategies that guide future decision making that is already supported by residents. Blue Earth County executed an approach to public participation that showcased the commitment to gaining the highest level of public participation possible. Methods such as public meetings, focus groups, interviews, surveys, website and open house forums were used to identify and prioritize key issues and initiatives considered important by the County.

A two-phase approach including the data collection phase and plan review phase were implemented to accomplish the purpose of developing goals and objectives, and crafting implementation strategies. The data collection phase included deliberations with the Study Review Committee, a presentation to the Township Officers, a public forum open house, an online survey, and four regional focus group meetings. This included efforts to understand residents' concerns and their thoughts and ideas about opportunities for the future of the County. The plan review phase included interviews with city officials and economic development related stakeholders. A second public forum open house was held September 24, 2018. The purpose of this meeting was to review the draft plan with the public and ensure that the plan addressed their concerns while protecting the public's health, safety and welfare.

The Blue Earth County Land Use Plan Update used the information gathered during public involvement efforts, the survey results from the 1998 Land Use Plan and other additional supporting plans of the County as a foundation for formulating goals, objectives and implementation actions included in the Plan.

Role of the Study Review Committee

During the initial phase of this process, County Planning staff worked with SRF to identify potential Study Review Committee (SRC) members. The SRC is a group of sixteen (16) individuals that represented various agencies or interest groups within Blue Earth County. The main goal of the SRC was to bring attention to any current issues or future concerns that affect their respective agencies or groups. In addition, all SRC members were tasked with reviewing all materials prior to public release, participate in five scheduled committee meetings, help guide the development of the Community Survey and the Land Use Plan. Most importantly, members of the SRC acted as

advocates for the pubic and the overall process. The following list shows the five scheduled SRC committee meetings which were all held at the County Court House:

- March 2, 2017 Study Review Committee Meeting
- July 3, 2017 Study Review Committee Meeting
- August 17, 2017 Study Review Committee Meeting
- November 9, 2017 Study Review Committee Meeting
- October 16, 2018 Study Review Committee Meeting

Website Development

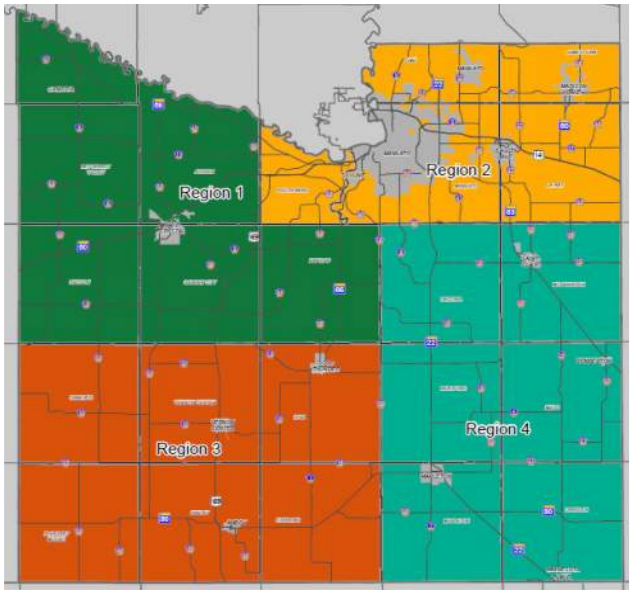
In March 2017, a project specific website was launched to provide Study Review Committee members, municipal officials and the public with easy access to the most current information related to the Plan. Initially, the website provided an overview of the planning process and schedule, the functions of the Study Review Committee and public regional meetings. As the Plan evolved, different elements were posted on the website including a link to the online survey via SurveyMonkey and the final survey results. Contact information was also provided on the website so that any member of the public could address Planning and Zoning Staff with questions related to the planning process.

Focus Group Meetings

To facilitate discussion and gather input specific to the different areas of the County, four regional focus group meetings were held. A specific invitation list of residents, business owners, city and township staff and officials, and other regional stakeholders was developed for each region. A presentation was provided at each meeting with an overview of the County's existing conditions and those specific to the region, followed by discussion of various growth management, land use and zoning topics. Details of the four regional focus group meetings are attached as Appendix C. The following list shows the meetings:

- May 4, 2017 Region #1 Focus Group Meeting
  - Lake Crystal Area Recreation Center
- May 11, 2017 Region #2 Focus Group Meeting
  - Eagle Lake - Eagle Lake City Hall
- May 30, 2017 Region #4 Focus Group Meeting
  - Mapleton - Maple River Senior High School
- June 8, 2017 Region #3 Focus Group Meeting
  - Amboy - Snowbird's Meeting Hall

Figure 1: Land Use Plan Regions



Public Open Houses

A kick-off meeting and two open house meetings were organized which included efforts to understand residents' concerns, thoughts and ideas about opportunities for the future of the County and to ensure that the most accurate information was gathered. Additionally, County staff and consultants from SRF attended and presented information about the Land Use Plan Update and asked for input from the townships officials at three of their township quarterly meetings.

The kick-off meeting was held on March 7, 2017 at the County Court House. The first public open house was also held on April 18, 2017 at the Maple River West Elementary School. The meeting was open to all residents and stakeholders of the County. A presentation of existing conditions was given, with time provided for questions and answers. Participants also completed three exercises to provide specific input including:

- Identifying the major opportunities and challenges for the future of Blue Earth County.
- Creating a vision statement to guide the future of Blue Earth County.
- Developing a Future Land Use Plan for Blue Earth County

The second public open house was held September 24, 2018. The public was given an opportunity to review the plan's goals, objectives and implementation strategies for a wide range of plan elements, including agriculture, natural resources, community resilience, development, transportation, housing and land use.

Final comments were received regarding the plans recommendations and future land use plan. These comments were considered in the final revisions of the plan.

Public Survey

During the first phase of the Land Use Plan Update, a public survey was conducted to collect input from County residents. Aside from demographic information, survey questions were aimed at gaining an understanding of the overall challenges and opportunities experienced by residents, and garnered specific information about growth strategies, natural resources, and County services. The survey was available online, via SurveyMonkey, with hard copies available upon request. The survey was open from April to July 2017 and received a total of 44 responses. Results from the survey together with survey results from the 1998 Land Use Plan and extracts from other support plans of the County were used to update the County's goals, objectives and implementation strategies. The survey results are attached as Appendix B.

In-depth Interviews with Municipalities

After an initial review of the findings of the survey, it was determined that meetings with city officials were important to ensure that the County's plan was not in direct conflict with the plans of its municipalities. In addition to the Planning Coordinator for the City of Mankato, County staff contacted a representative for each of the municipalities within Blue Earth County. Meetings or phone interviews were conducted with the Zoning Administrator's, City Administrator's, and/or Clerks. Details of the findings from these interviews are found in Appendix D.

In-depth Interviews with Economic Development Stakeholders

Interviews were conducted with individuals representing Greater Mankato Growth, GreenSeam and other agribusinesses in the County. These interviews were conducted to determine their future needs and reinforce their contribution to the economy of Blue Earth County. Details of the findings from these interviews are found in Appendix E.

Other Plans

Existing local and regional plans were reviewed to identify issues and develop goals, objectives and strategies to be consistent with other plans where appropriate. Significant efforts have been made by the County and other partners to obtain public and technical input in development of these plans. The following plans were reviewed for updating the Land Use Plan:

County Plans

- Blue Earth County Water Management Plan 2017-2026
  - The Blue Earth County Water Management Plan was updated in 2017 to address local surface and groundwater priorities. Local water plans are being replaced by ten-year watershed plans by 2025.
- Blue Earth County Greenprint, adopted as part of the Water Management Plan in December of 2017.
  - Work on the Blue Earth County Greenprint was completed along with the Water Management Plan and is included in the Land Use Plan. Because land use affects water resources in the County, sections of the Water Management Plan are included in the Appendices of the Land Use Plan to continue supporting and acknowledging local priorities.
- Blue Earth County All Hazard Mitigation Plan 2013 Update
- Blue Earth County Land Use Plan 1998

Regional Plans

- Mankato Area Transportation and Planning Study (MATAPS) 2035 Multi-modal Transportation Plan, March 2011
- Mankato/North Mankato Planning Area Organization (MAPO) 2045 Transportation Plan, November 2015 (to be updated in 2020)

As these and similar plans are updated, they should be considered when implementing the Land Use Plan and in future updates. For example, the Minnesota Department of Transportation (MnDOT) and the Mankato/North Mankato Area Planning Organization (MAPO) are conducting the Highway 22 Corridor Study from St. Peter to Mapleton that will address potential land use impacts and opportunities. Once the study is finished, MAPO will begin the process of updating their long-range transportation plan with anticipated completion coming in 2020.

Chapter 3 - County Context and Social Characteristics

The characteristics of any given place are directly tied to how people live, work, and spend their time, in combination with the physical landscape. Understanding these aspects, and the history behind them, helps to plan for a future that preserves important features and modifies others to achieve the desired vision. The following chapter provides an overview of current and historic trends for Blue Earth County.

Region

Blue Earth County is in south-central Minnesota, approximately 70 miles southwest of the Twin Cities metropolitan area. According to the 2010 Census, 64,013 people reside within the County. The County is comprised of 766 square miles, containing 23 townships and 11 cities, and includes portions of the cities of North Mankato and Minnesota Lake. It is a part of the regional population center of Mankato-North Mankato, which has a population of more than 52,000 between Blue Earth and Nicollet Counties.

Blue Earth County is bordered by seven other counties, many with similar physical and economic characteristics. The presence of Mankato contributes to the County's status as a regional hub for economic activity. Over half of the jobs in 2015 within Blue Earth County are held by non-residents.

Demographics

A study of historic and existing demographics of Blue Earth County sets the stage for understanding the social and human characteristics of the residents. It is not assumed that these trends will remain constant through the planning period, but the data provides a baseline to be reviewed and built upon. Most of the data presented in this section utilizes the United States Census, the American Community Survey (ACS), and the Minnesota Demographic Data Center.

Three elements of population (historic, current and future) are reviewed to inform long-range planning efforts. Historic and current population totals also influence future population projections.

- Historic population totals speak to how the County's population has grown and changed over the years.
- Current population totals tell us where the population currently is. Since this plan is being developed between the decennial census, population estimates are the only source of current population.
- Population projections provide a forecast of what the population may be in the future. These projections provide an estimate for the long-range planning of services to provide for the future population.

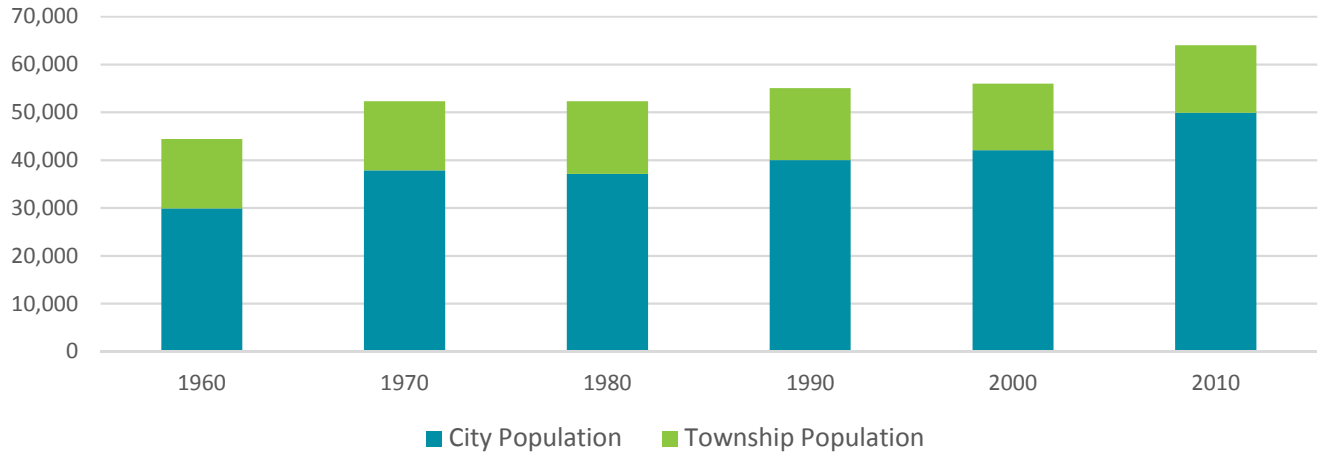
Other aspects of population that are also reviewed include age and gender distribution. This data helps to identify potential issues and often relates closely to the economic and housing characteristics of a County or region. To some extent, they also influence what a community will look like and how it will grow and change in the future.

Historic Population

Since 1960, Blue Earth County has seen varying population growth rates between each decennial Census (10-year increments). The largest population increase (17.9 percent) in 50 years occurred from the 1960 to 1970 Census recordings. This was followed by a slight population decline of 0.02 percent (8 persons) from 1970 to 1980. Population growth in the County increased to 5.2 percent between 1980 and 1990. In the 1990's the rate of population growth in the County slowed down to an increase of 1.6 percent from 1990 to 2000. However, growth increased significantly from 2000 to 2010 where the County's population grew by 14.4 percent (8,072 persons) during that period.

The City of Mankato comprised just over 61 percent of the total County population in 2010. The significant population growth increase of the County between 2000 and 2010 is likely the result of a major increase in Mankato's population (21.2 percent) for the same time. In addition, Madison Lake grew by 22 percent (2.2 percent each year) and Eagle Lake grew by 36 percent (3.6 percent each year) from 2000 to 2010. Table 1 and Figure 1 show the County population broken down by townships and cities from 1960 to 2010. Since 1960, population growth in the cities has occurred at a higher rate than growth within the townships. In 1960, 67 percent of the County's population resided in a city. In 2010, 78 percent of the population resided in a city, a growth of 11 percent.

Figure 2: Blue Earth County Historic Population 1960 - 2010



Source: U.S. Census

Table 1: City and Township Population 1960 to 2010

	1960 Population	1970 Population	1980 Population	1990 Population	2000 Population	2010 Population
City Population	29,873	37,858	37,100	39,969	42,078	49,906
Township Population	14,512	14,464	15,214	15,075	13,863	14,107
County Population	**44,385**	**52,322**	**52,314**	**55,044**	**55,941**	**64,013**

Source: U.S. Census

City and Township Population Change

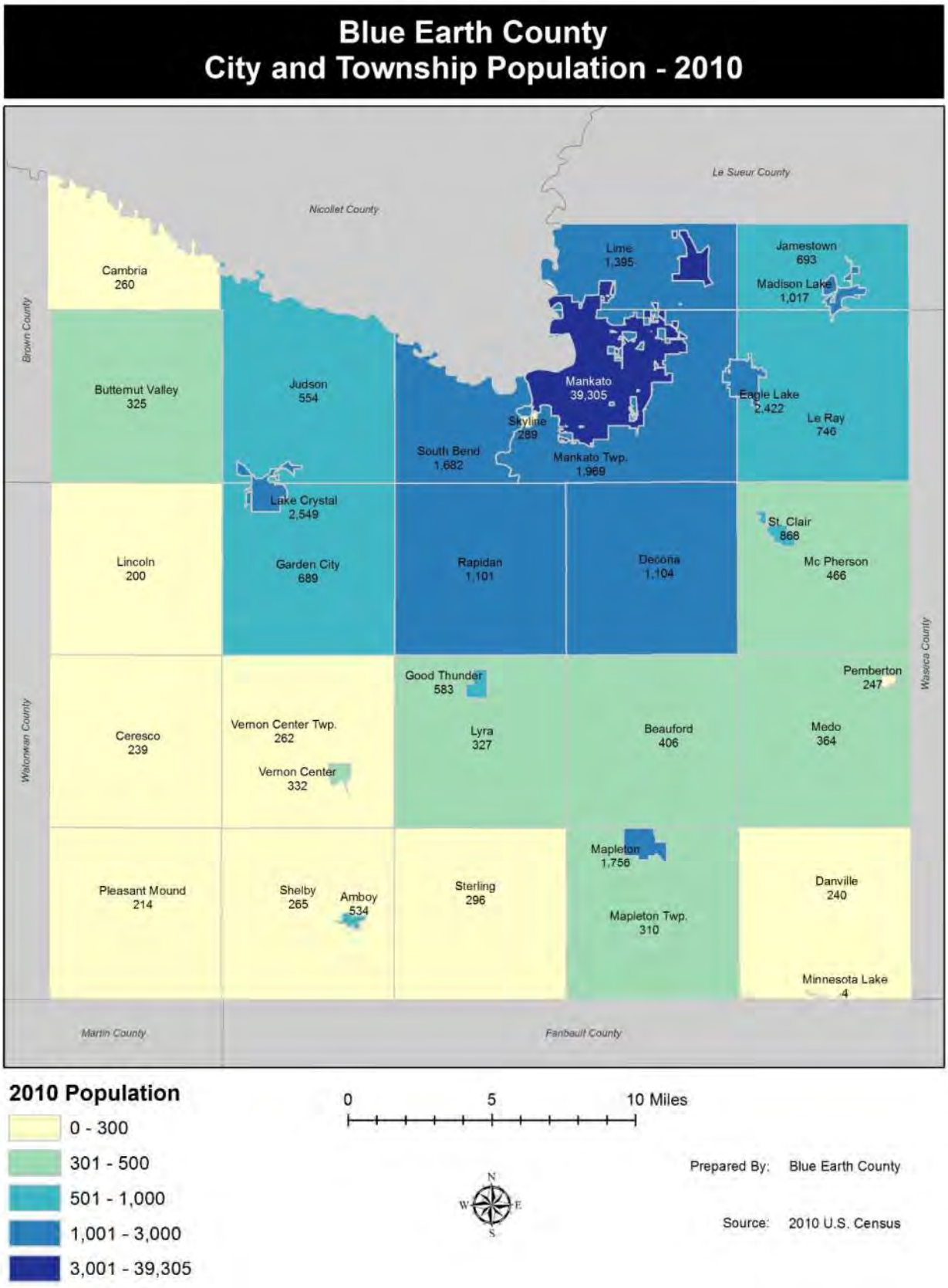
A review of the County's total population change only tells part of the story. Each township and city within Blue Earth County experiences individual population changes. Between 2000 and 2010, most of the population increase for cities and townships occurred in the northeast corner of the County. This is consistent with the large population increase experienced in Mankato, Eagle Lake and Madison Lake. Townships with a population decrease of 10 percent or more during that same time frame included Butternut Valley, Lincoln, Lyra, Vernon Center and Le Ray. The City of Skyline also experienced a population decrease of greater than 10 percent. The population for each city and township for 2000, 2010 and 2016 are shown in Table 2, along with the population estimates developed by the Minnesota Demographer for 2016.

Table 2: City and Township Population Change

	2000 Population	2010 Population	Percent Annual Change 2000 to 2010	2016 Population Estimate	Percent Annual Change 2010 to 2016
City					
Amboy	575	534	-0.7%	517	-0.3%
Eagle Lake	1,787	2,422	3.6%	3,067	2.7%
Good Thunder	592	583	-0.2%	540	-0.7%
Lake Crystal	2,420	2,549	0.5%	2,542	0.0%
Madison Lake	837	1,017	2.2%	1,183	1.6%
Mankato (part)	32,427	39,305	2.1%	42,799	0.9%
Mapleton	1,678	1,756	0.5%	1,743	-0.1%
Minnesota Lake(part)	0	4	-	2	-5.0%
North Mankato (part)	0	0	-	5	-
Pemberton	246	247	0.0%	233	-0.6%
St. Clair	827	868	0.5%	846	-0.3%
Skyline	330	289	-1.2%	282	-0.2%
Vernon Center	359	332	-0.8%	312	-0.6%
City Total	***42,078***	**49,906**	**1.9%**	**54,071**	**0.8%**
Township					
Beauford	442	406	-0.8%	385	-0.5%
Butternut Valley	382	325	-1.5%	299	-0.8%
Cambria	271	260	-0.4%	243	-0.7%
Ceresco	255	239	-0.6%	214	-1.0%
Danville	262	240	-0.8%	226	-0.6%
Decoria	922	1104	2.0%	1,095	-0.1%
Garden City	700	689	-0.2%	653	-0.5%
Jamestown	628	693	1.0%	611	-1.2%
Judson	591	554	-0.6%	524	-0.5%
Le Ray	846	746	-1.2%	720	-0.3%
Lime	1,314	1395	0.6%	1,018	-2.7%
Lincoln	227	200	-1.2%	192	-0.4%
Lyra	378	327	-1.3%	302	-0.8%
McPherson	470	466	-0.1%	454	-0.3%
Mankato	1,833	1969	0.7%	1,801	-0.9%
Mapleton	310	310	0.0%	289	-0.7%
Medo	374	364	-0.3%	347	-0.5%
Pleasant Mound	235	214	-0.9%	199	-0.7%
Rapidan	1,061	1101	0.4%	1,071	-0.3%
Shelby	294	265	-1.0%	242	-0.9%
South Bend	1,491	1682	1.3%	1,620	-0.4%
Sterling	276	296	0.7%	264	-1.1%
Vernon Center	301	262	-1.3%	247	-0.6%
Township Total	***13,863***	***14,107***	***0.2%***	***13,016***	***-0.8%***
County Total	**55,941**	**64,013**	**1.4%**	**67,087**	**0.5%**

Source: U.S. Census 2000 and 2010, Minnesota Demographic Data Center 2016 Estimate

Figure 3: Population by Jurisdiction, 2010

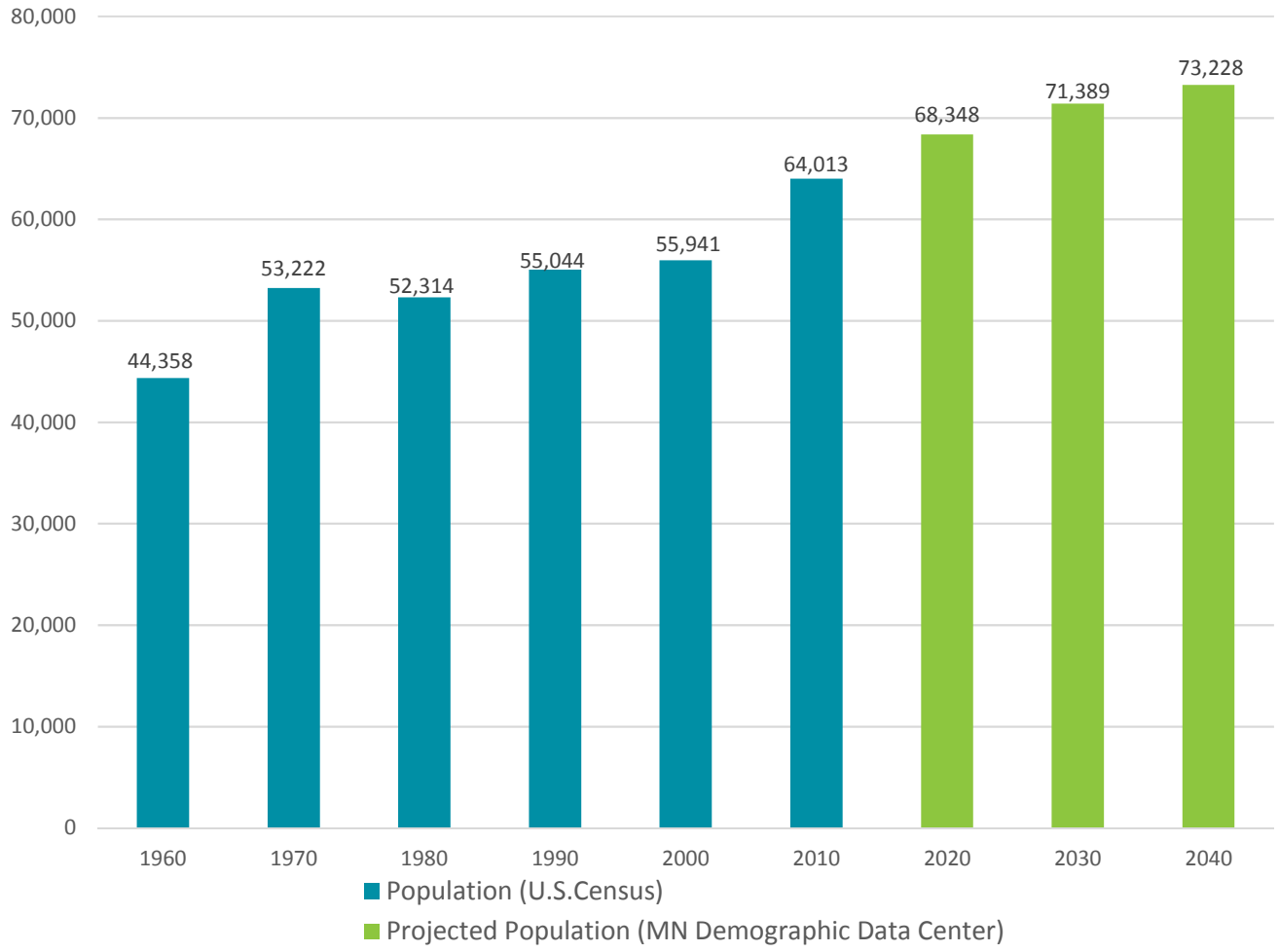


Population Projections

Projecting the future population of a community provides valuable information for planning for the future. The Minnesota State Demographic Data Center provides statewide population projections and projections for each County in Minnesota. Their population projections are based on many factors including birth rates, death rates, migration rate, population estimates and population age cohorts.

The State Demographic Data Center's population projections for Blue Earth County are shown in Figure 4. They show that the County population will increase to 73,228 by 2040. The projected growth rate is 4.5 percent from 2020 to 2030 and slows to 2.6 from the period 2030 to 2040.

Figure 4: Blue Earth County Population 1960 to 2010 and Projected Population 2020 to 2040



Source: U.S. Census and State Demographic Data Center, 2017

Median Age

Long-range planning must account not only for total population change, but for changes in the size of population subgroups that have differing needs, such as young children and the elderly. Table 3 provides the median age statistics for Blue Earth County, and the communities within.

City residents are, on average, nearly 10 years younger than township residents. Additionally, the residents of Mankato are nearly 10 years younger than residents of other cities in the County, on average. The median age of township residents experienced the largest increase between 2000 and 2010 of 3.1 years. This statistic is consistent with state and national trends of aging populations in rural areas. Additionally, the presence of multiple university systems within the Mankato area likely contributes to the community's lower median age.

Table 3: Median Age

Geography	2000 Median Age	2010 Median Age
Blue Earth County	29.9	29.8
Cities*	34.4	35.1
Townships	41.8	44.9
City of Mankato	25.3	25.4

**Mankato excluded – To exclude Mankato, Census data was retrieved for individual cities and townships. Median age is the weighted average of the medians of the component cities and townships, based on population.*

Source: U.S. Census, 2000 and 2010

Age Distribution

Analysis of the distribution of age and gender cohorts of a community provides for a review of potential population shifts and changing development needs. A population pyramid is a tool used to analyze the distribution of population by age and gender. The population pyramid in Figure 5 shows the 2010 Census data for the County. The largest age cohort is the 20 to 24-year-olds totaling 16.7 percent of the total population. The presence of the post-secondary education systems is likely a large contributor to this statistic. The post-secondary institutions in the area and their number of students in 2018 from Greater Mankato Growth are:

- Minnesota State University Mankato – 18,000 students
- Rasmussen College – 650 students
- South Central College (North Mankato and Faribault) – 5,500 students
- Bethany Lutheran College – 600 students

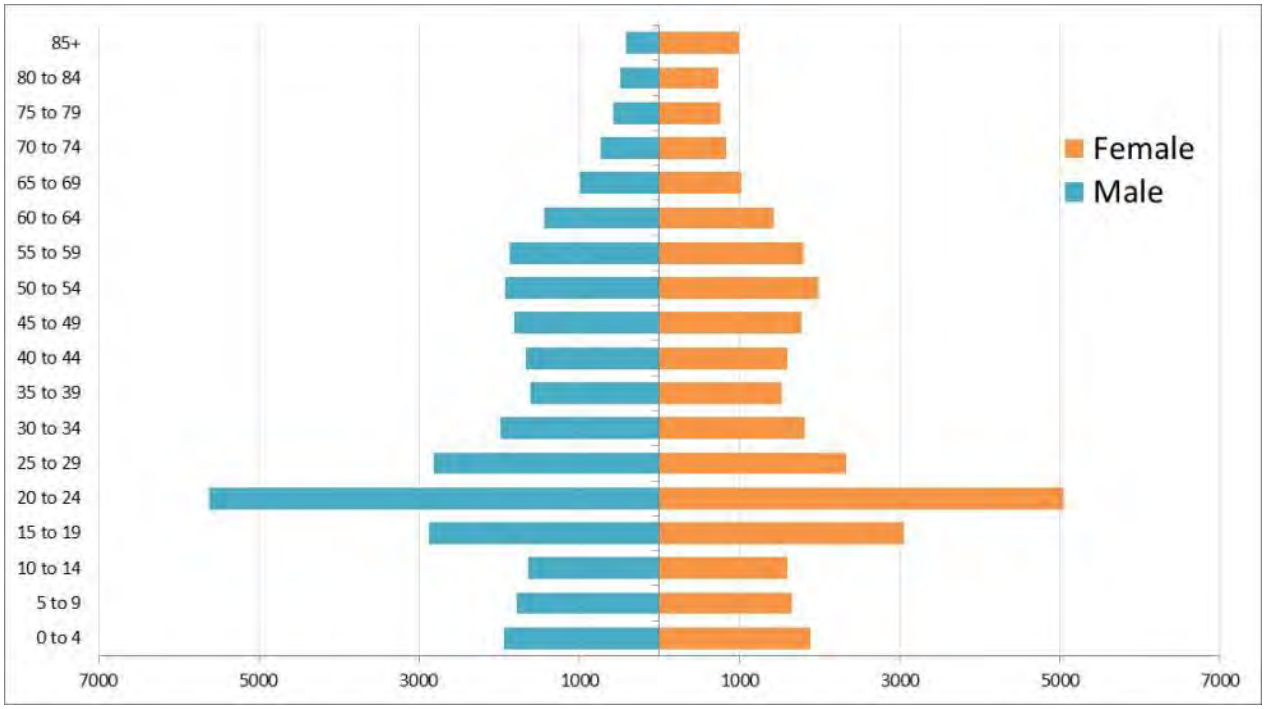
The Baby Boom Generation (born from 1946 to 1964) can be seen in the age cohorts from 45 to 64 in the 2010 population pyramid. This generation is the second largest in the 2010 population pyramid, following the Millennial Generation (born from 1981 to 1996).

When the City of Mankato's population is not included in the County's population pyramid for the 2010 Census data, the pyramid not surprisingly provides a far different balance for the County. Figure 6 shows the population pyramid for the County in 2010 without including the City of Mankato. An older population is clearly indicated, and the population pyramid would be classified as stationary or borderline constrictive. The three largest age cohorts are in the baby boom generation classes of 45 to 49, 50 to 54, and 55 to 59.

Figure 7 shows the population pyramid for the 2040 projected County population. In 2010, 11.8 percent of the County population was over the age of 65. By 2040, it is estimated that 26.2 percent of the County population will be over the age of 65. It is estimated that there will be an additional 10,949 people in the County over the

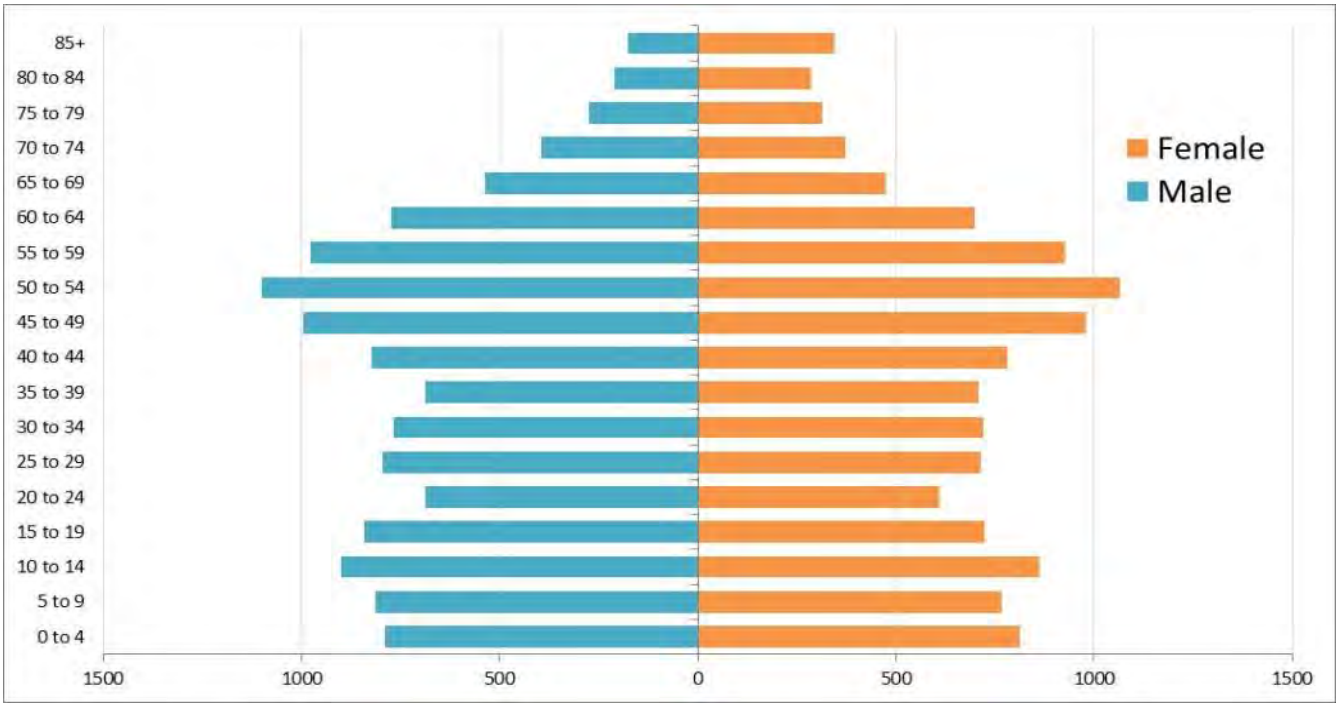
age of 65 by the year 2040 compared to 2010. The population pyramid for 2040 shows what will be an aging population in the County while the college aged population continues to be a significant part of the population.

Figure 5: Blue Earth County Population Pyramid, 2010



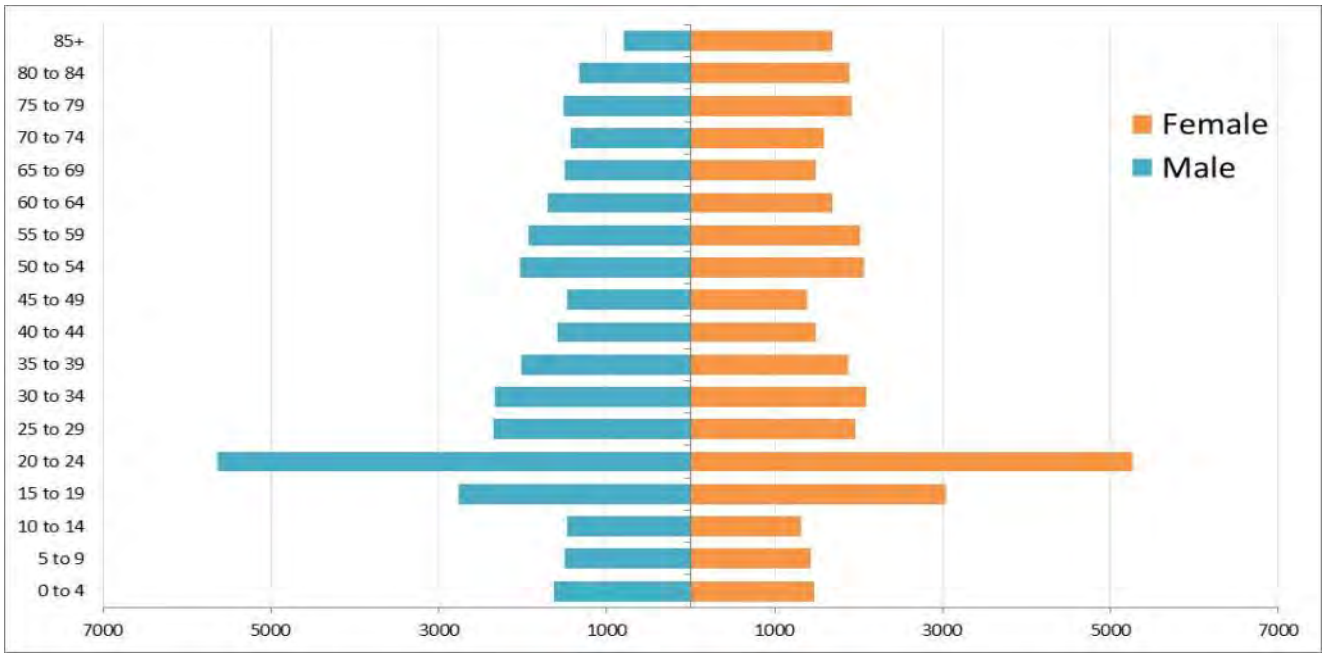
Source: United States Census, 2010

Figure 6: Blue Earth County Population Pyramid without the City of Mankato, 2010



Source: United States Census, 2010

Figure 7: Blue Earth County Projected Population Pyramid, 2040



Source: State Demographic Data Center, 2017

Occupancy Status and Tenure

Ownership data provides an estimate of the percentage of housing units that are occupied by renters or owners, versus vacant units. The ACS estimated a total of 27,139 households in Blue Earth County in 2016. Of these households, 92.4 percent were identified as occupied, with the remaining 7.6 percent (or 2,058 households) as vacant. Nearly 58 percent of the occupied households are estimated to be occupied by the owner, with renters occupying approximately 34 percent of the households (see Table 5). The 2016 estimates represent an increase of approximately 937 households from 2010 with occupancy reducing by 0.9 percent. Data from the American Community Survey also shows that majority of households outside the metropolitan area are owner occupied and that rate has increased from 2010 to 2016. Even though renter occupied units within the City of Mankato increased from 6,513 units to 7,712 units between 2010 and 2016, the rental units declined by 4.2 percent in areas outside the metropolitan area. These statistics indicate a willingness of inhabitants to locate near municipal services which have comparatively a higher cost of rental housing than those outside the city limits.

Table 4: 2010 Household Occupancy and Tenure

Occupancy characteristics	Blue Earth County		City of Mankato		Blue Earth County without Mankato	
	Households	Percent	Households	Percent	Households	Percent
Owner Occupied	15,951	60.9%	7,929	50.9%	8,022	75.4%
Renter Occupied	8,494	32.4%	6,513	41.9%	1,981	18.6%
Vacant	1,757	6.7%	1,118	7.2%	639	6.0%
Total	**26,202**	**100%**	**15,560**	**100%**	**10,642**	**100%**

Source: U.S. Census, 2010

Table 5: 2016 (Estimate) Household Occupancy and Tenure

Occupancy characteristics	Blue Earth County		City of Mankato		Blue Earth County without Mankato	
	Households	Percent	Households	Percent	Households	Percent
Owner Occupied	15,791	58.2%	8,029	47.5%	7,762	75.7%
Renter Occupied	9,290	34.2%	7,712	45.7%	1,578	14.4%
Vacant	2,058	7.6%	1,150	6.8%	908	8.9%
Total	**27,139**	**100%**	**16,891**	**100%**	**10,248**	**100%**

Source: American Community Survey, 2016

Household Size

Household size defines the average number of people living within a household. This number can include both family and non-family living arrangements (i.e., unrelated individuals who share the same living space and function as a single economic unit). Institutional and non-institutional group quarters are not included in the household count. The 2016 ACS estimates that most Blue Earth County households contain two people constituting 37.3 percent (see Table 6). One-person households are the second largest contingent with 27.1 percent, which is largely due to households within the City of Mankato. Examination of Blue Earth County's households without the City of Mankato yields different results, with households of four or more people making up the second largest category of household size (22 percent).

Table 6: Household Size (2016)

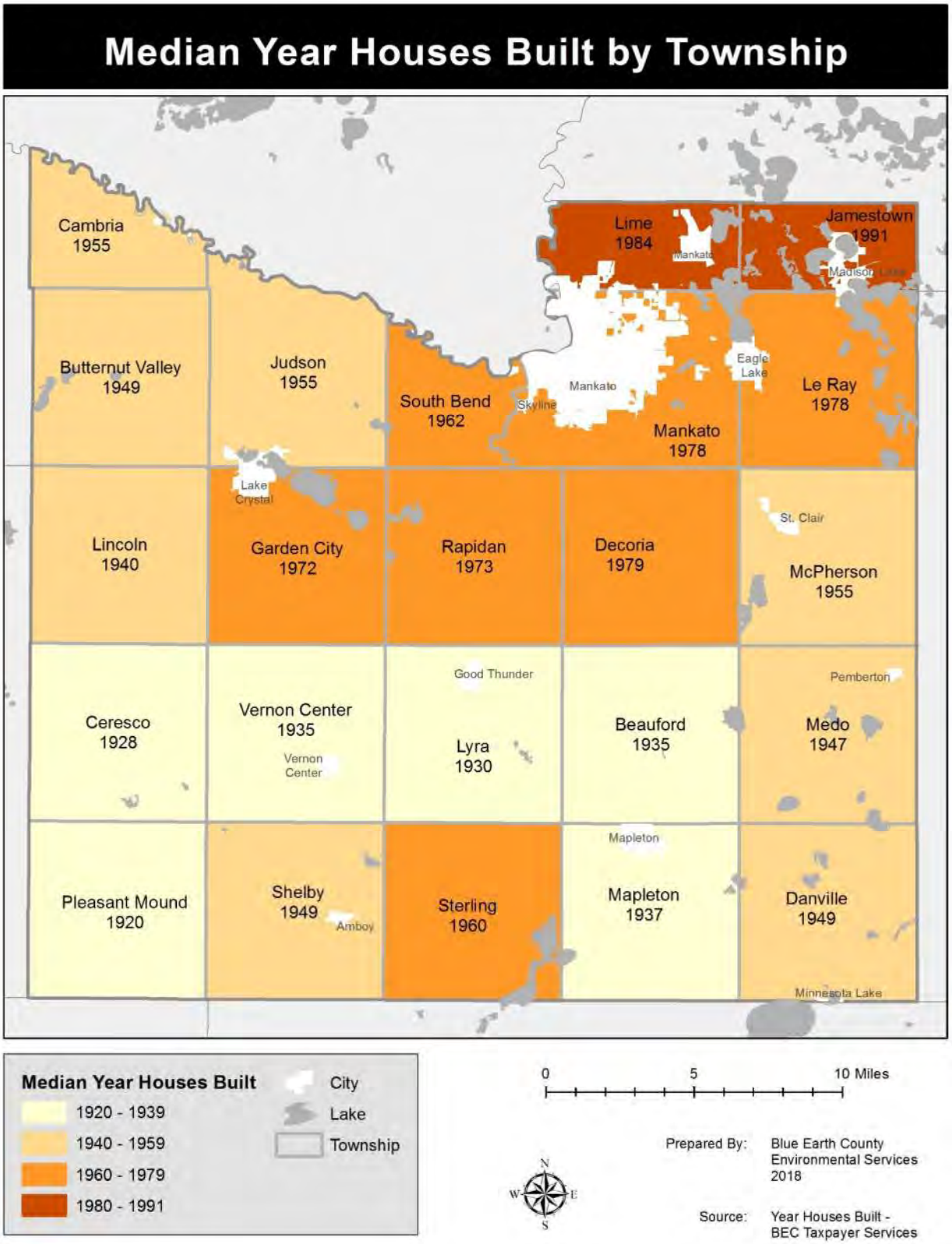
Household Size	Blue Earth County		City of Mankato		Blue Earth County without Mankato	
	Households	Percent	Households	Percent	Households	Percent
1-person	7355	27.1%	5236	31.0%	2118	20.7%
2-people	10123	37.3%	5946	35.2%	4177	40.8%
3-people	4179	15.4%	2483	14.7%	1696	16.6%
4 or more people	5482	20.2%	3226	19.1%	2256	22.0%
Total	**27,139**	**100%**	**16,891**	**100%**	**10248**	**100%**

Source: U.S. Census and American Community Survey

Age of Houses

The median year of houses built for each of the townships in the County is shown in Figure 8. The data was compiled using the year houses were built from the County tax system. There is significant range in the median year that houses were built throughout the County with the newest housing being generally located in the townships in the north and northeast parts of the County. Pleasant Mound has the oldest housing stock with a median year built of 1920. Jamestown Township has the newest housing stock with a median year built of 1991.

Figure 8: Median Year Houses Built by Township



Chapter 4 – Physical Environment and Natural Resources

The physical environment and natural resources are two key components of the character of Blue Earth County and play a large role in the quality of life for residents. These features contribute to the location and characteristics of future development and provide services to residents. The County manages many services, programs, and regulations related to natural resources, including floodplain regulations, aggregate mining, septic systems, etc.

Natural Resources

Blue Earth County is home to natural resources that contribute to the high quality of life. Future development should be considered in a manner that limits the impacts to existing natural resources systems, preserving their presence for future generations. Cumulative impacts of development should be considered with development. In addition to the Land Use Plan, Blue Earth County participates in other planning and regulatory efforts. Development should be carried out in accordance with the strategies of the important natural resource planning efforts included in this plan, its appendices and other plans.

The responsibility for protecting and maintaining natural resources rests with governmental entities as well as land owners. Water quality is significantly impacted by land use activities, including agricultural runoff from tiled fields, waste from feedlots, runoff from construction sites, fertilized lawns, and storm-water runoff from impervious surfaces. Blue Earth County will continue to promote water quality in partnership with state and federal agencies and its current partners. Development considerations will support natural resource planning efforts of the County and the objectives and regulations of local, regional, state, and federal entities.

Soils

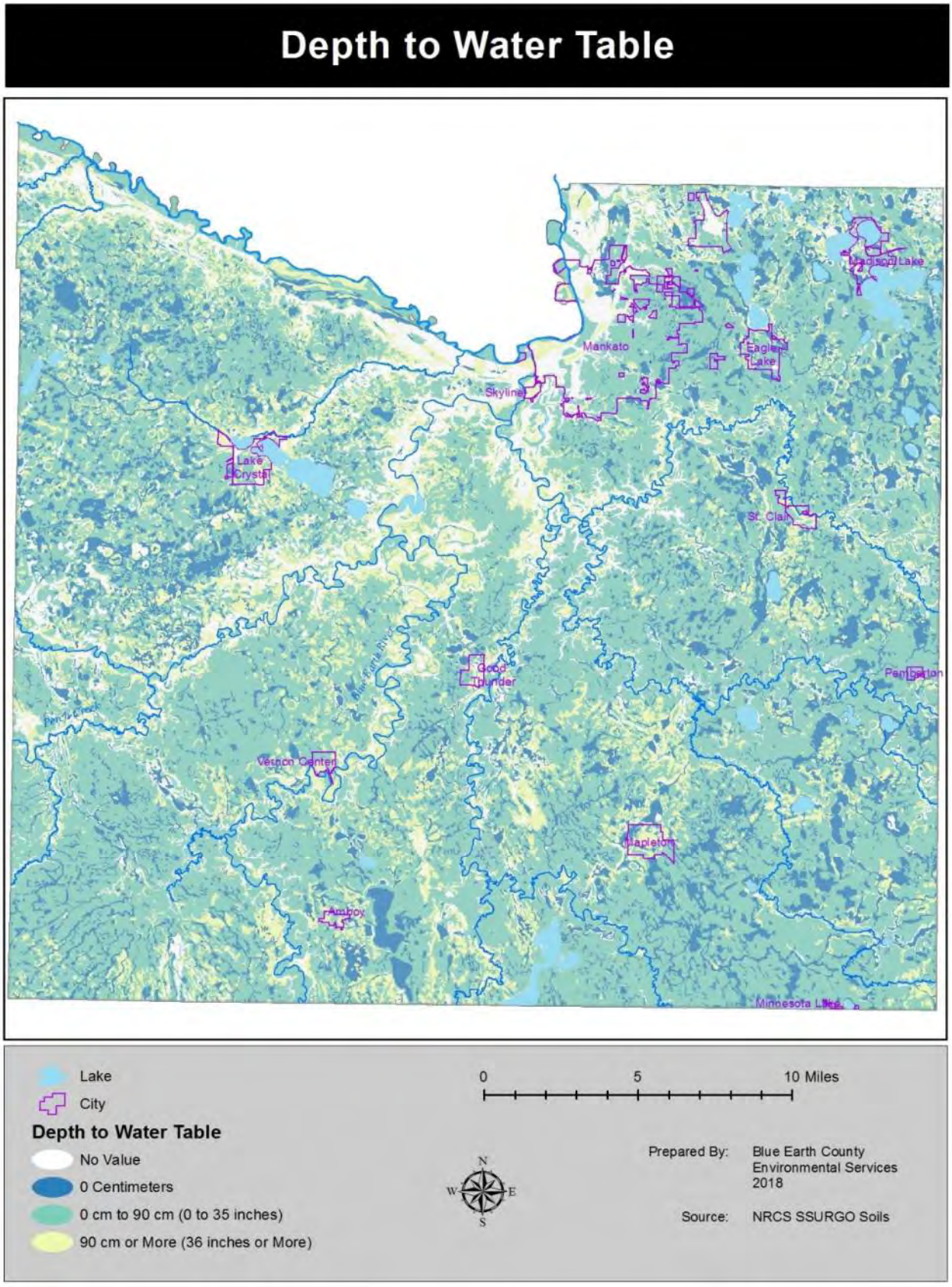
Soils in the County are generally fertile and well-suited for crop production but require artificial drainage to achieve maximum yields. Irrigation is not a wide spread practice for crop production but is utilized in some areas with coarse textured soils in the western parts of the County, along major rivers.

Soils characteristics and limitations influence land use management and conservation. A high-water table is the most common limiting factor of soils in the County. Just over 88 percent of the County has a depth to water table of 35 inches or less according to the USDA Soil Survey. Depth to water table is significant for all types of construction, subsurface sewage treatment systems and stormwater infiltration. Figure 9 shows the depth to water table of soils in the County.

Over 56 percent of the County has either poorly-drained or very poorly drained soils. The USDA 1978 Soil Survey of Blue Earth County states that “about 54 percent of the County is wet and requires artificial drainage for crop production.”

Hydric Soils are normally associated with wetlands. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils and predominately hydric soils make up 59 percent of the County. Most of the remaining soils can also have some hydric soil present. More than 90 percent of the pre-settlement wetlands in the County were drained for cropland and land development.

Figure 9: Depth to Water Table



Coarse-textured soils are located south and west of Lake Crystal, along the major rivers and in the shoreland areas of some lakes in the County. Coarse-textured soils are sensitive for nutrient management due to nutrients leaching downward beyond the root zone and have a wind erodibility index higher than most soils in the County. Irrigation of crops is most common on the coarse textured soils of the County.

The depth of soils to bedrock varies throughout the County with the shallowest depth to bedrock along the Minnesota River and the lowest reaches of the Blue Earth, Watonwan, Le Sueur and Maple rivers, where the depth to bedrock ranges from 1 to 50 feet. The depth to bedrock in most of the County is more than 100 feet.

The USDA Soil Survey provides general information about soils in the County. Maps in Appendix A show general soil texture, wind erodibility, depth to water table, hydrologic soil group, hydric soils, drainage class, and soils sensitive for nutrient management.

Geology

The two-part *Geologic Atlas of Blue Earth County* was recently updated by the Minnesota Department of Natural Resources and Minnesota Geological Survey. Part A includes a series of maps that display bedrock geology, surficial geology, quaternary stratigraphy, sand distribution models, bedrock topography and depth to bedrock. Part A should be used for detailed site analysis. Part B, includes an analysis of pollution sensitivity and an evaluation of the recharge rate of surface water into the water-table aquifer, seven buried sand aquifers, and the uppermost bedrock aquifers. Part B is intended to help citizens and local governments understand the geologic setting and inherent pollution sensitivity of the aquifers in the County. This information can then potentially be used to make land-use decisions that take aquifer sensitivity, water quality, and sustainability into account.

The Minnesota Department of Natural Resources Mining and Minerals has mapped the availability of aggregate resources in Blue Earth County. More information about mining and a map of aggregate resources in the County is addressed in Chapter 6 Land Use.

Groundwater

Groundwater is of high quality throughout the County, and there is good availability of groundwater from bedrock aquifers. When compared with other natural resource needs and services, reliable access to good quality drinking water is the number one priority for most people. Land use planning and management have an in important role in protecting groundwater resources to ensure long term sustainability of good quality groundwater supplies. To protect groundwater, land development for home occupations, commercial and industrial uses and wastewater treatment in areas without publicly-owned wastewater treatment should be managed in areas with high to moderate pollution sensitivity and karst. Protecting the quantity and quality of groundwater in the County is addressed in Chapter 5 Community Resilience and Appendix G.

Surface Waters

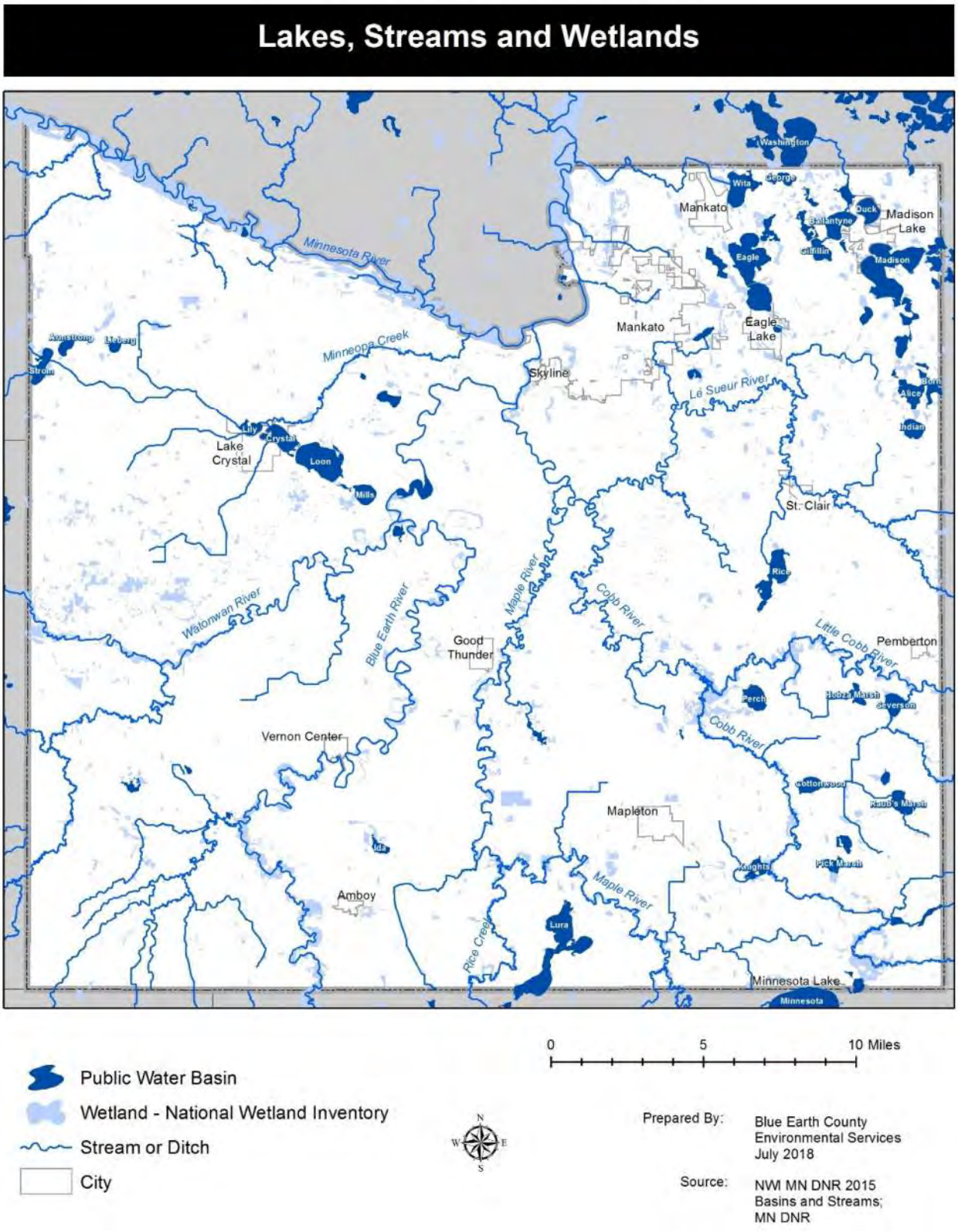
Lakes, rivers and wetlands occupy approximately eight percent of Blue Earth County. Figure 10 displays these features in the County.

Major Watersheds

More than 99 percent of Blue Earth County is in the Minnesota River Basin. Most of the County is in four major watersheds: Blue Earth, Le Sueur, Watonwan and Middle Minnesota. The confluences of all four rivers are in Blue Earth County. The Blue Earth River and its tributaries drain 75 percent of Blue Earth County. Combined with drainage from eleven counties in Minnesota and part of Iowa, the Blue Earth River watershed drains 775,590 acres

to its confluence with the Minnesota River in the City of Mankato. Two-square miles in the northeast corner of the County drains northeast to the Cannon River watershed.

Figure 10: Lakes, Rivers and Wetlands in Blue Earth County



Surface Water Quality

Many state agencies monitor river and lake water quality in local watersheds. The Minnesota Pollution Control Agency (MPCA) is responsible for developing water quality standards to protect designated uses of water bodies. Water quality standards vary depending on the part of the state the water body is located to account for differences in watersheds and the natural background of water bodies.

The MPCA developed an Impaired Waters List of water bodies and stream reaches that do not meet water quality standards. In Blue Earth County, most rivers, streams and lakes that have been assessed by the MPCA are on the Impaired Waters List because they do not meet standards for aquatic recreation or aquatic life due to excess nutrients, suspended sediment or bacteria. Of the lakes assessed by the MPCA, Lake Ballantyne, Duck Lake and Madison Lake have the best water quality of the lakes in the County. Waters impaired for aquatic recreation are not suitable for swimming and other forms of recreation. Waters impaired for aquatic life are unable to maintain healthy, diverse and successfully reproducing populations of aquatic organisms, including fish.

Rivers

There are 368 miles of rivers in the County - approximately the same distance of the Minnesota River - and 186 miles of unnamed streams. The major rivers in the County and their tributaries are identified in Table 7.

Table 7: Major Rivers in the County and their Tributaries

Major River	Minnesota River	Le Sueur River	Blue Earth River	Watonwan River
Tributaries	• Minneopa Creek • Morgan Creek • Little Cottonwood River • Indian Creek • Many unnamed streams	• Maple River • Cobb River • Little Cobb River • Rice Creek	• Willow Creek	• Perch Creek

Drainage Systems

The Blue Earth County Drainage Authority manages 696 miles of drainage systems in the County including 162 miles of open ditches and 534 miles of tile ditches, draining 53 percent of land in the County. Much of the remaining cropland is drained with private ditches and subsurface tile drainage that discharge directly to ravines, rivers, lakes and wetlands. Land in municipalities is drained to storm sewer drainage systems that also discharge to ravines, rivers, lakes, wetlands, and stormwater ponds.

Lakes

There are 43 lakes in the County. All are important for active or passive recreation. Many lakes in the County are used by MNDNR for fish rearing. The largest lakes are Madison, Loon, Eagle and Lura. Lakes with the most shoreland development are Madison, Duck, Ballantyne, Crystal, Loon and Lily.

Wetlands

Conversion of the landscape to cities, towns, roads, farmsteads and agricultural uses required wetland drainage and removing native vegetation from the native tall grass prairie and woodlands. The MPCA reported that counties in southern Minnesota have lost an average of 95% of their wetlands since European settlement[1]. This has

[1] Minnesota Pollution Control Agency, *The state of wetlands*, https://www.pca.state.mn.us/water/state-wetlands [Accessed 15 August 2018]

contributed to the impaired water quality in streams and lakes in the region, loss of fish and wildlife habitat, and has altered hydrology.

The National Wetlands Inventory (NWI) is the only available map of known wetlands in the County. The NWI includes 47,344 wetland acres in the County (see Figure 11). There are limitations to using the NWI for land use planning and management. The NWI does not show all wetlands in the County nor does it show the regulatory boundaries of wetlands. However, the NWI provides a general idea of the location of wetlands that can be used prior to the completion of a wetland delineation. When a field survey is completed for a delineation the boundaries are typically different than the boundaries defined by NWI. Many wetlands in cultivated fields and some smaller wetlands were excluded from the NWI. Wetlands in wooded areas were either not mapped in the NWI or the regulatory boundaries are much larger or smaller than shown in the NWI.

A definition of wetlands

The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

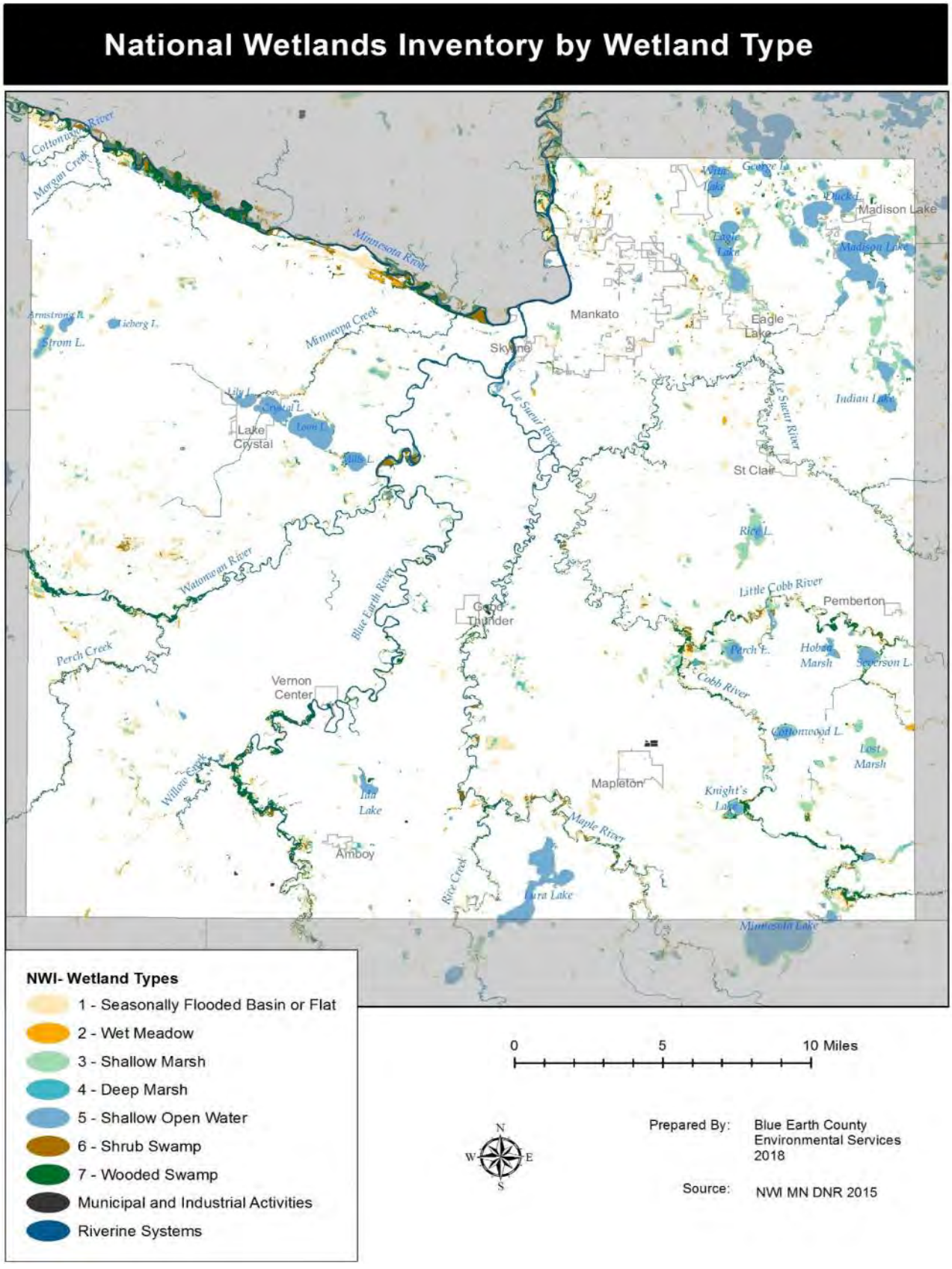
Source: Clean Water Act (33 CFR328.3(b); 1984)

Wetland Regulations

Specific regulation of activities that may impact individual wetlands are based on wetland boundary delineations and evaluation of the proposed activities as required by the Minnesota Wetland Conservation Act (WCA), and Federal Laws administered by the United States Army Corps of Engineers and the MPCA. Blue Earth County and the City of Mankato administer the WCA in the County.

The Blue Earth County Water Management Plan includes a locally-defined, science- based, wetland management framework that was developed to pre-determine and classify wetlands based on local public values and the Greenprint. The plan and framework may be used to vary Wetland Conservation Act requirements for sequencing, replacement siting, ratios and other standards to streamline WCA administration by using the wetland classification framework.

Figure 11: National Wetland Inventory by Wetland Type



Greenprint

The Blue Earth County Greenprint is a map of green infrastructure in the County. Priority areas include river corridors, lake shoreland, wetland complexes and other planned natural resource corridors. Protecting natural resources and open spaces in Greenprint priority areas is a land use management priority and should be integrated in land use decisions and local recreation, transportation and land use plans and updates at the local and watershed scale.

The Greenprint consists of strategically planned, interconnected networks of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, trails; conservation lands; and other open spaces that support natural ecosystem processes and contributes to the health and quality of life for communities and people in the County.

A land use planning approach was used to identify Greenprint priority areas based on the ability to provide multiple aquatic and natural resource benefits. An inventory of aquatic and natural resources, sensitive features, land cover, floodplains, rivers, streams, lakes, wetlands, rare plant and animal habitat, sensitive geology, park lands, and protected or publicly-owned lands was followed by an analysis of their landscape position, proximity and connectivity in four landscape settings - river corridors, shallow bedrock and karst, lake shoreland and wetland complexes. These diverse landscape settings, natural resources and hydrologic conditions were combined to make the Greenprint.

The Blue Earth County Greenprint was developed over many years and was adopted as part of the Blue Earth County Water Management Plan. The Greenprint does not show all priority areas or natural resources in the County. A description of the Greenprint and criteria used for its development are in Appendix F. Figure 12 shows a generalized Greenprint map of the County.

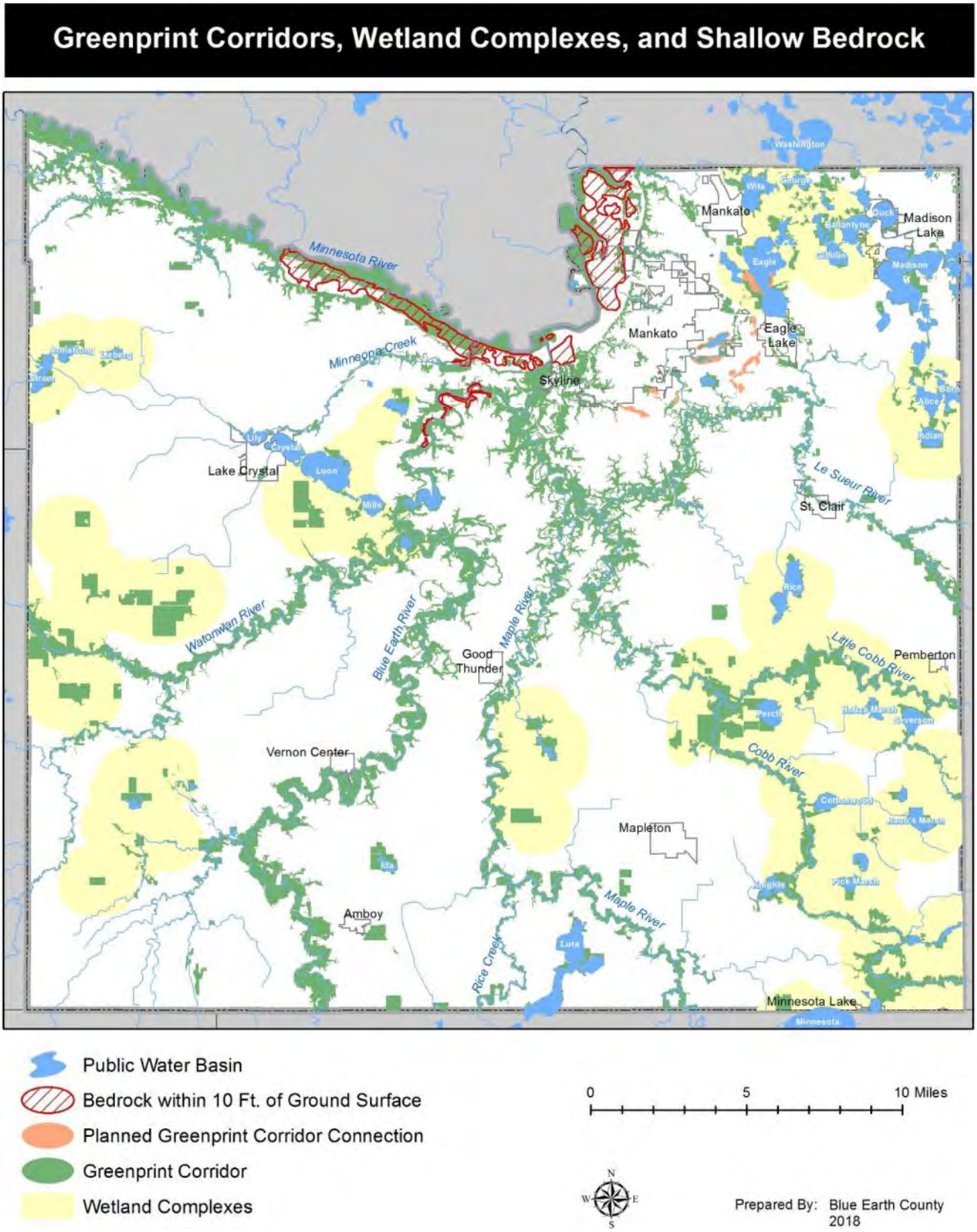
Green Infrastructure

Green infrastructure is a strategically planned, interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, trails; conservation lands; and other open spaces that support natural ecosystem processes and contributes to the health and quality of life for communities and people.

Green infrastructure is an organizational strategy that provides a planning framework for conservation and development.

Adapted from: Green Infrastructure: Smart Conservation for the 21st Century
Mark A. Benedict and Edward T. McMahon and ESRI

Figure 12: Greenprint Map, 2018



Lakes

Lakes in the County are important natural resources that provide opportunities for recreation and provide important natural resource functions for wildlife habitat, fisheries and water storage. Shoreland development typically results in loss of habitat and increased runoff and nutrients to lakes compared to undeveloped shoreland.

As described in the Blue Earth County Greenprint and Water Management Plan, the near shore area is critical for wildlife habitat and fisheries. A natural shoreline is more than an aesthetic buffer for the water; it is a complex ecosystem that provides critical habitat for fish and wildlife and protects water quality. Near shore wetlands and aquatic plants protect the shore from high water, erosion from waves and ice dams, and provide habitat. Often, shoreline development results in the loss of these essential shoreline protection buffers and habitat.

Wetlands connected to lakes and in the near shore area provide critical wildlife habitat, water storage and water quality benefits.

Many wildlife species are highly dependent on naturally vegetated shorelines and adjacent wetlands as habitat for feeding, resting, and mating and as nursery areas for juvenile life stages. Green frogs are shoreline-dependent species that prefer quiet bays and protected areas with a high abundance of aquatic plants. Male green frogs establish breeding territories within two feet from the lake edge.

Shoreland Impacts

"On average, there is a 66% reduction in aquatic vegetation coverage with shoreland development."

"Structures and turf-grass lawns have replaced natural shores along many lakes and have had adverse impacts on water quality and the diverse wildlife that depend on a natural shore. Rainwater runoff from manicured lawns can be 5 times to 10 times higher than natural shorelines, and runoff from turf lawns can carry up to 9 times more phosphorus to the lake than runoff from natural shorelines."

Source: Minnesota Conservation Plan

Many fish depend on aquatic vegetation, woody habitat, and shorelines to provide spawning habitat, cover, and refuge from predators. Wetlands are critical for northern pike spawning. Downed trees provide important in-lake structure, habitat, food, and shelter for fishes, frogs, turtles, water birds, and mammals. Turtles need to bask on deadfalls or floating logs. Woody habitat is also important for aquatic invertebrates.

Shoreline buffers are corridors of natural vegetation along rivers, lakes, wetlands and sinkholes that protect water quality by trapping, filtering, and impeding runoff laden with nutrients, sediments, and other pollutants. Shoreline buffers also stabilize banks, screen shoreland development, reduce erosion, and provide critical habitat for aquatic and terrestrial wildlife.

Protecting shoreland areas with buffers of natural vegetation, wetlands, and stormwater runoff management that treats and retains runoff is critical for protecting wildlife, fisheries and lakes water quality.

Rivers

There are 368 miles of rivers in the County, approximately the same distance of the Minnesota River and 186 miles of unnamed streams.

As described in the Blue Earth County Greenprint and Water Management Plan, river corridors in the County contain a continuous band of floodplains, riparian habitat, wooded and grassy hillsides, marshes and swamps. This variety of landscapes provides excellent habitat for a wide variety of terrestrial and aquatic wildlife species.

River corridors are the least disturbed ecosystem in the County, and aquatic and terrestrial habitat connectivity is greatest in river corridors. The Minnesota County Biological Survey maps outstanding, high and moderate value sites throughout the County and a majority are in river corridors. Nearly half of the wetlands in the County are in river corridors, and most of forested lands are in or adjacent to river corridors. The highest quality and greatest diversity of wetlands in the County are in the river corridors.

Shallow depth to bedrock, karst and areas with high groundwater pollution susceptibility in the County naturally extend from river corridors along the Minnesota River and in the lower reaches of the Blue Earth and Le Sueur Rivers. Fens are in these areas, and one Calcareous Fen was located by the MNDNR in the Minnesota River corridor.

River corridors in the County are viewed as being attractive for development. However, river channels are widening, and some areas are susceptible to near channel erosion and landslides. Riverine and flash flooding is also a land use concern in river corridors. Most of the aggregate and stone quarries in the County are along rivers and river corridors.

Wetlands

Wetlands provide important functions of public value because they use and filter nutrients, retain water, reduce flooding, provide fish and wildlife habitat, protect shoreland areas from waves, currents and ice dams, and recharge water supplies. Wetlands also provide recreational opportunities and aesthetic benefits. While all wetlands provide important functions for people and wildlife, human values and priorities drive policy and management decisions. Restoration of the pre-settlement landscape or protecting all wetlands is not desirable or consistent with current land uses. At the same time there is interest in protecting, enhancing and restoring wetlands in the County to provide wildlife habitat, recreation, improve water quality and retain water in a way that serves multiple interests.

Wetland Protection

Wetland storage capacity and other wetland functions are diminished by human activities. In agricultural and developed areas of the County, buffers between wetlands and adjacent upland uses is typically low, and wetlands are impacted by drainage, altered hydrology, excess nutrients, and sedimentation.

Buffers reduce the impacts of surrounding land uses on wetland functions by stabilizing soils to prevent erosion; filtering solids, nutrients, and other harmful substances; and moderating water level fluctuations during storms. Buffers also provide essential habitat for wildlife since many animal species require both wetland and upland habitats as part of their life cycles and require opportunities to move to escape predators or find food and cover. Wetlands and buffers in shoreland areas protect the shore from erosion by waves and ice dams and provide habitat.

The Army Corps of Engineers (USACE) St. Paul District and the MPCA recommend varying the width of upland buffer depending upon the goals for the site (e.g., water quality, wildlife habitat), adjacent land use (golf fairway vs. parking lot), slope (steep vs. gentle), vegetation and soils. Minimum wetland buffers recommended are:

- 50 feet for reduction of human impact
- 50 to 100 feet for overall water quality protection
- 50 to 200 feet for habitat protection and species diversity

The USACE describes some of the problems with wetlands that lack upland buffer protection in the A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Prairie Potholes (HGM):

> "Accelerated sedimentation may be the most detrimental impact on wetlands. Accumulation of sediment in wetlands decreases wetland volume, decreases the duration wetlands retain water, and changes plant community structure by burial of seed banks."

Wetland Protection and Management Strategies

Blue Earth County subdivision and shoreland ordinances require construction or land alteration activities to avoid a net increase in impervious surfaces that drain to surface waters or wetlands, the relocation of impervious surfaces closer to wetlands, or changes to drainage patterns (slopes, meander patterns, etc.) that increase the velocity or rate of runoff to wetlands. Graded slopes adjacent to wetland protection areas should be no steeper than 3:1 and protected to control erosion and sediment runoff to the wetland.

Blue Earth County requires a one-rod (16.5 feet) buffer around delineated wetlands in new subdivisions, and the City of Mankato requires a 16.5-foot building setback from wetlands. Structural setbacks and protection of the shoreland areas of Public Waters and Public Waters Wetlands are greater than 16.5 feet and are regulated by municipal and County shoreland ordinances in accordance with Minnesota Rules, part 6120.

Wetland Dedication

As described in the Blue Earth County Water Management Plan, the County and other local governments in the County currently require park dedication of land or payment of fees in lieu of land dedication. Minnesota Statutes 2017, section 394.25 Subdivision 7 allows counties and Minnesota Statutes 2017, Section 462.358 Subdivision 2b allows municipalities to require that a portion of any proposed subdivision be dedicated to the public or preserved for public use as parks, recreational facilities, playgrounds, trails, wetlands or open space. Any cash payments received in lieu of dedication must be used only for the acquisition of development or improvement of parks,

recreational facilities, playgrounds, trails, wetlands or open space, in accordance with a park and open space plan adopted by the County or in a comprehensive plan. The Blue Earth County Greenprint and Water Management Plan may be used to support open space and wetland dedication. The Greenprint is included in Appendix F.

Climate and Precipitation

The National Oceanic and Atmospheric Administration (NOAA) computes "Climate Normals." Climate Normals are utilized in seemingly countless applications across a variety of sectors. These include regulation of power companies, energy load forecasting, crop selection and planting times, construction planning, building design, and many others.

The NOAA 1981 -2010 Climate Normals are the latest three-decade averages of climatological variables, including temperature and precipitation. The statistic is a measure of the central tendency of the variable. NOAA Climate Normals have been determined for the City of Amboy and the City of Mankato. The 1981-2010 Climate Normals show Amboy is slightly warmer annually (1.1 degrees) than Mankato, and Mankato receives slightly more precipitation annually (0.86 inches) than Amboy.

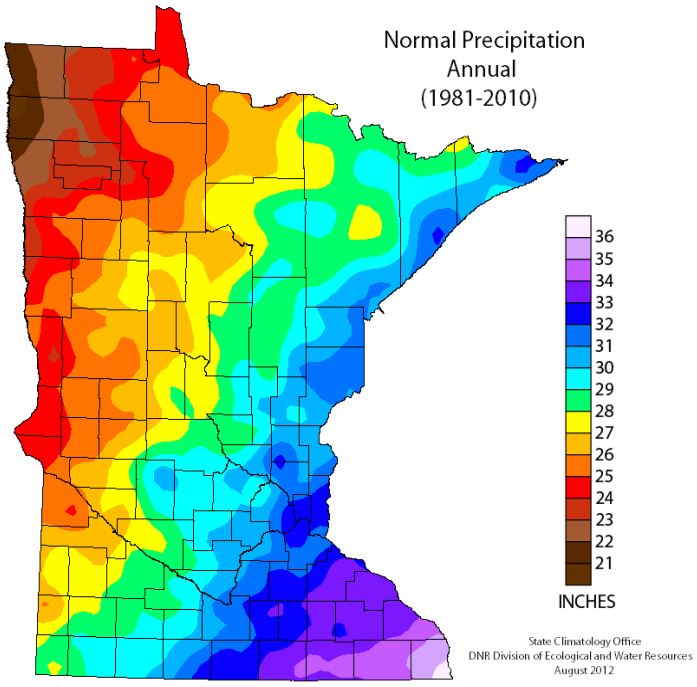
Minnesota's highly variable climate leads to large year-to-year swings above and below this benchmark value. Temperatures can drop to the -35° F record low set February 2, 1996 or reach the record high of 107° F set August 1, 1988. This seasonal, wide range in temperatures impacts construction activities, vegetation and wildlife.

Table 8: Mankato and Amboy Annual/Seasonal Normals

	Precipitation (In)	Minimum Temperature (°F)	Average Temperature(°F)	Maximum Temperature (°F)
Annual				
Mankato	32.30	34.8	45.4	55.9
Amboy	31.44	35.5	46.5	57.5
Winter				
Mankato	2.77	8.4	17.7	27.1
Amboy	2.60	9.0	18.7	28.3
Summer				
Mankato	13.59	59.2	70.0	80.9
Amboy	13.17	59.5	71.1	82.6
Spring				
Mankato	8.47	34.4	45.5	56.5
Amboy	8.56	35.5	46.9	58.3
Autumn				
Mankato	7.47	36.8	47.7	58.5
Amboy	7.11	37.7	48.9	60.2

Source: National Oceanic and Atmospheric Administration (NOAA) 1981 -2010 Climate Normals

Figure 13: State of Minnesota, Normal Annual Precipitation (1981-2010)



Source: State Climatology Office, MNDNR, 2012

The normal annual precipitation in the County is between 30-inches in the western third of the County and 32-inches in the eastern corner of the County, according to the State Climatology Office normal annual precipitation for Minnesota for the period of 1981 to 2010. In the previous thirty-year period of 1951 to 1980, the annual precipitation for the County was in the 27 to 29-inch range.

While total precipitation is important, the timing, frequency, duration, and amount of the precipitation are significant locally for industries like agriculture and for stormwater management planning. The National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 Precipitation Frequency was updated in 2013. It has replaced the National Weather Service's Technical Paper 40 as the guidelines for processes modelling, planning, engineering, and storm water design.

In Blue Earth County, the greatest change in precipitation are from larger storm events. The 100-year rain event increased by just over 21% to 7.41 inches and the 50-year rain event increased by 16.4% to 6.4 inches. These changes reflect the trend in the region as more rain comes in heavy downpours. According to NOAA, the region has seen a 46-percent increase in heavy rainfall events (rain events of more than 2 inches in 48-hours). These changes create challenges in water resource management and community resilience to flooding, near channel erosion and water quality.

Table 9: Average Amount and Frequency for 24-Hour Rainfall Events in Blue Earth County

Average Recurrence Interval	Technical Paper 40 (1961) Rainfall Amount (in)	NOAA Atlas 14 (2013) Rainfall Amount (in)	Difference (in)	Percent Change
1-year	2.4	2.51	0.11	4.6%
2-year	2.9	2.92	0.02	0.7%
5-Year	3.7	3.68	-0.02	-0.5%
10-Year	4.3	4.37	0.07	1.6%
25-Year	4.9	5.47	0.57	11.6%
50-Year	5.5	6.4	0.9	16.4%
100-Year	6.1	7.41	1.31	21.5%

Source: State Climatology Office, MNDNR, 2013

Topography

The topographic relief in Blue Earth County varies greatly. The topography is the product of a back-wasting continental glacier. Most of the County is generally level on what was Glacial Lake Minnesota which covered most of the County except for the northeast and northwest corners. There is gentle to rolling topography in the northeast corner of the County formed by glacial ground and end moraines.

Steep slopes, ravines and bluffs are common along the County's deeply-incised river systems. The incision of these rivers is the result of a profound landscape altering event when Glacial Lake Agassiz drained creating Glacial River Warren, the Minnesota River valley today. The Minnesota River valley is incised 230 feet at its confluence with the Blue Earth River in Mankato. The rivers in the County and their tributaries continue to incise toward the lower base level of the Minnesota River. Bedrock is exposed along the Minnesota River and in the lower reaches of the Minnesota River tributaries in the County. River incision will be an ongoing process. Steepness in river corridors and ravines predisposes these features to erosion and landslides.

The highest elevation in the County is 1,202 feet above mean sea level in Section 24 Jamestown Township, and the lowest elevation is 746 feet above mean sea level in the northwest corner of Lime Township along the Minnesota River.

Chapter 5 - Community Resilience

Blue Earth County and local community comprehensive plans address the projected population and demographic changes in many ways. A critical facet in all aspects of planning for any size population should include consideration of risks and vulnerabilities inherent to Blue Earth County communities and their level of emergency response capabilities.

Preparing communities to be resilient to disasters takes place at both the household and workplace as well as at the local and County level. History has shown that Blue Earth County is vulnerable to the effects of natural disasters such as extreme temperatures, extreme precipitation events, high winds, floods, tornadoes, winter storms and fires. Blue Earth County is also vulnerable to a variety of human-caused hazards such as major transportation accidents, civil disorder, terrorism, and hazardous material release which may present risks to the community through potential exposures in the air, surface water, groundwater or soil. An important aspect of community resilience is maintaining infrastructure, both manmade and natural systems, as well as critical facilities.

The implementation of mitigation projects increases the resilience of a community by reducing or eliminating negative financial, emotional, and social implications caused by a disaster. Blue Earth County Sheriff's Office maintains an Emergency Operations Plan (EOP) to address planning for, responding to, and recovering from disasters within the County. In addition, a Countywide All Hazard Mitigation Plan is kept up to date and compliant with FEMA and Minnesota Department of Homeland Security and Emergency Management requirements.

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards (44 CFR 201.2). Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

Source: Blue Earth County All Hazard Mitigation Plan

Blue Earth County All Hazard Mitigation Plan

The Blue Earth County All Hazard Mitigation Plan and the Blue Earth County Water Management Plan recommend actions and mitigation strategies be incorporated into applicable plans and ordinances such as zoning shoreland and floodplain ordinances, building codes, and waste water treatment policies. The potential hazards most related to land use planning are floods, tornados, near-channel erosion and landslides, and hazardous materials releases.

The goals and objectives in the Blue Earth County All Hazard Mitigation Plan are categorized by six mitigation measure categories. The prevention, natural resources protection and structural improvements hazard mitigation strategies relate closely to the Land Use Plan and can support the goals and policies in the Blue Earth County All Hazard Mitigation Plan. The six mitigation measure categories are:

- ***Prevention:*** 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.
- ***Natural Resource 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.

- ***Structural Improvements:*** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.
- ***Public Education and Awareness:*** 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.
- ***Property Protection:*** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.
- ***Emergency Services:*** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

Vulnerable Populations

Vulnerable populations are those citizens and residents that may require special assistance during a hazard event. These populations include children, elderly, hospitalized persons, and non-English speaking persons. Nursing homes, assisted living facilities and the hospital are in municipalities, and there is one nursing home in South Bend Township. There are 16,401 children under age 19 and 7,562 people 65 years or older in the County, according to the United State Census Bureau, 2010 Decennial Census. The United State Census Bureau, 2016 American Community Survey, indicates 6.4 percent of the County population "sometimes or always" speaks a language other than English at home.

Essential Facilities

Essential facilities are vital to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include: medical facilities (hospitals and clinics), police and fire stations, emergency operations centers, and schools. In Blue Earth County, these essential facilities are in municipalities, and every municipality has at least one essential facility. Some of the townships in the County also have town halls or other facilities that could be used following hazard events.

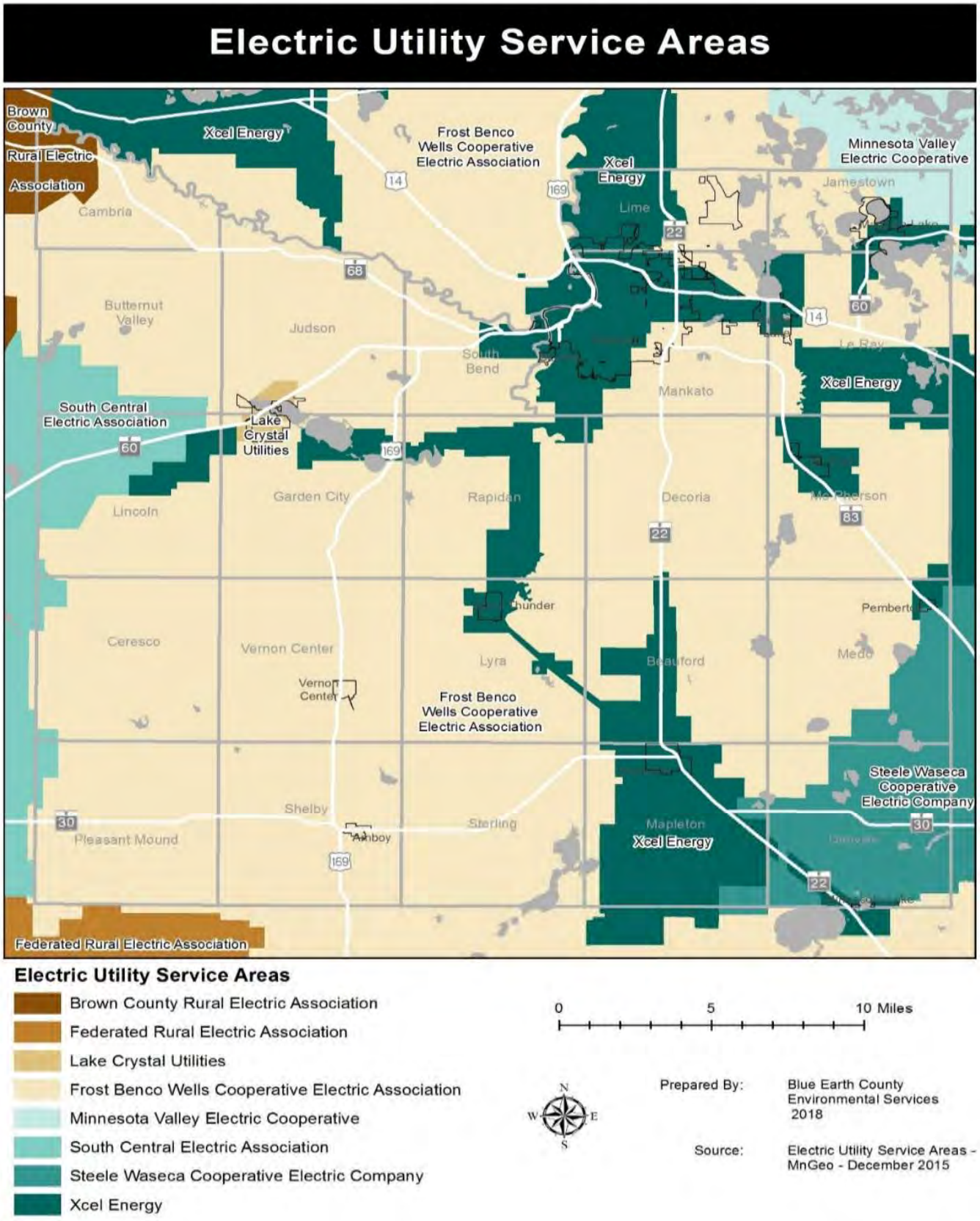
Infrastructure and Utilities

One of the most important aspects of maintaining a resilient community is maintaining a strong physical, social and economic infrastructure. Lifeline utility systems are essential for the provision of basic services such as heat, power, and potable water. These systems include the facilities and infrastructure related to: electric power, potable water, wastewater, stormwater, natural gas, and oil. Our physical infrastructure, both natural and manmade, is at risk from flood events, precipitation changes and other climate trends.

Natural Gas and Electricity

Buildings and industrial processes in Blue Earth County primarily use electricity and natural gas as energy sources. Electricity is used for appliances, water and space heating, lighting and other electronic devices. Natural gas is primarily used for water and space heating, cooking, and some industrial processes. Depending on location and availability of natural gas, propane is used for water and space heating, as a primary or secondary source of fuel. Figure 14 shows the electric utility service areas.

Figure 14: Electric Utility Service Areas



Electricity

The following is a list of electric service providers to users in Blue Earth County:

- Frost Benco Wells Cooperative Electric Association
- Xcel Energy
- Brown County Rural Electric Association
- Lake Crystal
- Minnesota Valley Electric Cooperative
- South Central Electric Association
- Steele-Waseca Cooperative Electric Company
- Federated Rural Electric Association

Xcel Energy operates the Wilmarth refuse derived fuel (RDF) electric power plant in Mankato. The Wilmarth Power Plant was built in the 1940 as a coal-fired power plant. In 1987 the plant was converted to burn RDF. The 26-megawatt power plant produces enough electricity from RDF to power about 20,000 homes. As part of the Blue Earth County Solid Waste Plan waste management hierarchy, solid waste from the County is transferred to a processing facility in Newport, Minnesota, along with other counties in the region and metro area counties using the facility.

Renewable Energy Resources

Across the nation there is an increasing demand for renewable energy. As the worldwide debate continues regarding the long-term effects of continued reliance on fossil fuels, Blue Earth County has an opportunity to provide its residents with alternative options for powering their homes and businesses, although the Rapidan Dam continues to generate alternative energy. Future renewable energy in this part of the state is centered around two main options, wind and solar.

Blue Earth County formally adopted a Wind Energy Conversion System Ordinance in 2003 and a Solar Energy System Ordinance in 2015. These two Ordinances provide the residents of the County with the ability to institute either Commercial or Non-commercial wind and/or solar projects on their property. The inclusion of these alternative energy options into the County's Zoning Ordinance has led to construction of large solar energy systems which support the larger power grid and several smaller solar energy systems which serve individual homes.

Several characteristics should be in place to create a good alternative energy site for wind or solar conversion. Foremost, an abundance of the resource must be available on the site for capture. For example, a heavily treed area with lots of shade or wind obstructions may not be suitable to support alternative energy production. Soil conditions also need to be reviewed to ensure no wetlands are negatively impacted and

the area can support the weight and stability of the energy system. In addition, access to a public road will be necessary for future maintenance; and for the large systems, proximity to a connection point on the existing power grid will be required.

As the County continues to view these renewable energy systems as a benefit to the environment and its residents, it is also important to note that not all residents view these systems as positive additions to the area. Some residents may not view the addition of a large solar energy system or large wind turbines as aesthetically pleasing and may not want to live near them. It is important for the County to continue to provide an avenue for its residents and businesses to use renewable energy. However, it is also important that the County continually reviews its performance standards and their impacts to neighboring property owners.

Although wind and solar are currently the predominant sources for renewable energy in Blue Earth County, as technological advances are achieved, one could expect other renewable energy opportunities to be developed. The County should monitor and research these opportunities as they become available.

Biomass

Fuel derived from biomass can be used to generate renewable electricity, waste heat, and gas. Biomass resources include municipal solid waste, landfill gas, wood waste, agricultural byproducts, food processing residue and other organic waste. There is one ethanol plant in the County located off Highway 60 near Lake Crystal.

Waste Management

Municipal solid waste (MSW) generation in Blue Earth County continues to grow with residential and business waste generated in the County increasing with population and business growth. MSW includes garbage, recyclables, yard waste, household hazardous waste, and bulky waste such as furniture.

In 1980, the Waste Management Act (MN Stat 115A) was passed to improve integrated solid waste management and establish a hierarchy order of preference for the management of waste. The Blue Earth County Integrated Waste Management system uses a variety of management techniques to reduce the amount (volume) and the harmfulness (toxicity) of waste disposal in the County. The integrated system is a partnership between public and private entities to provide a complete system for managing waste. Components include:

1. Education to explain waste reduction, reuse, and recycling,
2. Recycling,
3. Household hazardous waste disposal to reduce toxicity of the garbage produced,
4. Resource recovery processing and incineration/electrical production, and
5. Landfilling waste material that cannot be processed (residual waste) or which is not required to be taken through the Integrated System to Resource Recovery. Construction and demolition waste can be disposed of at a demolition landfill.

Table 10: Solid Waste Disposal and Integrated Waste Facilities

Owner	Description	Location
Waste Management	Blue Earth County Recycling Center	South Bend Township
Southern Minnesota Construction	Compost Site	Mankato
Southern Minnesota Construction	The Pilgrim Demolition Landfill	Mankato
Blue Earth County	Household Hazardous Waste Facility	Mankato
Blue Earth County	Ponderosa Landfill	South Bend Township
Minnesota Waste Processing Company	Privately owned transfer station	Mankato
Xcel Energy	Wilmarth Power Plant	Mankato
Xcel Energy	Wilmarth Ash Landfill	South Bend Township

Source: Blue Earth County, Environmental Services

Groundwater Supplies

Most public and private supplies are sourced from groundwater aquifers. Groundwater is of high quality throughout the County, and there is good availability of groundwater from bedrock aquifers. When compared with other natural resource needs and services, reliable access to good quality drinking water is the number one priority for most people. Land use planning and management have an in important role in protecting groundwater resources to ensure long term sustainability of good quality groundwater supplies. Land development should be managed in areas with high to moderate pollution sensitivity and karst, when siting home occupations, commercial and industrial development and wastewater treatment in areas without publicly-owned wastewater treatment.

Groundwater Contamination

Sources of groundwater contamination can include residential, commercial, and industrial hazardous materials and waste disposal; leaking above and underground petroleum tanks and pipelines; and dry wells and septic systems. Release of hazardous materials through spills or other means can pose a threat to groundwater and surface waters. Motor vehicle repair, new and used vehicle or farm machinery dealers and auto body shops where floor drains or sinks lead to a septic system, dry well or otherwise discharge into the ground are defined as EPA Class V injections wells and are banned. Car washes are also EPA Class V injection wells. Holding tanks may be required for these and other types of land uses where hazardous materials can enter groundwater through a septic system or other means.

Past land use practices and improperly handled hazardous materials have contaminated soil and groundwater used for drinking in localized areas of Blue Earth County. The largest occurrence of groundwater contamination in the County was in Le Hillier. In 1981, following a tip on the Minnesota Pollution Control Agency (MPCA) "hotline" about dumping of hazardous wastes in Le Hillier, groundwater contamination was verified, and Le Hillier became a Superfund site. Major contaminants detected were nitrates and volatile organic chemicals (VOCs), primarily trichloroethylene (TCE). South Bend Township received a grant to construct a water supply system and wells were ordered sealed. A wastewater collection system was constructed for Le Hillier for treatment at the City of Mankato's wastewater treatment plant. Le Hillier is no longer a Superfund site; however, a well construction advisory in the area remains in place.

Protecting groundwater with wellhead protection, well sealing and land use management are a high priority and are addressed in the Blue Earth County Water Management Plan and Blue Earth County All Hazard Mitigation Plan.

Water Wells

The most effective ways to protect groundwater and prevent well contamination are:

- Wise management, use, storage and disposal of hazardous substances
- Proper well construction
- Sealing of unused wells

Observing minimum isolation distances (also known as setback or separation distances) from contamination sources and well construction standards required under the Minnesota Well Code help ensure the quality of the well water remains high.

Wells do not last forever. Unused or abandoned wells that have not been properly sealed can provide a direct pathway for contaminants to enter the groundwater aquifers, potentially threatening groundwater quality in other wells. Abandoned wells are common in both older, developed areas of cities that are presently served by public water supplies and in older rural homesteads and farm fields where wells were located to serve former farmsteads or water livestock in pastures.

Blue Earth County is delegated by the MDH to administer Minnesota's Well Code. The Well Code establishes minimum standards for the location, construction, repair, and ultimate sealing (closure) of wells and borings in Minnesota, to protect public health and the state's invaluable groundwater. County staff handles all permitting and inspections of private and noncommunity wells in the County, ensures that new wells meet isolation distances from contaminant sources, and ensures that the required water tests are conducted by the well driller. The County addresses potential groundwater contamination from Class V injection wells when issuing land use permits by requiring holding tanks in most instances where publicly owned wastewater treatment systems are not available. Long term management and maintenance of wells to protect groundwater quality and ongoing well water testing is the responsibility of property owners.

Groundwater and drinking water protection are a high priority in the Blue Earth County Water Management Plan. The sections of the water plan addressing groundwater and drinking water are shown in Appendix G.

Water Use

Water use, and ground water recharge have become a growing concern as general awareness of the value and limited availability of quality ground water increases. Water use for production of ethanol and the cumulative amount of water used for livestock watering have raised concerns about groundwater across the state. There are also concerns about using deeper aquifers for snow making, lawn sprinkling and irrigating golf courses.

The Minnesota Department of Natural Resources (MNDNR) is responsible for monitoring the utilization of both the ground and surface water. MNDNR water appropriation permits are required when either a designated public surface water is affected, or the volume of groundwater exceeds either 10,000 gallons per day or 1 million gallons per year. In Blue Earth County public water supply wells, livestock watering and agricultural crop irrigation are the highest users of groundwater. Agricultural crop irrigation is most common in areas of the County with coarse textured soils and along rivers.

Groundwater Pollution Sensitivity and Groundwater Recharge

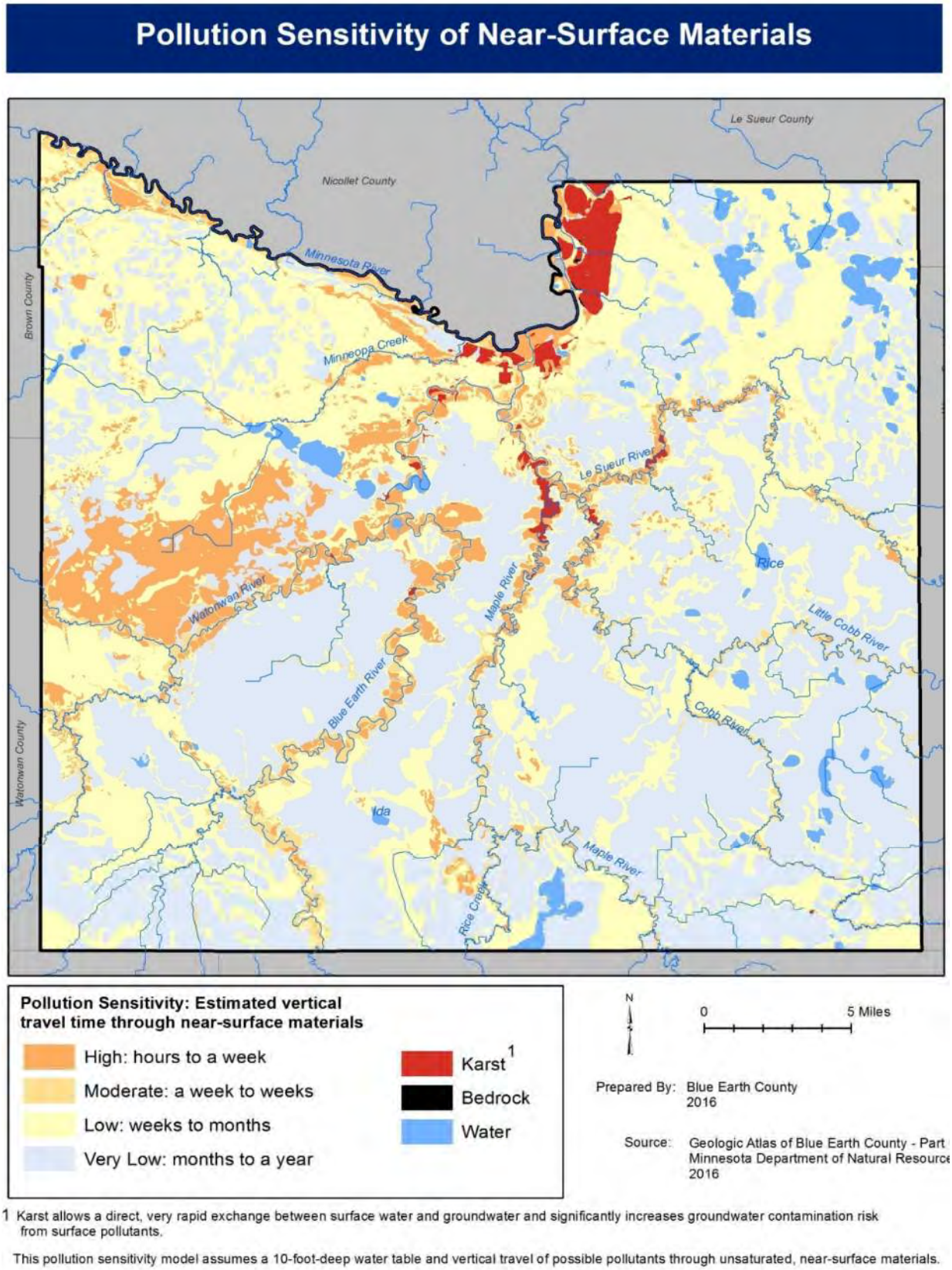
Groundwater protection and recharge are a high priority in the County and affect groundwater aquifers beyond County or watershed boundaries. The Geologic Atlas of Blue Earth County Part B includes an analysis of pollution sensitivity and an evaluation of the recharge rate of surface water into deeper aquifers. Part B is intended to help citizens and local governments understand the geologic setting and inherent pollution sensitivity of the aquifers in the County. This information can then potentially be used to make land use decisions that take aquifer sensitivity, water quality, and sustainability into account.

Pollution sensitivity is defined by the physical properties that affect downward migration of pollutants to the groundwater. The main variable is the rate that water travels from the surface to the aquifers. The travel times to buried aquifers vary from days to thousands of years. Areas with relatively short travel times of less than a few years are rated high or very high pollution sensitivity. Areas with estimated travel times of decades or longer are rated low or very low pollution sensitivity.

The Geologic Atlas of Blue Earth County Part B pollution sensitivity evaluations indicated that the water table, at an assumed depth of 10 feet below ground surface, generally had slow infiltration rates (weeks to a year) in the eastern and southern portions of the County resulting in low to very low pollution sensitivity ratings, except for the larger stream valleys. All the major river valleys and a large sandy area in the northwestern area of the County showed higher infiltration rates (a week to weeks) to the water table and therefore have a moderate to high sensitivity rating. (See Figure 14, Pollution Sensitivity of Near-Surface Materials) The major river valleys in the northern portion of the County (Watonwan, Blue Earth, Le Sueur, Maple, and Minnesota) showed moderate to very high sensitivity rating (pollutant infiltration rate of hours to decades) for most of the aquifers.

Many of the buried aquifers, ranging in depths from approximately 50 to 200 feet below ground surface, were interpreted to have generally low or very low sensitivity ratings with an interpreted vertical travel rate of a pollutant from decades to centuries or more, except for some shallowly buried portions. The highest rates of recharge for each of the aquifers is shown in a compilation map of “High” and “Very High” classes in which the vertical travel time for water to enter a buried sand and gravel aquifer is less than a year. (See maps of Pollution Sensitivity of Bedrock Surface, Pollution Sensitivity and Recharge of Buried Sand Aquifers and Pollution of Near-Surface Materials in Appendix A).

Figure 15: Pollution Sensitivity of Near-Surface Materials



1 Karst allows a direct, very rapid exchange between surface water and groundwater and significantly increases groundwater contamination risk from surface pollutants.

This pollution sensitivity model assumes a 10-foot-deep water table and vertical travel of possible pollutants through unsaturated, near-surface materials.

Public Water Supplies

A public water system is a system that contains at least 15 service connections or regularly serves at least 25 people for at least 60 days a year. A system that serves water 60 or mores day a year is considered to "regularly serve" water. Public water systems can be publicly or privately owned. Public water systems are subdivided into two categories: community and noncommunity water systems. This division is based on the type of consumer served and the frequency the consumer uses the water.

According to 2016 Minnesota Department of Health (MDH) data, there are 78 entities in the County that own 100 public water supply wells. The well owners include municipalities, rural subdivisions, commercial businesses, churches, parks, campgrounds, bar/restaurants, and golf courses. A high percentage of public water supply wells (62 wells) are in sensitive aquifers, and 22 wells are sensitive to groundwater contamination because the well does not meet current construction standards or there is no information about the well available. Most of these are transient noncommunity public water suppliers. Most municipal wells in the County are not in sensitive aquifers.

The MDH Community Water Supply Unit is responsible for assuring the compliance of community water supply systems with the Safe Drinking Water Act. At least one certified water operator is required at each community public water supply system.

Private Water Wells

Most of residential land uses in unincorporated areas of the County utilize private water wells for drinking water. Well owners are responsible for well maintenance and water testing to ensure a continued quality water supply.

Wastewater Treatment

Wastewater contains bacteria, pathogens, chemicals, nutrients, and solids. Untreated wastewater is a potential threat to public health and can pollute surface and ground water. A majority of the County's population (79 percent in 2014) and commercial and industrial uses are in one of the 11 municipalities utilizing State-permitted wastewater treatment facilities. Of the 11 municipalities in the County, seven own and operate their own MPCA-permitted, publicly owned treatment works (POTW) and three are partners with the City of Mankato.

Mankato's wastewater treatment plant serves the cities of Mankato, North Mankato, Eagle Lake, Madison Lake, Skyline, part of South Bend Township and the Lake Washington Sanitary District. Provision of wastewater treatment and other services in Lime Township, Mankato Township and South Bend Township are addressed in Orderly Annexation Agreements. To provide wastewater services to shoreland development around Duck Lake, Lake Ballantyne and Madison Lake, part of the shoreland areas were annexed to the City of Madison Lake and 399 parcels outside of city limits were annexed to the Lake Washington Sanitary District.

Regional wastewater treatment and sewer extensions can be costly to homeowners and entities providing the services. Recent individual costs to extend wastewater utilities to homeowners in the County has ranged from $25,000 in more densely populated areas to $60,000.

Subsurface Sewage Treatment Systems

Most wastewater in unincorporated areas of the County is treated in subsurface sewage treatment systems (SSTS). Treatment of wastewater in decentralized areas is the responsibility of the individual property owner. An estimated 5,000 seasonal and year-round dwellings, commercial, industrial, and public land uses utilize subsurface soil treatment systems (SSTS) in the County. SSTS are regulated by State Rules and County ordinance.

The County has required permits for septic systems for decades. Permit records have been maintained since 1972. Since 1972 the County has issued more than 6,000 permits for septic systems and holding tanks. Blue Earth County ordinances require compliance inspections for septic systems at the time of property transfer, with all applications for construction permits in shoreland areas, and conditional use permits or variance applications. In addition, compliance inspections are required in non-shoreland areas with an application for a construction permit if the septic system is more than 15 years old. Property owners may forgo the compliance inspection and install a new system.

Minnesota Rules and County ordinance requires the owner of the septic system to maintain their septic system at least every three years. The owner must hire a state-licensed maintenance contractor to determine if pumping the septic tank is needed to remove septage (scum, grease and sludge). While pumping septage, the contractor will assess whether the tank leaks. A good maintenance contractor will also check inspection pipes in the drainfield to assess overuse.

The quantity of septage removed from septic tanks each year is not tracked by the County, State or Federal government at this time. If all SSTS owners comply with state rules, an average of 1,500 of the estimated total 5,000 systems in the County will require pumping each year and the average tank capacity is 1,500 gallons. Using these assumptions, about 2,250,000 gallons of septage are pumped in the County each year.

Class V injection wells

Class V Injection Wells are regulated by the Federal government. Dry wells, cesspools, and septic system leach fields are examples of simple Class V wells. Because their construction often provides little or no pretreatment and these fluids are injected directly into or above an underground source of drinking water, proper management is important. A Class V well is used to inject non-hazardous fluids underground. Most Class V wells are "low-tech" and depend on gravity to drain fluids directly below the land surface. (Source: EPA)

Examples of "low-tech" Class V injection wells that typically rely on gravity drainage include:

- Motor vehicle disposal wells include vehicle repair home businesses, new and used car dealers, boat yards, auto body shops, farm machinery dealers, where service floor drains or sinks lead to a septic system or otherwise discharged into the ground. Motor vehicle disposal wells are banned. Holding tanks or sanitary sewer systems are required.
- Carwashes where wastewater enters a floor drain that leads to a dry well or septic system

The County addresses potential Class V injection wells when issuing land use permits. Holding tanks are required for some businesses.

Stormwater Management

Rainwater and snowmelt that does not evaporate or infiltrate into the ground becomes stormwater runoff. Stormwater runoff eventually drains to lakes, wetlands, rivers, and ravines. Managing stormwater is needed to prevent flooding of roads and property and is a concern Countywide due to the potential adverse effects of stormwater runoff. The County will ensure community resilience with stormwater management policies that effectively provide flood water and stormwater attenuation to prevent flooding and protect water quality.

Impervious surfaces, site grading and drainage can alter hydrology and increase the rate and volume of stormwater runoff. Increased runoff is usually collected and channelized into ditches, drainage ways, road gutter and storm sewers designed to quickly move water away from developed areas. Without stormwater retention

and treatment, increased downstream flooding, erosion and sedimentation, increased pollution, and extended and elevated water levels in lakes and wetlands that limits growth of desirable aquatic plants can result.

Stormwater runoff carries with it fine sediment and pollutants from paved surfaces and lawns, such as nitrogen, phosphorus, bacteria, oil, pesticides, metals and sands or salts used on roads. When stormwater drains off a construction site, it carries sediment, phosphorus and other pollutants that harm lakes, streams and wetlands. The U.S. Environmental Protection Agency estimates that 20 to 150 tons of soil per acre is lost every year to stormwater runoff from construction sites.

Lakes

In many residential areas of lakes in the County, the shore and bluff impact zones have impervious surface connections from buildings, driveways, patios and roof gutters to the lake. Without infiltration or filtration of runoff, fine sediment, nutrients and other pollutants are transported to the lake. Shoreland vegetation protects the lake from the effects of polluted runoff, stabilizes the soil along the lake's edge, and provides habitat, shelter, food, and cooling shade for fish. Natural vegetation along many developed shoreland areas in the County has been converted to impervious surfaces and mowed lawns resulting in less filtration and infiltration of stormwater and loss of critical near-shore and aquatic habitat. In lake watersheds managing stormwater runoff to reduce phosphorus is needed in addition to managing runoff rate and volume to reduce erosion and sedimentation.

Rivers

History has shown that ravines and river corridors are prone to near channel erosion and landslides. Altered hydrology due to drainage and impervious surfaces has worsened these problems in some cases. Developed areas and infrastructure at both the top of and base of ravines and steep slopes can be affected by flooding, slope failure and other forms of mass wasting. Near channel erosion and landslides are addressed in a later section of this chapter.

Wetlands

Wetlands provide water storage functions that are important in managing stormwater. Water that is delayed or stored in wetlands reduces the amount of runoff down slope, thereby ensuring a decrease in flood crests. When runoff is detained in a regionally dispersed manner by wetland basins and water that eventually enters downstream areas in most cases are staggered (desynchronized). This broadens the storm hydrograph and reduces streamflow peaks. Land use activities can affect erosion up slope and sediment import into wetlands from stormwater runoff. An increased sediment load will decrease the wetland's capacity to store water, sometimes nearly eliminating storage capacity, and impacts wetland habitat functions. Encroachment on wetlands during and after development is an ongoing problem in the County. Buffers and buffer ordinances are needed to protect wetlands in developed areas to ensure wetlands continue to provide important water storage functions.

Responsibility for Stormwater Management

Local government units are responsible for regulating stormwater management to protect water quality and prevent flooding and damage to infrastructure from stormwater. Through regulation of stormwater, erosion and sedimentation, adverse effects to water resources can be minimized. Subdivision, zoning and shoreland ordinances and local permitting are examples of regulations to manage stormwater.

The Blue Earth County Water Management Plan defines a need and interest among jurisdictions in the County to coordinate and update ordinance requirements to provide coordinated management and regulations of stormwater throughout the County. These ordinances include those that manage the rate and volume of

stormwater discharge, channel protection sizing, accounting for all drainage in the watershed where development is proposed, nutrient reduction in lake watersheds and other management and maintenance needs to address bluff protection.

In unincorporated areas of the County, most stormwater ponds and retention basins in subdivisions are on private property. Long term functionality of these basins is problematic as there may be little to no maintenance or oversight to ensure the ponds function as designed. Common problems are ponds and basins filling with sediment due to lack of maintenance, encroachment on wetlands and stormwater retention sites with structures, or removal of vegetation.

Property owners share some responsibility for stormwater management, as site planning, grading, filling, drainage and vegetation management are largely done independently of any local or state regulations in unincorporated areas of the County.

Minnesota Rules

Minnesota Rules require an MPCA National Pollutant Discharge Elimination System (NPDES) General Construction Permit to regulate construction stormwater runoff when one acre or more of land is disturbed. These rules are in effect statewide. A Stormwater Pollution Prevent Plan (SWPPP) is required as part of the NPDES permit.

Development that disturbs less than one acre is exempt from MPCA NPDES Construction General Permit requirements. There are many sites in the County that do not meet this threshold but where development is occurring in sensitive areas and priority areas of the County where bare soil or new site grading will increase stormwater runoff.

Permanent stormwater management following the construction phase is not regulated by Minnesota Rules. Even in cases where permanent stormwater management is required for the NPDES permit, oversight and maintenance of the permanent stormwater system is not regulated by Minnesota Rules as NPDES permit coverage is terminated when the project is completed.

Regulated Urbanized Areas - Municipal Separate Storm Sewer System

In 2016, the MPCA added the City of Eagle Lake, City of Skyline, Mankato Township, South Bend Township, Minnesota State University Mankato and MNDOT Region 7 to the Mankato Municipal Separate Storm Sewer System (MS4). Additional ordinances and permits are required for land development in the MS4, as the MPCA rules require MS4 jurisdictions to administer ordinances for construction site runoff, illicit discharge detection and elimination, and post-construction stormwater management.

A MS4 is a conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, etc.) that is also owned or operated by a public entity (which can include cities, townships, counties, highway departments, universities, etc.) having jurisdiction over disposal of sewage, industrial waste, stormwater, or other wastes; designed or used for collecting or conveying stormwater; and which is not part of a publicly owned wastewater treatment works.

A Mankato Area Regional MS4 Stormwater Management Association was formed in 2016 to meet the requirements and goals of the NPDES MS4 Permit. The association will be contracting some of the work from the City of Mankato who has implemented an MS4 program for many years.

Hazardous Materials Release

The Blue Earth County Hazard Mitigation Plan definition of hazardous material is "any substance or material in a quantity or form which may be harmful to humans, animals, crops, water systems, or other elements of the environment if accidentally released. Hazardous materials include: explosives, gases (compressed, liquefied, or dissolved), flammable and combustible liquids, flammable solids or substances, oxidizing substances, poisonous and infectious substances, radioactive materials, and corrosives."

The entire County is at risk from hazardous material release. However, the degree of risk varies upon location. Properties adjacent to highways, railroads, and fixed-site facilities and pipelines are at the greatest risk. Potential surface and groundwater contamination is a risk nearly everywhere. Sites in the County with MPCA Hazardous Waste Generator licenses are located mainly in municipalities and unincorporated communities, like Judson and Beauford, as well as along highway corridors and railways. Many sites in the County associated with businesses or home occupations store or use hazardous materials without MPCA permits.

In the event of a hazardous material release, emergency response teams evacuate an area surrounding the site. The hazard extent (or evacuation area) can vary drastically depending on the type of material(s) released, the amount released, the wind direction/speed, and the location of the release. The County's emergency response teams use a half mile radius as a starting point for evaluating evacuation needs.

The Blue Earth County Hazard Mitigation Plan lists previously known occurrences of hazardous materials release which include materials that affect air and/or water, including anhydrous ammonia, gasoline and other petroleum products, as wells as other combustible and flammable liquids, corrosive materials, organic peroxide, and poisonous material. Remediation has been required on dozens of sites in the County.

Flooding

Flooding includes riverine floods, flash floods, local drainage floods, high groundwater floods and fluctuating lake level floods. Flooding in Blue Earth County is a concern related for public safety, loss of property and infrastructure, and water quality.

Every municipality and most townships in the County have been affected by flash floods or local drainage floods. According to the Minnesota All Hazard Mitigation Plan, flash flooding occurs somewhere in the state three times a year on average. Even where urbanization has not occurred, natural drainage systems' ability to accommodate severe storms without damage is apparent. Streams change course, banks and bluffs erode, vegetation and permeability change with seasons and wetlands and water bodies are affected by sedimentation.

Fluctuating lake water level floods in area lakes is typically short-term but can persist for months. The MNDNR has recently recorded the highest known elevations for some lakes in the County since the 1960s. The range of lake elevation records between the 1960s and 2017 shows a 3.5- to 4-foot range in elevation. Water levels on Madison Lake have been recorded since 1939. The lowest recorded elevation of Madison Lake was 1,003 feet in 1939, and the highest elevation was 1018.98 feet in 2016, a 15.98-foot difference.

To ensure property owners and residents of the County have access to federally subsidized National Flood Insurance Program (NFIP), Blue Earth County and four municipalities in the County administer floodplain ordinances that meet state and Federal Emergency Management Agency (FEMA) requirements. FEMA maps special flood hazard areas in a FEMA Flood Insurance Rate Map. This map is used to regulate development in FEMA flood hazard areas. FEMA is in the process of updating flood insurance rate maps using 2005 elevation data.

The preliminary digital flood insurance rate maps have been available in the County since 2011. FEMA estimates the effective date for the new maps will be in 2019.

There are limitations with using FEMA flood insurance rate maps as changes occur to the river channels over time. For example, the FEMA updated maps used 2005 elevation data, while elevation data collected in 2012 shows there have been significant river channel changes throughout the County. There are areas in the County where rivers and streams have migrated outside of areas that are mapped as special flood hazard areas shown on the FEMA 2011 preliminary flood insurance rate maps.

The FEMA floodplain maps do not show all flood prone areas. There are many small streams in the County which do not have areas mapped as special flood hazard areas. These areas do experience floods and flash floods. Examples of these streams in the County are Indian Creek, Perch Creek, Minneopa Creek, Morgan Creek, Rice Creek, Providence Creek, Willow Creek, and sections of the Little Cottonwood River and the Little Cobb River as well as unnamed and intermittent streams and ravines.

Risk of flooding in the County does not stop at the edge of the FEMA mapped high-risk floodplain. To ensure community resilience to flooding, land uses should be managed with policies that prevent flooding through stormwater management and water storage in all areas and limiting development or filling in areas with potential for flooding or fluctuating lake levels.

Flooding is addressed in both the Blue Earth County All Hazard Mitigation Plan and the Blue Earth County Water Management Plan and is included in Appendix H.

Ravine and Near Channel Erosion

Near channel erosion includes eroding stream banks, bluffs and ravines along river channels. Near channel erosion is occurring along every river in the County. Stream channel migration and bluff erosion are natural processes in river systems. Due to its glacial history, Blue Earth County is in area predisposed to near channel erosion and landslides.

Near channel erosion and landslides are potential hazards addressed in the Blue Earth County All Hazard Mitigation Plan. Near channel erosion also contributes significantly to water quality impairments and is addressed in the Blue Earth County Water Management Plan. Sections of both plans are included in Appendix L.

Erosion Hazard Area

"Erosion hazard area means, based on erosion rate information and other historic data available, an area of erosion or avulsion is likely to result in damage or loss of property or infrastructure within a 60-year period."

Source: 1999 FEMA Riverine Erosion Hazard Mapping Feasibility Study, erosion hazard area is defined by Section 577 of National Flood Insurance Reform Act (NIFRA)

Wooded and scenic areas near river channels and ravines in the County are attractive for residential development. These same areas are often vulnerable to near channel erosion, and in some cases runoff from development causes or worsens near channel erosion and landslides. Dwellings, structures and infrastructure, often constructed many decades ago, are threatened by near channel erosion in all watersheds in the County.

River bluffs can be impressive features: the largest in the County have nearly vertical faces up to 230 feet high and 1,640 feet long, and they line about 50 percent of the lower parts of the Blue Earth, Le Sueur and Watonwan River valleys. There are an estimated 900 eroding bluffs in the County.

Ravines are steep, deep, incised gullies at the tips of a drainage channel network. Ravines connect the uplands to the river valleys and are formed by ephemeral or intermittent streams that have flowing water for brief periods during the wet season or in response to rainfall. Ravines in the County display a diverse array of sizes and relief.

A significant factor in ravine erosion is the presence or absence of subsurface tile drain or stormwater outlets at the head of a ravine. Altered hydrology in the ravine watershed can also contribute to ravine erosion. Altered hydrology in a ravine catchment can be the result of grading and filling or new impervious surfaces changing the rate or volume of drainage to the ravine, decreased water storage and increased subsurface tile drainage. The area drained with subsurface tile is often greater than the surface drainage area draining to the ravine.

Blue Earth County identified more than 300 ravines with more than five feet of erosion when comparing differences between 2012 and 2005 LiDAR data.

Due to the episodic nature of climatic events that initiate many instances of near channel erosion, reliable models or other methods to *predict* rates of near channel erosion presently do not exist. This is particularly true in Blue Earth County where multiple forms of near channel erosion are taking place, and the processes, interaction and extent of each is not fully understood at this time. Near channel erosion, especially landslides, often occurs many years following land use changes, vegetation changes and major storms due to the complex interaction of soil saturation and impacts to root structure, mass and decay.

Landslides and Mass Wasting

Blue Earth County is in one of the few areas of Minnesota where the United States Geological Survey (USGS) has mapped with greater than a low susceptibility of landslides. Compared to most other parts of the Minnesota where there is "low incidence" of landslides, Blue Earth County has a "moderate susceptibility" to landslides in the Blue Earth, Le Sueur and Minnesota River watersheds. The 1982 digital compilation of the *USGS Landslide Incidence and Susceptibility Map for the United States* shows the areas of moderate landslide susceptibility. Susceptibility to land sliding was defined as the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes or to anomalously high precipitation.

Mass Wasting

"Erosion associated with mass wasting processes is extremely difficult to predict due to the episodic nature of climatic events that initiate movement. Often landslides occur many years following vegetation and land use changes due to complex interactions of root mass decay and soil saturation from major storms."

Source: EPA, Hillslope Processes: Mass Wasting

The USGS definition of landslides includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors:

- erosion by rivers create over-steepened slopes
- rock and soil slopes are weakened through saturation by snowmelt or heavy rains

- excess weight from accumulation of rain or snow, or from manmade structures may stress weak slopes to failure

According to the USGS the following areas are generally prone to landslide hazards:

- On existing old landslides
- On or at the base of slopes
- In or at the base of minor drainage hollows
- At the base or top of an old fill slope
- At the base or top of a steep cut slope
- Developed hillsides where leach field septic systems are used

Many USGS landslide indicators have been observed near river channels and bluffs in the County. For example, new sites of groundwater sapping or seeps are observed or are changing, and large, newly formed cracks in the ground within feet of the top of bluffs and the edge of ravines and leaning trees and retaining walls. Areas downslope of septic systems and footing drain tiles near channels and ravines also appear to increase sapping in some locations.

Erosion Hazard Vulnerability Assessment

The Blue Earth County All Hazard Mitigation Plan Update in 2013 assessed vulnerability of critical facilities and buildings to riverine erosion hazards. The assessment did not include ravines or steep slopes. The following is a vulnerability assessment summary from the hazard mitigation plan:

- 338 miles of rivers and streams with stream banks
- More than 900 eroding bluffs
- More than 295 eroding ravines
- 186 miles of roadway within 33 feet of bluffs
- 89 structures within 30 feet of bluffs
- 267 structures within 50 feet of bluffs (includes 89 structures within 30 feet)
- 4 municipal wastewater treatment facilities in erosion or flood hazard areas
- 2 municipal wells in hazard area

In the eight years from 2010 to 2017, there were disaster declarations in 2010, 2011, 2014 and 2016. Owners of five dwellings were eligible for structural acquisition grants from the FEMA funded MNDNR Flood Damage Reduction grant program. Other affected property owners in the County have moved driveways away from ravines and river bluffs and have otherwise experienced damage. Several townships in the County have relocated portions of roadways or stabilized erosion hazards affecting roads or infrastructure. For example, the stream bank on Ivy Road in Rapidan Township was restored and stabilized to reconnect the bridge to the eroded streambank and roadway (see Figure 17). Figure 16 shows the Ivy Lane Bridge on Maple River, following September 2010 flood, looking north (downstream)

Figure 16: Ivy Lane Bridge on Maple River Following September 2010 Flood

Figure 17: Stream bank on Ivy Road on Maple River Restored after September 2010 Flood

Tornados

Tornados are a potential natural hazard everywhere in the County. The Blue Earth County All Hazard Mitigation Plan Update 2013 mitigation actions include construction of safe rooms for manufactured home parks. As described in the plan "Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events."

Dams

There are eleven publicly owned dams in the County. Ten of the dams are outlet structures on lakes and wetlands.

The Rapidan Dam located on the Blue Earth River approximately 12 miles upstream of Mankato is the only dam in the County that generates electricity. Figure 18 shows the Rapidan Dam and County Road 9 Bridge on the Blue Earth River. The Rapidan Dam which was constructed between 1908 and 1910, supports hydroelectric power generation, but also blocks fish passage between the Minnesota River and the 1,200 miles of perennial tributary streams above the dam.

The dam served as an electric power generating facility for Northern States Power Company until it was damaged by flooding in 1965. Blue Earth County obtained ownership of the structure in 1970. Under an agreement with the County, Rapidan Redevelopment, Ltd. redeveloped the dam for producing hydroelectric power in 1984. In 2002, extensive undermining of the dam's foundation was discovered, and emergency repairs were required to prevent a dam failure. Additional apron, foundation and abutment repairs have been conducted since 2002. Ontario Power Generation currently operates the hydroelectric generation equipment at the dam under a lease agreement with Blue Earth County.

The Federal Energy Regulatory Commission (FERC) has classified the dam as having a significant downstream hazard potential based on the environmental damage that would be caused by an uncontrolled release of the agriculturally impacted sediments behind the dam.

An Emergency Action Plan is designed to ensure an early warning and provide emergency coordination to the downstream establishments and downstream property owners if there should be an impending flood or actual sudden release of water caused by the failure of the Rapidan Hydroelectric Project. Procedures for the emergency response are accommodated through flowcharts which include both Yellow Alert and Red Alert Notifications. During an emergency, callers would have to convey and understand the different conditions;

- **High Flow Operations** is a yellow alert event which occurs when river flows reach 10,000 cfs (cubic feet per second). An evacuation and closure of public access and County Campground is initiated.

- **Non-Failure Emergency Condition** includes natural flood events that are expected to result in high flow conditions and downstream flooding, but do not pose a threat to the integrity of the dam. This is a yellow alert event which occurs when river flows reach 15,000 cfs. Evacuation and closure of the campground is completed to ensure safety.

- **Potentially Hazardous Situation Developing** is also a yellow alert event which if not controlled, could cause failure of the dam resulting in rapid depletion of the reservoir and or uncontrolled downstream flooding, creating a potential hazard to public health and welfare. Evacuation and closure of the campground are required for public safety.

- **Failure is Imminent or Has Occurred** results in rapid depletion of the reservoir and or uncontrolled downstream flooding creating a hazard to public health and welfare and/or structures. This condition indicates that dangerous high-speed, high volume flood waters are likely to occur in the river and flood-prone areas below the dam. This is a red alert event which requires immediate evacuation and closure of the Rapidan Dam County Park and Campground.

Additionally, Ontario Power Generation performs an annual assessment by comparing the Flood Inundation Maps to a list of construction permits that were issued by the County within the year to ensure that none of them are within the Rapidan Dam Inundation Zones.

Figure 18: Rapidan Dam and County Road 9 bridge on Blue Earth River.

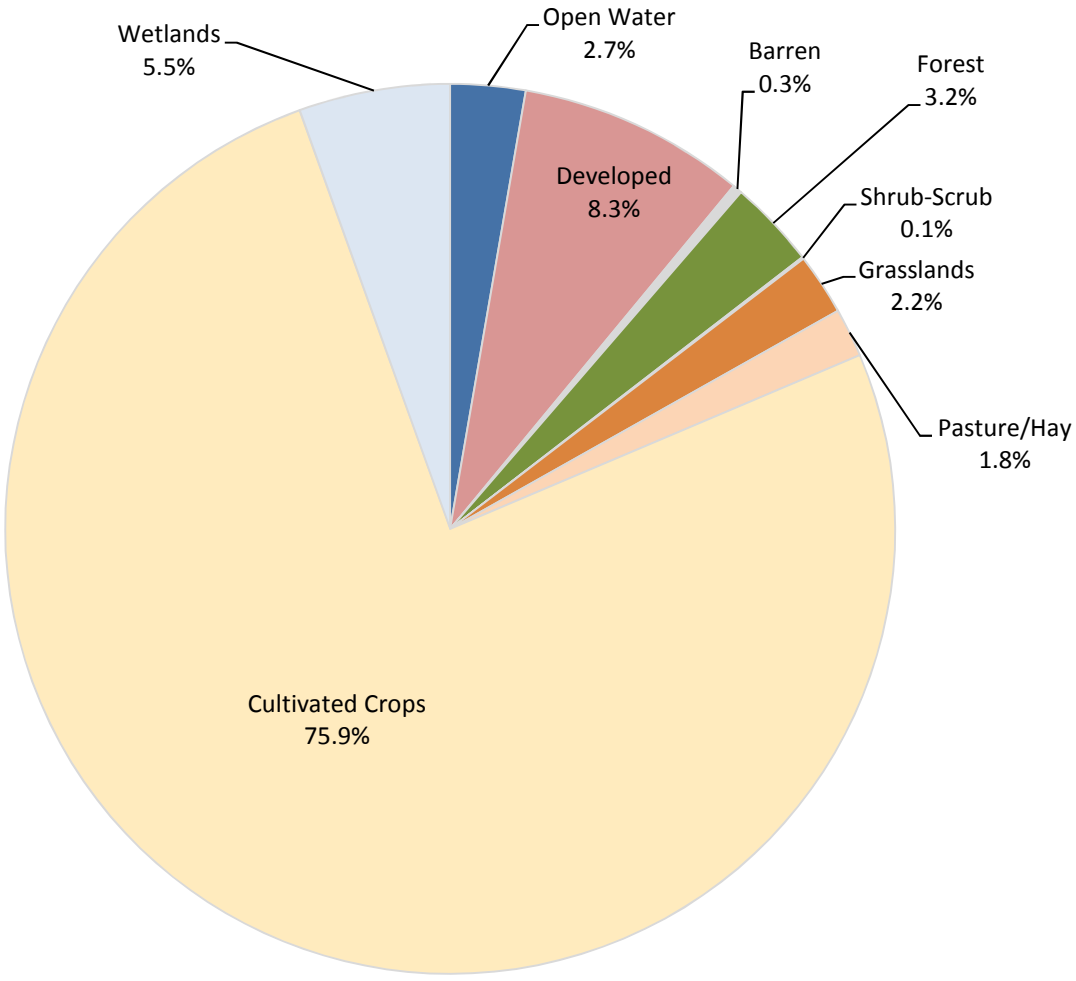
Chapter 6 - Land Use

Land Cover

Blue Earth County's landscape is dominated by agricultural land uses. Figure 20 displays the land cover data from the most recently available 2011 National Land Cover Database which classifies land cover from the 2011 Landsat satellite data. Over 75 percent of the County was classified as cultivated crops in 2011. High, medium and low density developed land represented 8.3 percent of land in 2011. Land classified as wetlands were 5.5 percent and open water was 2.7 percent of land in the County. Forests, mostly along the steep slopes adjacent to the rivers, represented just over 3 percent of the County. Areas shown as barren land are mostly quarries or gravel pits and they represented less than 1 percent of land in the County.

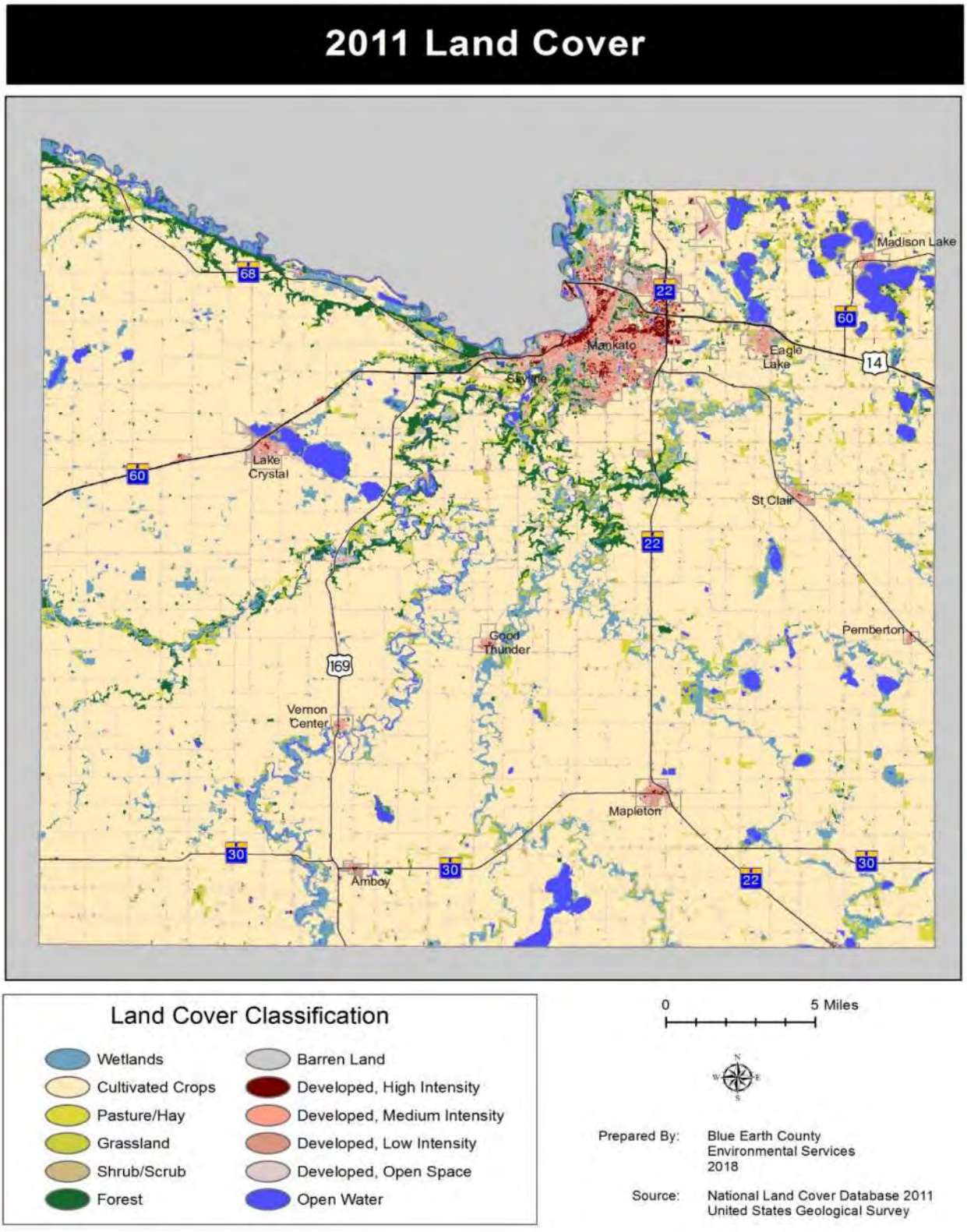
Figure 19 displays the percentage of each type of land cover classification and Figure 20 shows a map of the 2011 Land Cover for Blue Earth County.

Figure 19: 2011 Blue Earth County Land Use Classifications from 2011 National Land Cover Database



Source: Blue Earth County Environmental Services

Figure 20: 2011 Land Cover



Development Trends

The 1998 County Land Use Plan and the 1996 Zoning Ordinance were updated to protect agricultural land, protect environmentally sensitive lands, preserve the County's rural character and provide public services in a cost-effective manner.

Since 1996 County land use regulations only allow one house per quarter-quarter section in the conservation and agriculture zoning districts. Prior to 1996 there was not a density restriction in the Conservation District. Most of the subdivisions created along rivers, streams and ravines in the Conservation District were in Mankato Township, Jamestown Township, South Bend, LeRay Township and Decoria Township. New non-farm development has continued in these townships, mostly near lakes, rivers, streams, ravines and wetlands. The map in Figure 21 shows residential housing built Countywide between 2000 and 2017 by quarter-quarter section (40-acres).

Rural residential development in the County has slowed since 2010 compared to the time periods of 1990 to 2000 and 2000 to 2010. The number of houses built by township from 1990 to 2017 is displayed in Table 11. Mankato Township had the most houses built in that time, with a total of 210 houses. Decoria Township has also seen a significant number of houses built in subdivisions overlooking the Cobb River and Le Sueur River. Since 1990, Jamestown Township and LeRay Township in the northeast part of the County have also seen significant growth. Many of these dwellings have been built in subdivisions around Madison Lake and Lake Ballantyne. The subdivisions on those lakes are now served by the Tri-Lakes sewer district or were annexed to the City of Madison Lake.

As part of a regional center, there has been a great deal of residential, commercial, and industrial growth in the City of Mankato since 2000. From 2000 to 2010, Mankato's population grew by 6,878 which is just over 2.1 percent annual growth. Mankato's population is estimated to continue growing but at a slightly slower rate of just under 1 percent according to the State Demographic Data Center's estimates in 2016. The residential growth from 2000 to 2010 expanded the city limits to the northeast, east and southeast. More recently there has been significant in-fill residential and other development in Mankato. Growth of Mankato is managed with orderly annexation agreements between the City and the three surrounding townships, including Mankato, South Bend and Lime. Mankato has also annexed some subdivisions adjacent to the city in Mankato Township and Lime Township as part of the annexation agreements.

Growth in the Cities of Eagle Lake, Good Thunder, Lake Crystal, Madison Lake, St. Clair and Pemberton has been primarily residential development. Eagle Lake and Madison Lake were the fastest growing cities in the County from 2000 to 2010. Since 2010, the City of Eagle Lake was the fifth, fastest-growing city in Minnesota according to the Minnesota Demographic Data Center population estimates from 2015. Eagle Lake has expanded mainly south and west toward Mankato. Residential development in the City of Madison Lake expanded southwest and north. Madison Lake has also grown with the annexation of subdivisions mainly in the shoreland areas around Duck Lake, Lake Ballantyne and Madison Lake. Growth in Lake Crystal has occurred to the north across Minnesota Highway 60 and west near the new school and recreation center.

Figure 21: Housing Units Built Between 2000 and 2017.

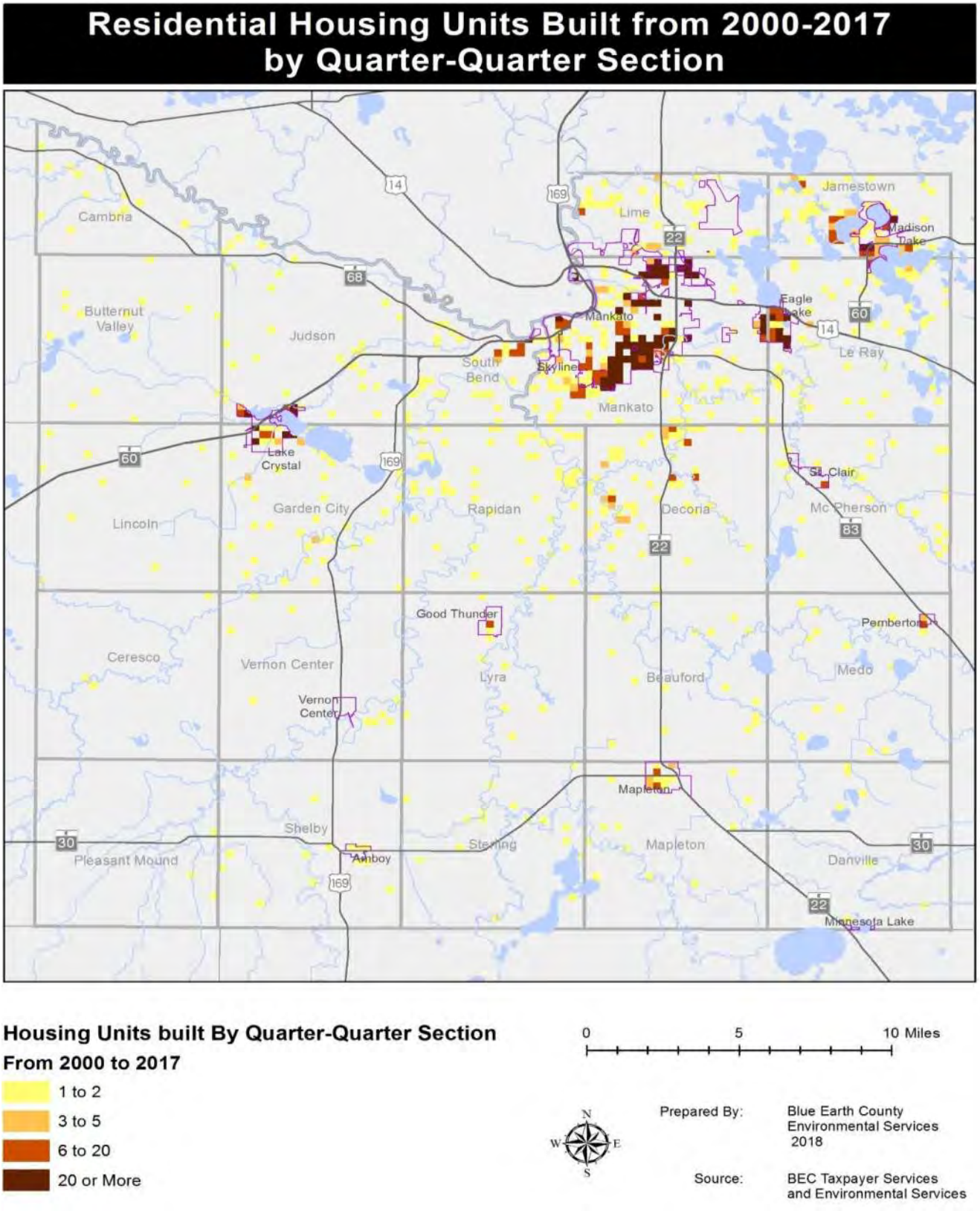


Table 11: Houses Built by Township since 1990

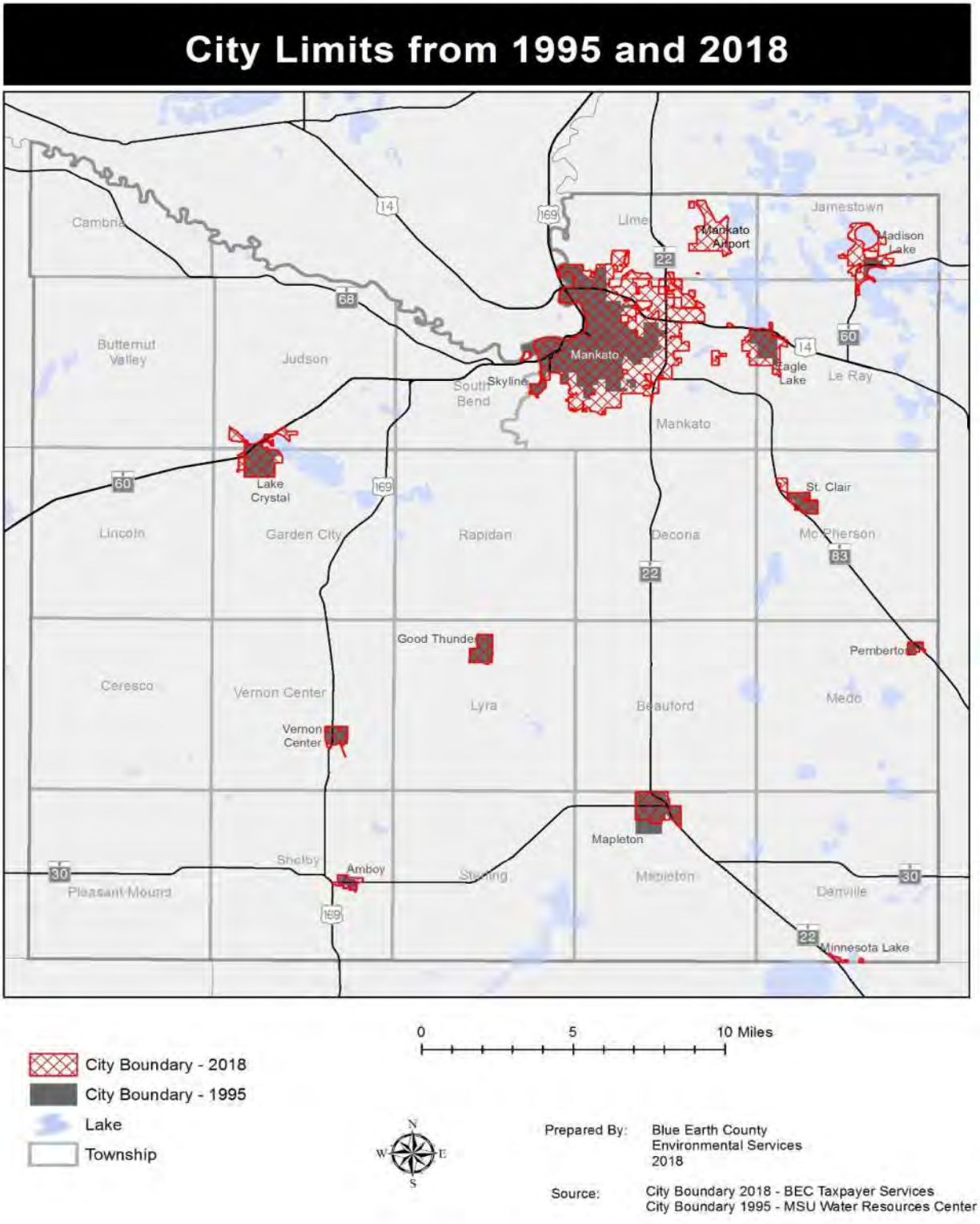
Township	Number of Houses Built			
	1990 to 1999	2000 to 2009	2010 to 2017	Total
Mankato	115	69	26	210
Decoria	64	95	30	189
Jamestown	55	71	26	152
Lime	70	47	19	136
South Bend	50	60	15	125
Le Ray	53	42	28	123
Rapidan	43	46	20	109
Garden City	35	45	14	94
McPherson	22	23	7	52
Judson	15	26	5	46
Cambria	19	9	4	32
Sterling	11	16	0	27
Beauford	8	13	5	26
Butternut Valley	8	12	3	23
Medo	8	10	4	22
Shelby	11	8	1	20
Lyra	10	7	2	19
Danville	10	4	4	18
Mapleton	4	9	3	16
Vernon Center	6	5	5	16
Lincoln	4	5	4	13
Ceresco	8	2	1	11
Pleasant Mound	2	2	1	5
Total	**631**	**626**	**227**	**1,484**

Source: Blue Earth County Taxpayer Services and Environmental Services

Annexations and City Limits

The map in Figure 22 shows changes in the jurisdictional boundaries of municipalities between 1995 and 2018. Mankato has expanded with annexation east, south and north and includes the airport northeast of the city. Madison Lake's boundary has grown significantly to the north and west with annexation of all developed properties surrounding Duck Lake and a portion of the east side of Lake Ballantyne. The Eagle Lake city limits expanded most significantly to the west towards Mankato. Lake Crystal has expanded west to the area where a new school was built and north to Lily Lake and along Minnesota Highway 60.

Figure 22: City Limits Map, 2018



Orderly Growth and Development

Urban Fringe Overlay District

An Urban Fringe Overlay District (UFD) was first established in the County Zoning Ordinance in 1998 along with development of County Road 90 (the south route). The County Board of Commissioners initiated the Urban Fringe Overlay District to limit leap-frog development and billboards and protect the purpose of the South Route to be a southern beltway around the City of Mankato. In anticipation of a potential four-lane road and to maximize public safety, the County purchased access to County Road 90 from adjacent land owners and additional right-of-way for a wider roadway in the future. In 2007 and 2008 the UFD was expanded to areas around the City of Madison Lake and the City of Eagle Lake respectively. A map of the Urban Fringe Overlay District is displayed in Figure 23 on the previous page.

As stated in the County Zoning Ordinance, the purpose of the Urban Fringe Overlay District is:

> "to prevent encroachment of nonfarm uses into agricultural lands, and to allow for the orderly conversion of agricultural lands to urban type uses which are serviced by municipal water and sewer systems. Some of the nonfarm land uses within the underlying districts are not compatible with, and/or may interfere with, the orderly development of the area for future urban uses if allowed to develop without the limitations imposed by this UFD urban fringe overlay district. Limiting the intensity of development within the UFD urban fringe overlay district ensures that development occurs in a fiscally and environmentally responsible manner consistent with future development plans for the area."

Orderly Annexation Agreements

To manage orderly growth of the City of Mankato, the City has negotiated Orderly Annexation Agreements with surrounding townships, including Mankato Township, Lime Township and South Bend Township.

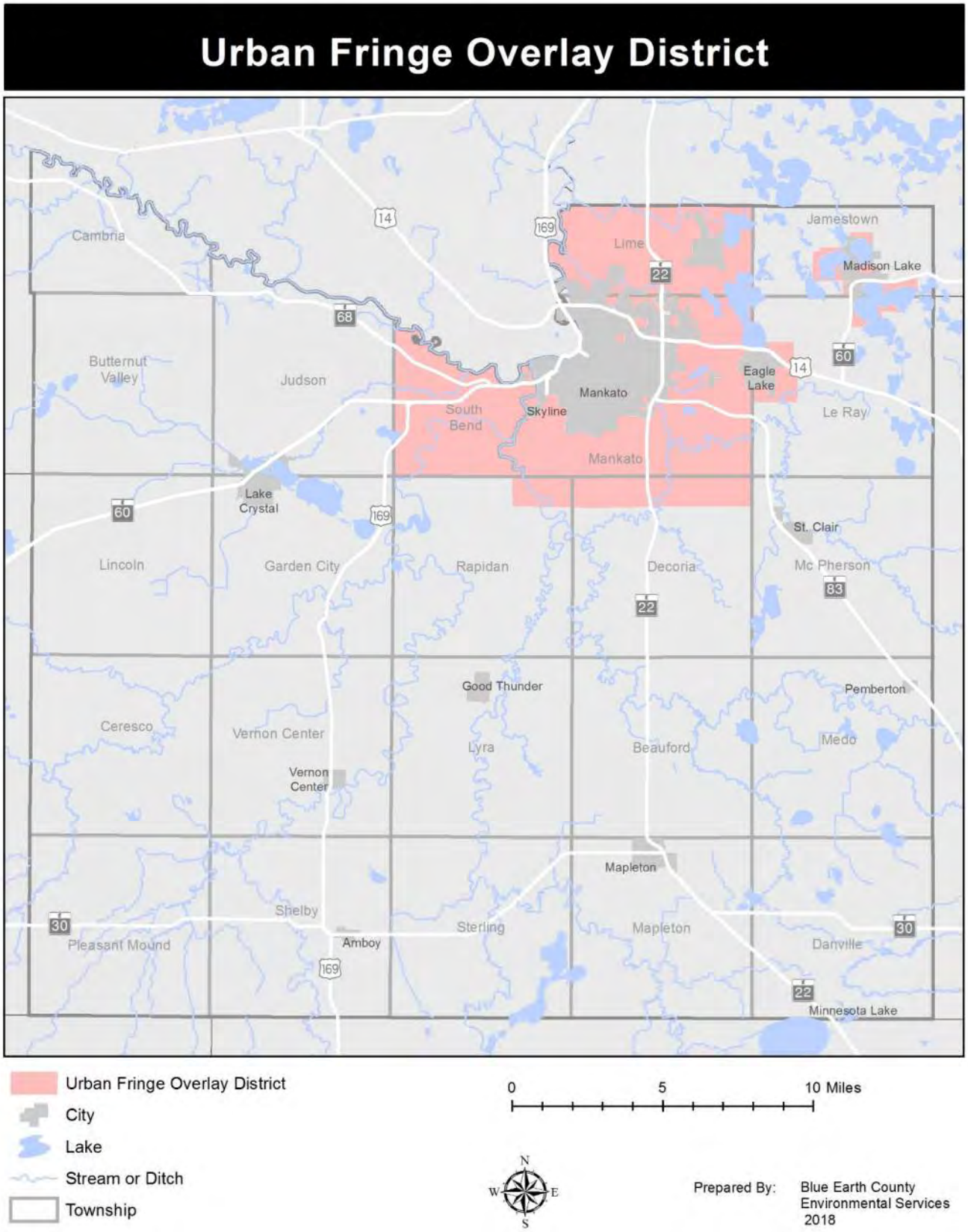
Land Use Authority and Official Controls

Blue Earth County administers many ordinances related to land use and development. The jurisdiction of Blue Earth County ordinances varies depending on purpose and whether municipalities or townships have jurisdiction or have elected jurisdiction.

The County's zoning ordinance jurisdiction applies to most unincorporated areas of the County. The County's shoreland ordinance and floodplain ordinance jurisdiction applies to all unincorporated areas in the County. Mankato Township and Lime Township have zoning ordinances but do not have shoreland and floodplain ordinances. Pleasant Mound Township has a zoning ordinance that regulates some types of land uses, and the County also administers zoning regulations in the township.

The City of Mankato has orderly annexation agreements with Mankato Township, Lime Township and South Bend Township. The County zoning ordinance contains provisions for townships with orderly annexation agreements. The County zoning ordinance also addresses orderly development in the urban fringe of the cities of Mankato and Eagle Lake and Madison Lake with urban fringe overlay districts. The Mankato-North Mankato Planning Organization (MAPO) planning area and urbanized boundary are in the County Zoning Ordinance's urban fringe overlay district.

Figure 23: Urban Fringe Overlay Districts Map, 2018



Some of the County's official controls, like those ordinances related to water supply wells and septic systems, have jurisdiction in all areas of the County. The County has delegation agreements with State agencies to administer Minnesota Rules for feedlots and water supply wells and is responsible for permitting and inspections for those programs. The County also administers Minnesota Rules for septic systems and wetlands. The City of Mankato also administers Minnesota wetland rules.

The County has jurisdiction for Minnesota's buffer law enforcement, but the Blue Earth County Soil and Water Conservation District (SWCD) determines compliance with the law. The County shoreland ordinance also contains provisions for native vegetation in the shoreland areas of public waters.

The County highway access management ordinance regulates access to County state aid highway and County road systems that are located within and outside of the corporate limits of municipalities.

The Mankato Regional Airport Zoning Ordinance is administered by jurisdictions with zoning authority in portions of Blue Earth County, Le Sueur County and Nicollet County. In Blue Earth County portions of the townships of Lime, Mankato, Le Ray, McPherson, Jamestown and Decoria are affected by airport zoning ordinance, with land in Lime Township most affected.

These and other regulations and plans interact to support the County vision. Ordinances and regulations administered by the County are summarized below.

Land Use (Zoning) Ordinance

Blue Earth County administers the Land Use Ordinance in all unincorporated areas of the County, except for Mankato Township and Lime Township. The purpose of the zoning ordinance is:

1) **To promote and protect the health, safety and general welfare.** To prevent the overcrowding of the land and undue congestion of population, by providing adequate light, air and convenience of access to property, by regulating the use of land, buildings and the bulk of structures in relationship to surrounding properties.
2) **To provide for the orderly development of the County.** To protect and conserve the character and the social and economic stability of agricultural, residential, commercial, industrial and other use areas in the County and promote their orderly development.
3) **To ensure the appropriate use of land.** To secure the most appropriate use of land within the County.
4) **To ensure adequate utilities and transportation.** To facilitate adequate and economical provision of transportation, water supply and sewage disposal.
5) **To ensure adequate public facilities.** To provide for general location of schools, recreation facilities and other public requirements.
6) **To ensure the conservation of natural resources.** To provide policy and regulations to conserve the natural resources of the County.
7) **To prevent pollution.** To provide policy and regulations to minimize the potential for environmental pollution.

The purpose of the Zoning Ordinance is to promote the health, safety and general welfare of the unincorporated areas of the County by:

1) Regulating the use of land and building for trade, commerce, industry, residence and other purposes;
2) Regulating water supply and sewage disposal facilities;
3) Ensuring that new development does not increase the runoff rate or degrade water quality leaving the property;
4) Establishing standards for the height and size of buildings, the size of yards, courts and other open spaces and the density of populations;
5) Creating districts for such purposes and establishing the boundaries thereof; by providing for changes in regulations, restrictions and boundaries of such districts; by defining certain terms used in this chapter; and
6) Providing for enforcement and administration, imposing penalties for the violation of this chapter.

Land Division Ordinance

The purpose of the Land Division Ordinance is to:

1) Ensure that to the maximum extent possible, all lands will be developed with adequate protection provided for the health and safety of residents by requiring necessary services such as properly designed streets and adequate sewage and water service.
2) Ensure that effective protection is given to the natural resources of the community, especially groundwater and surface waters.
3) Encourage well-planned subdivisions through the establishment of adequate design standards.
4) Discourage inferior developments that might adversely affect the local tax base.
5) Place the cost of improvements against those benefitting from their construction.
6) Create neighborhoods which will be of lasting credit to the community.
7) Facilitate adequate provisions for transportation and other public facilities.
8) Secure the rights of the public with respect to public lands and waters.
9) Improve land records by the establishment of standards for surveys and plats.
10) Safeguard the interests of the public, the homeowner, the subdivider and local units of government.
11) Prevent, where possible, excessive governmental operating and maintenance costs.

Shoreland Ordinance

“Shoreland means land located within the following distances from public waters: 1,000 feet from the ordinary high-water level of a lake, pond, or flowage; and 300 feet from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater.” Blue Earth County administers the Shoreland Ordinance in all unincorporated areas of the County, including Lime Township and Mankato Township.

The Shoreland Ordinance Statement of Purpose:

> “The uncontrolled use of the shoreland of the County affects the public health, safety and general welfare, not only by contributing to pollution of public waters, but also by impairing the local tax base. Therefore, it is in the best interests of the public health, safety and welfare to provide for the wise subdivision, use and development of shorelands of public waters. The legislature of the state has delegated responsibility to local governments of the state to regulate the subdivisions, use and development of the shorelands of public waters and thus preserve and enhance the quality of surface waters, conserve the economic and natural environmental values

of shorelands, and provide for the wise use of waters and related land resources. This responsibility is hereby recognized by the County."

Shoreland Ordinances must be consistent with Minnesota Rules, Chapter 6120, and may be more restrictive. The Shoreland Ordinance contains provisions for subdivisions, bluff and shore impact zones, placement of buildings, impervious surfaces, and wastewater treatment. The MNDNR provides guidance for administering shoreland ordinances which can be used for consistent interpretation.

Administration of the Shoreland Ordinance recognizes "due consideration of the purposes, goals and objectives of the County land use plan and comprehensive water plan as adopted, approved and amended from time to time by the board of commissioners. The board of commissioners recognizes that the land use plan is a guide for the future development of the County and the basis for the enactment of this chapter."

Floodplain Ordinance

To ensure property owners and residents of the County have access to federally subsidized National Flood Insurance Program (NFIP), Blue Earth County and four municipalities in the County administer floodplain ordinances that meet state and Federal Emergency Management Agency (FEMA) requirements.

Blue Earth County administers the Floodplain Ordinance in all unincorporated areas of the County that are shown as special flood hazard areas on the FEMA Flood Insurance Rate Map. This map is used to regulate development in FEMA flood hazard areas. As described in the Community Resilience chapter of this plan, FEMA maps do not show all flood prone areas in the County.

The purpose of the Floodplain Ordinance is to "Minimize the potential loss of life, loss of property, health and safety hazards, disruption of commerce and government services, extraordinary public expenditures for flood protection and relief, and the impairment of the tax base."

FEMA is in the process of updating flood insurance rate maps using 2005 elevation data. The preliminary digital flood insurance rate maps have been available in the County since 2011. FEMA estimates the effective date for the new maps will be in 2019.

Subsurface Sewage Treatment

The purpose of the Individual Sewage Treatment Ordinance is to "provide minimum standards for and regulation of individual sewage treatment systems including the proper location, design and construction; their necessary modification and reconstruction; their operation, maintenance and repair to protect surface water and groundwater from contamination by human sewage and waterborne household and commercial wastes; to protect the public's health and safety, and eliminate or prevent the development of public health nuisances pursuant to the authority granted under Minn. Stats. Chs. 115 and 145A and Minn. Rules Ch. 7080, as amended, that may pertain to sewage and wastewater treatment."

Wetland Regulations

Blue Earth County administers the Minnesota Wetland Conservation Act. Blue Earth County has jurisdiction County-wide except within the City of Mankato. The MNDNR and USACE also have jurisdiction for some wetlands in all areas of the County.

Livestock Manure Management Ordinance

Blue Earth County administers a Livestock Manure Management Ordinance that applies to all animal feedlots with ten or more animal units and to all areas of the County outside the incorporated limits of municipalities.

The County also has a delegation agreement with the MPCA to issue feedlot permits and conduct feedlot inspections for feedlots with ten or more animal units in shoreland and 50 or more animal units in other areas of the County up to 1,000 animal units or 2,500 or more head of swine. Feedlots with more than 1,000 animal units or 2,500 head of swine are defined as large concentrated animal feeding operations which are also permitted by the MPCA.

The Livestock Manure Management Ordinance polices are as follows:

1. An adequate supply of healthy livestock, poultry and other animals is essential to the well-being of County citizens and the state. These domesticated animals provide our daily source of meat, milk, eggs and fiber. Their efficient, economic production must be the concern of all consumers if we are to have a continued abundance of high-quality, wholesome food and fiber at reasonable prices.
2. However, livestock, poultry and other animals produce manure which may, where improperly stored, transported or disposed, negatively affect the County's environment. When animal manure adds to air, surface water, groundwater or land pollution in the County, it must be controlled.
3. This article has been promulgated to provide protection against pollution caused by manure from domesticated animals.
4. The rules of this article recognize that animal manure provides beneficial qualities to the soil and to the production of agriculture crops.
5. This article complies with the policy and purpose of the state regarding the control of pollution as set forth in Minn. Stats. Chs. 115 and 116. Experience has shown that the environment, residential and agricultural uses of land can be incompatible. The purpose of this article is to regulate the management of manure, and the uses and development of land in the County which may adversely affect the health, safety and general welfare of the public.

Highway Access Management

The Highway Access Management Ordinance is administered by the County Engineer or his/her designees. The ordinance regulates road design, turn lanes, bypass lanes, and access permits that are required when there is a new access, when there is a new development proposal or change in land use using an existing access.

The ordinance states its purpose as: “The board of commissioners recognizes the need for regulation of entrances from adjoining lands to the traveled way of the County state aid highways and the County road systems under their supervision to promote the public safety, efficient flow of traffic, the aesthetic values, and engineering integrity of said road systems.”

Stormwater

Stormwater management is addressed in the Zoning, Subdivision, and Shoreland Ordinances. Stormwater management and construction stormwater are described in the Community Resilience Chapter of this plan and Appendix J.

Additional stormwater management ordinances have jurisdiction in the townships of South Bend and Mankato. Each of the Townships and the County have jurisdiction with stormwater facilities owned by their jurisdictions. Mankato Township issues land disturbance permits in the township, and Blue Earth County issues land disturbance permits in South Bend Township.

Buffer Ordinance

The Blue Earth County Shoreland Ordinance requires perennial vegetation in bluff and shore impact zones on public waters with shoreland classification in agricultural areas.

Minnesota Statute 103F.48, Riparian Protection and Water Quality Practices, known as the Minnesota Buffer Law, requires perennial vegetation of up to 50 feet along public water lakes, rivers and streams and 16.5 feet along ditches. The Blue Earth County Soil and Water Conservation District (SWCD) is responsible for working with landowners and determining compliance with the Buffer Law with guidance developed by the Minnesota Board of Water and Soil Resources. Blue Earth County accepted jurisdiction for enforcement of the law when the SWCD determines a parcel is out of compliance.

The purpose and intent of the Buffer Ordinance is to:

1. Provide for riparian vegetated buffers and water quality practices to achieve the following purposes:
    a. Protect state water resources from erosion and runoff pollution;
    b. Stabilize soils, shores and banks; and
    c. Protect or provide riparian corridors.

2. Coordinate the implementation and enforcement of the water resources riparian protection requirements of Minn. Stat. §103F.48 with the shoreland management rules and ordinances adopted under the authority of Minn. Stat. §103F.201 to 103F.227 and the management of public drainage systems established under Minn. Stat. §103E where applicable.

3. Establish procedures for enforcement of the Riparian Protection and Water Quality Practices law under the jurisdiction of the County as provided in Minn. Stat. §103F.48 subd. 7, and Minn. Stat. §103B.101, subd. 12a.

4. Provide efficient and effective direction to landowners and protection of surface water quality and related land resources.

Airport Zoning

The Mankato Regional Airport Zoning Ordinance was first adopted in 1975. The Mankato Joint Airport Zoning Board adopted an updated ordinance in 2006. It is the duty of the Blue Earth County and other affected jurisdictions to administer and enforce the regulations. Variances must be transmitted to the City of Mankato Zoning Administrator. In portions of Mankato Township, Lime Township, Jamestown Township and Le Ray Township in Zone C, residential development shall be limited to one dwelling per quarter (40 acres). No use of

land in the safety zone should cause interference with operations of radio or electronic facilities on the airport or between airport and aircraft. Other restrictions apply for air space obstruction a greater distance from the airport.

The Mankato Regional Airport Zoning Ordinance finds that:

1. The Mankato Regional Airport is deemed a beneficial essential public service that provides an important public need and serves a public good.

2. An airport hazard endangers the lives and property of users of Mankato Regional Airport, and property or occupants of land in its vicinity; and, if the obstructive type in effect reduces the size of the area available for the landing, takeoff, and maneuvering of aircraft, thus tending to destroy or impair the utility of said Airport and the public investment therein.

3. The creation or establishment of an airport hazard is a public nuisance and an injury to the region served by the Mankato Regional Airport.

4. For the protection of the public health, safety, order, convenience, prosperity, and general welfare, and for the promotion of the most appropriate use of land, it is necessary to prevent the creation of establishment of airport hazards.

5. The prevention of these airport hazards should be accomplished, to the extent legally possible, by the exercise of the police power without compensation.

6. The prevention of the creation or establishment of airport hazards, and the elimination, removal, alteration, mitigation, or marking and lighting of existing airport hazards are public purposes for which political subdivisions may raise and expend public funds.

7. This Ordinance hereby supersedes the Airport Zoning Ordinance adopted on July 21, 1975.

Land Use Overview

Natural Resources

Natural resources contribute to the high quality of life in the County. Natural resources in the County are mostly in environmentally sensitive areas, including lakes, rivers, streams, wetlands and the shorelands, steep slopes, floodplains, and wooded areas near these features, as well as areas with sensitive geology.

Future development should be considered in a manner that limits the impacts to existing natural resources systems and preserves their presence for future generations. Additionally, cumulative impacts to natural resources should be considered as additional development is considered. In addition to the Land Use Plan, Blue Earth County manages natural resources through other planning and regulatory efforts. Land development should be coordinated with natural resources plans and should be carried out in accordance with the policies and strategies of the important natural resource planning efforts completed and adopted separately.

Natural resources and priority areas in the Blue Earth County Greenprint are described in more detail in the Physical Characteristics and Natural Resources chapter of this plan and appendices.

Agriculture

Agriculture is vital to the local, regional and state economies, and is an integral part of the County's rural character. Land available for agricultural uses are limited by soils, slope and land use. In general, land in the County that is not farmed is either too steep, too wet or has been developed or converted from agricultural land for other uses. Most agricultural land is cultivated for crop production.

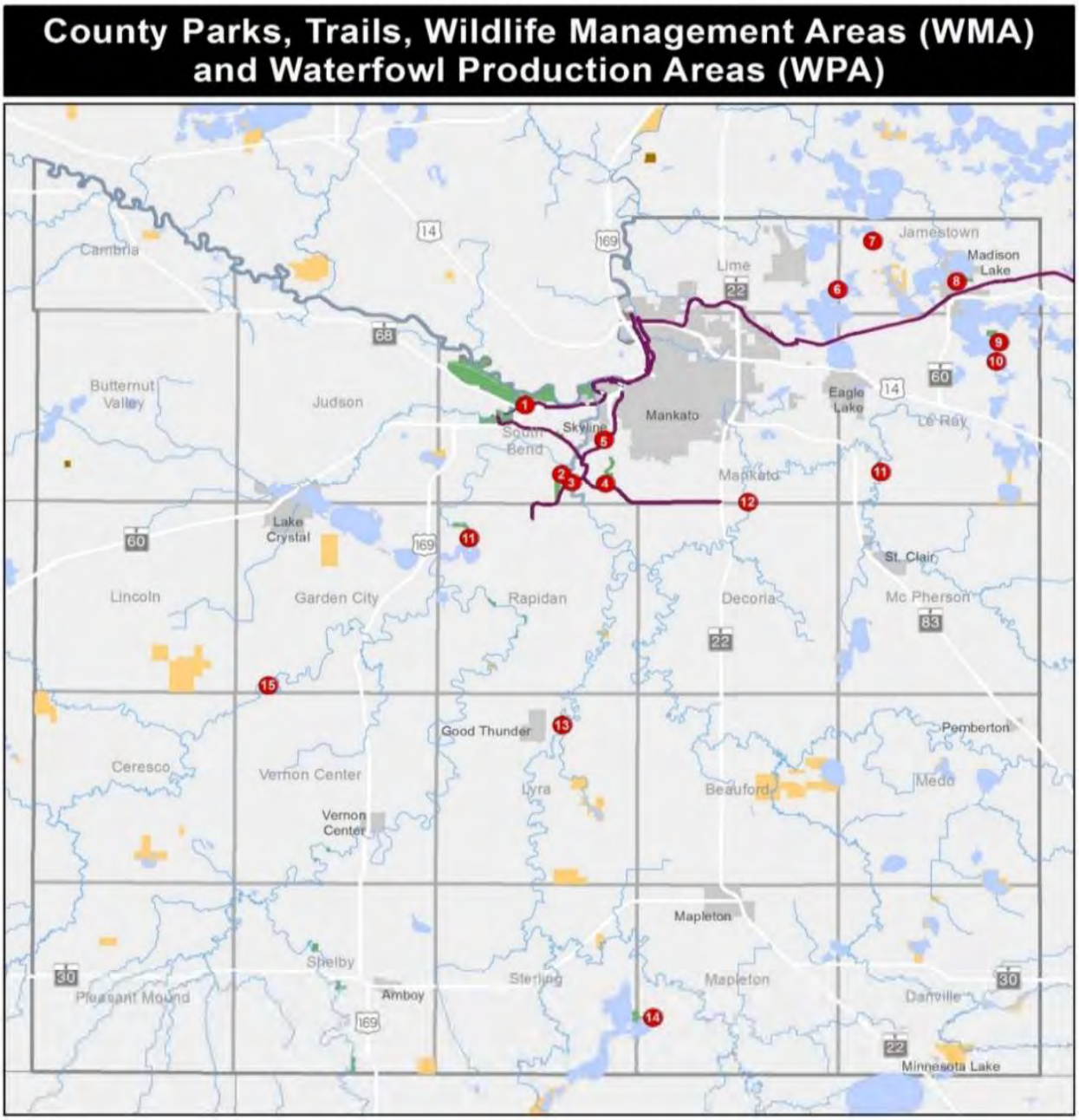
There are no County regulations for land used for crops other than buffers of perennial vegetation along public waters in the shoreland ordinance and the Minnesota Buffer law regulates perennial vegetation along public waters and ditches.

Feedlots are regulated by the County Livestock Manure ordinance and MPCA feedlot rules.

Public Lands and Recreation Areas

Blue Earth County is home to a variety of publicly owned lands for hunting, wildlife, day use, camping, and water access (see Figure 24). These areas have value for open space and recreation.

Figure 24: County Parks, Trails, WMA's and WPA's



ID	Name	Type
1	Williams Nature Center	Conservation Area
2	Red Jacket Valley	Park
3	Red Jacket Trail	Park
4	Indian Lake	Conservation Area
5	Weagel	Wayside Rest
6	Eagle Lake	Wayside Rest
7	Lake George	Park
8	Duck Lake	Park
9	Bray	Park and Campground
10	Lone Pine	Wayside Rest
11	Wildwood	Conservation Area
11	Rapidan	Park and Campground
12	Hungry Hollow Stop	Wayside Rest
13	Shimek	Conservation Area
14	Daly	Park and Campground
15	Watonwan Stop	Wayside Rest

Parks

Minneopa State Park is along the Minnesota River and Minneopa Creek, three miles west of Mankato. The park encompasses 4,643 acres (7.25 square miles). The park was established in 1905 to preserve Minneopa Falls, the largest waterfall in southern Minnesota. American Bison were reintroduced to the park in 2015. Minneopa State Park provides year-round recreation opportunities, including camping, hiking, cross-country skiing and fishing.

All municipalities in Blue Earth County independently own parks. Blue Earth County owns nine parks, two conservation areas and five wayside/rest areas in the County.

- *Parks:* Bray Park, Daly Park, Duck Lake Park, Lake George Park, Rapidan Park, Red Jacket Trail Park, Red Jacket Valley Park, Schimek Park, Wildwood Park, and Williams Nature Center
- *Wayside/rest areas:* Eagle Lake Landing, Hungry Hollow Stop, Lone Pine Park, Watonwan Stop and Weagel Park
- *Conservation Areas:* Indian Lake Conservation Area and Schimek Park

Camping

Camping in public parks is available at Rapidan Dam Park along the Blue Earth River, Bray Park on Madison Lake, Daly Park on Lura Lake, Land of Memories Park at the confluence of the Blue Earth and Minnesota River in Mankato, and Minneopa State Park.

Trails

The Sakatah Signing Hills State Trail is in the northeast quadrant of Blue Earth County. The 39-mile converted rail-to-trail connects Mankato to Faribault in Rice County. Bicycling, hiking, skating, and snowmobiling are permitted uses. Horseback riding is also permitted on portions of the trail with a natural surface and requires a horse pass to be carried by each rider. Major trails in County include the Blue Earth County Red Jacket Trail, Minneopa Trail and South Route Trail.

Wildlife and Hunting

Seventeen Wildlife Management Areas (WMAs) and Waterfowl Production Areas (WPAs) and one Scientific and Natural Area are located throughout the County, providing more than 3,000 acres of public lands for hunting, trapping and wildlife watching. The Minnesota Department of Natural Resources (MNDNR) and US Fish and Wildlife Service also maintain lease or own land throughout the County.

Water access

The MNDNR, Blue Earth County, the City of Mankato, City of Madison Lake and City of Lake Crystal own public water accesses on the following water bodies: Madison Lake, Lura Lake, Loon Lake, Duck Lake, George Lake, Ballantyne Lake, Crystal Lake, Eagle Lake, Mills Lake, Rice Lake, Wita Lake, Ida Lake, Indian Lake, Blue Earth River, Minnesota River, Watonwan River and Le Sueur River.

Water trails

The Minnesota River, Blue Earth River and Watonwan River are Minnesota State Water Trails. A water trail is a stretch of river or lake that is mapped and managed especially for canoeing, kayaking, boating and camping. There are 35 Minnesota state water trails in the state that feature some of the best paddling anywhere in the state.

Snowmobile Trails

There are several snowmobile trails in the County. MNDNR administered Minnesota Snowmobile Trail Assistance Program grants to support maintenance and grooming snowmobile trails which were used on trails in Blue Earth County. Sakatah State Trail is owned by the MNDNR. The County does not own any snowmobile trails.

Mining

There is a wide variability in the size and scope of mining operations in the County. Some aggregate quarries are active only for one season to serve road construction projects. Other quarries are long-term sites that operate continuously over many years to decades. Auxiliary facilities can include crushers, wash plants and asphalt plants.

Resources Mined in Blue Earth County

Aggregate includes sand, gravel and crushed stone.

Sand and gravel are naturally occurring sediment sorted and deposited by flowing water.

Crushed stone is a product of mechanically breaking down bedrock like granites, limestones, quartzites, and basalts.

Silica sand is a product of quartz-rich sandstone.

Dimension stone is natural rock material quarried for the purpose obtaining slabs or blocks.

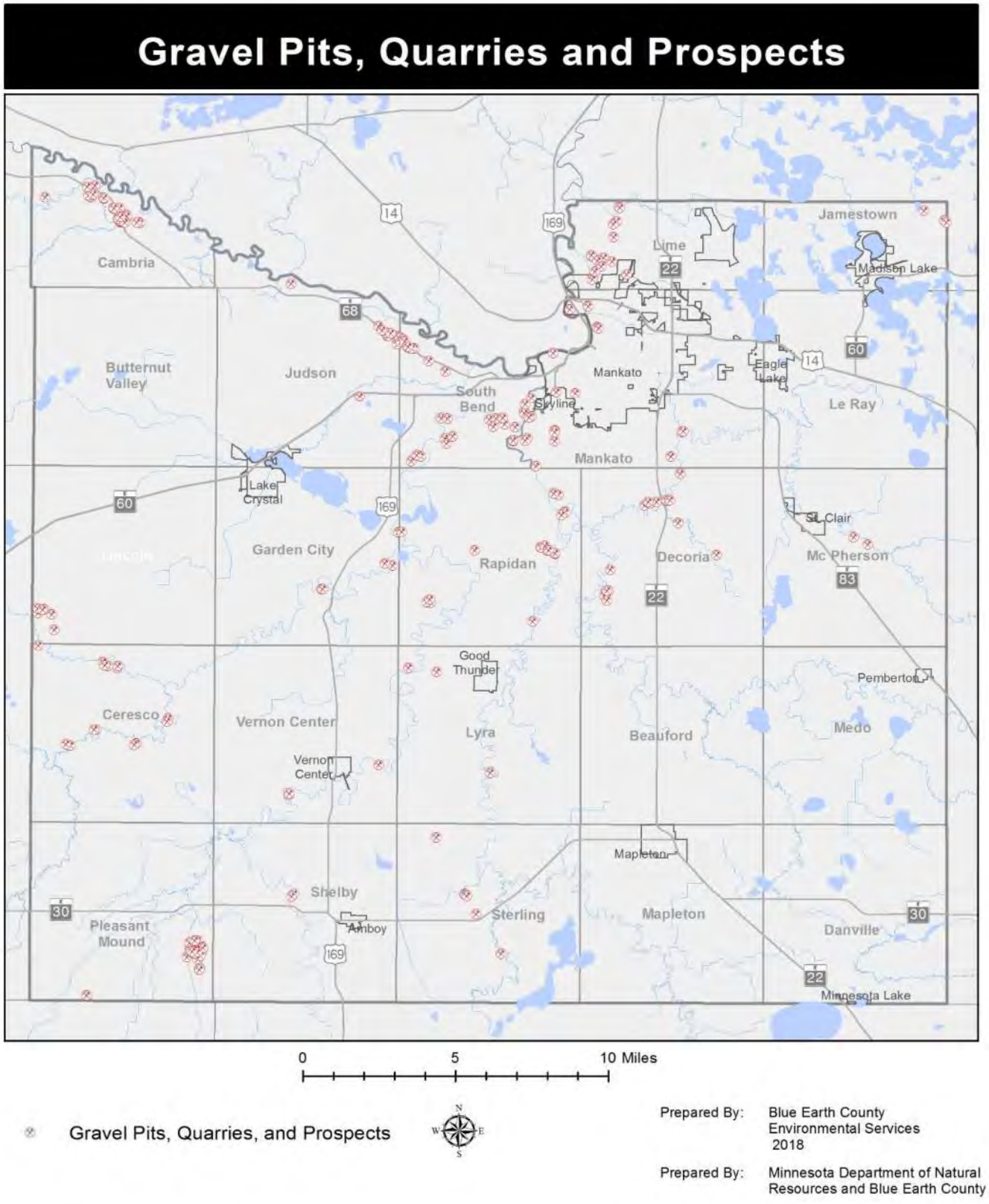
There are an estimated 167 aggregate mining sites and seven quarries in Blue Earth County. However, not all 167 mines are in use. The largest mining sites in the County are limestone and silica sand quarries along the Minnesota River valley in Lime Township and the City of Mankato. Most of the aggregate mines in the County are located along river valleys of the Minnesota, Blue Earth, Le Sueur, Watonwan, Maple, Big Cobb, Willow Creek, Perch Creek, and Providence Creek. Figure 25 displays the location of active and inactive mines in the County.

Aggregate mining is the most common form of mining in Minnesota and in the County. Because aggregate is relatively inexpensive to mine but expensive to transport, most operations are located close to where the material will be used.

The need for aggregate materials for construction projects and infrastructure increases along with a strong economy. Aggregate makes up 80 percent of concrete and 90 percent of asphalt. Approximately 50 percent of aggregate is used for public roads and public works. A local supply of aggregate is an important sustainability issue for maintaining and developing communities of all sizes. Not all sand and gravel deposits meet the specifications for road and bridge construction.

Silica sand has been mined in the Upper Midwest for over a century. Uses for this resource include a variety of products and applications like glass-making, abrasives, bedding for livestock, golf course sand traps, and frac sand.

Figure 25: Location of Active and Inactive Mines in Blue Earth County



Increased demand for frac sand corresponded with a rapid expansion of shale oil and gas development. Silica sand mines producing frac sand may or may not process the sand on-site.

All stakeholders benefit from good mine planning and effective reclamation of mines sites. Whether in populated areas or in rural settings, mining is often regarded as an unwelcome neighbor. Key concerns voiced by the public typically relate to odors, dust, noise, traffic, public safety, groundwater protection, loss of habitat and scenic views, and final reclamation. In addition, particle pollution of ultrafines is a concern related to silica sand mining.

The MNDNR Mining and Minerals has mapped the availability of aggregate resources in many Minnesota counties, including Blue Earth County (see Figure 25). The purpose of the aggregate mapping project is to promote orderly and sound development and introduce aggregate resource protection into local comprehensive plans and local controls in accordance with Minnesota Statute 84.94. Most of the aggregate resources in the County are in river corridors.

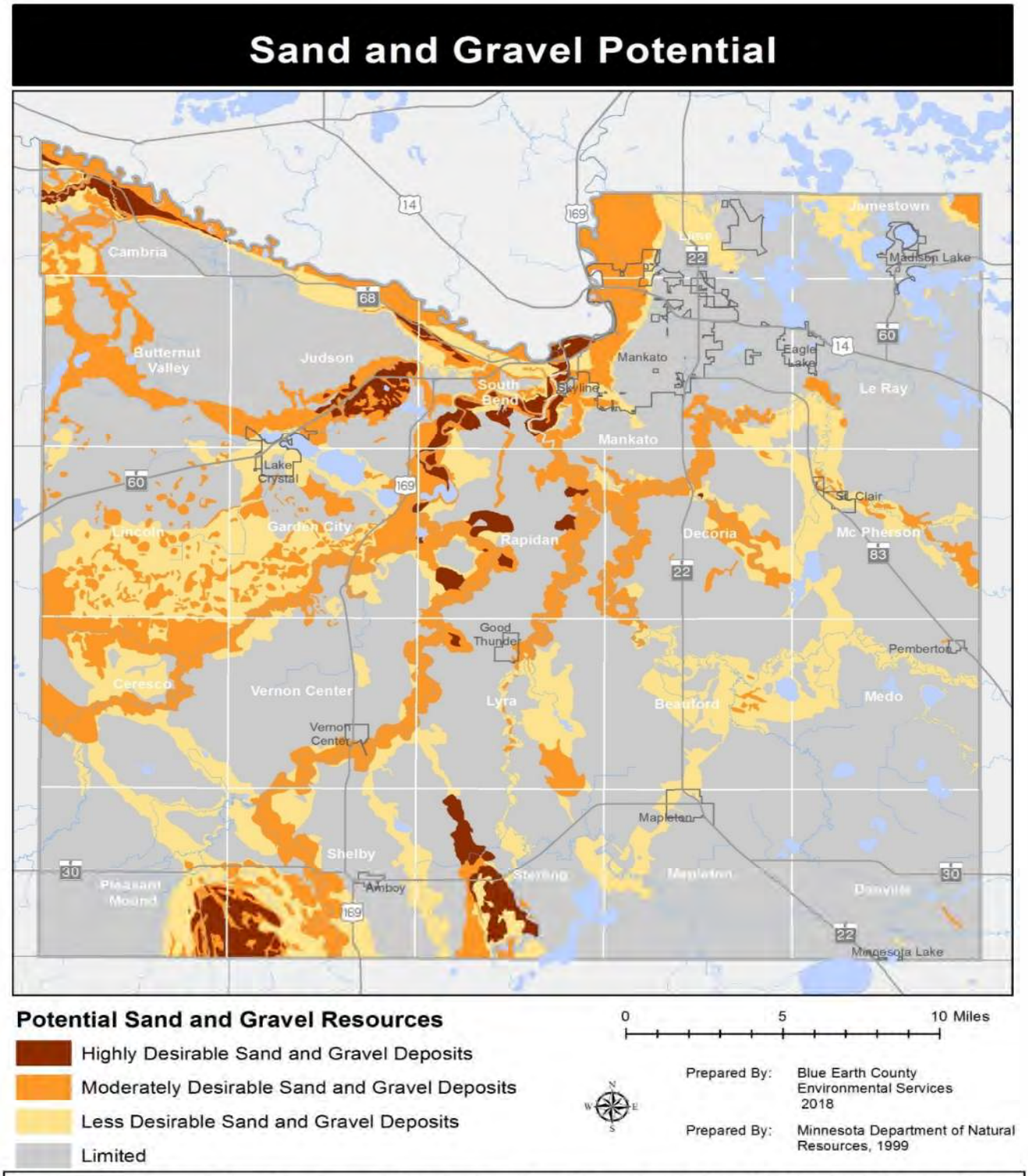
The MNDNR mapped exposures of near surface occurrences of silica sand in the County are limited to a relatively thin ribbon along the Minnesota River Valley near Mankato and the lowest reaches of the Blue Earth River and Le Sueur River.

Mining Regulations

Blue Earth County is responsible for all mineral excavation permitting and regulation in unincorporated areas, except in Mankato Township and Lime Township. The Blue Earth County Zoning Ordinance: Chapter 24. Zoning, Article VII. Mineral Extraction, declared County policy is "to provide for the reclamation of land disturbed by mining to encourage productive use of land to aid in maintaining or improving the tax base, and protect the health, safety, and general welfare of the people, as well as the natural beauty and aesthetic values in the affected areas of the County." A conditional use permit is required that typically address issues such as: hours of operation, noise, traffic, dust, and reclamation. Performance bonds or some other form of financial assurance may be required.

In general, state agencies have no regulatory role in administering or reviewing local permits. In shoreland, the DNR does have review authority. Depending on the size and scope of the mining operation, however, some MNDNR, MPCA, and USACE permits and regulations may apply to certain mining operations and associated access roads, building sites, storage areas, water retention ponds, wetlands and groundwater. The Environmental Quality Board rules require environmental review in the form of an Environmental Assessment Worksheet (EAW) for operations excavating 40 or more acres of land at a mean depth of 10 feet and Environmental Impact Statement (EIS) for operations exceeding 160 acres.

Figure 26: Sand and Gravel Potential



Highly Desirable Sand and Gravel Deposits consist of sand and gravel with thickness ranging from 10 to 50 feet with less than 15 feet of overburden.
Moderately Desirable Sand and Gravel Deposits are moderately to very large in extent with sand and gravel thickness ranging from 0 and 40 feet with less than 20 feet of overburden.
Less Desirable Sand and Gravel Deposits are small in extent and consist of Sand and fine sand with thickness ranging from 0 and 20 feet with overburden thickness between 0 and 80 feet. (MN DNR, 1999)

Mining Reclamation

Reclamation, at its most basic level, is a process that results in a safe and non-polluting mining site that will retain some land value. For example, gravel operations may be graded after closure to remove hazardous steep slopes. Revegetation, erosion control, and site cleanup are included in basic reclamation operations.

Reclamation of aggregate mining sites has not been a routine practice at sites established prior to the 1990s. Problems associated with these sites may include: 1) public safety concerns such as steep pit walls and deep water, 2) colonization by noxious weeds and other unwanted vegetation, 3) unauthorized activities such as illegal dumping, target shooting, off-road vehicle use, and parties, and 4) erosion and possible pollution of downstream water bodies. There may be no responsible party and/or no money to do reclamation on abandoned sites. Costs to reclaim these sites may be higher because unwanted vegetation must be cleared, and landforms reconstructed. Topsoil is needed for revegetation, and often the topsoil has been removed from un-reclaimed sites.

Blue Earth County and the City of Mankato acquired two inactive aggregate mines for parklands and open space along County Road 1 (Old Highway 66) in Mankato Township near the confluence of the Le Sueur River and Blue Earth River.

A Master Plan for Mining Reclamation Framework was developed for Blue Earth County in 2006 during development of the Greenprint because most aggregate mines and potential aggregate, stone and silica sand resources are in the Greenprint corridors. The framework was prepared after numerous meetings of concerned citizens, government officials and business interests. Recommendations included development of a comprehensive mining land use plan with Lime Township and Mankato Township to protect resources while promoting sustainable environmental and recreational post mining uses and reclamation.

As recommended in the MNDNR "A Handbook for Reclaiming Sand and Gravel Pits in Minnesota", at a minimum mining plans should address an assessment of pre-mining conditions, surface and groundwater protection, environmental permits, description of mining methods, auxiliary facilities, transportation routes, site management, staging operations, post mining management, and final reclamation. MNDNR Silica Sand Reclamation Plan requirements should be considered as minimum reclamation requirements. Performance bonds should be required to address mining operations through final reclamation.

Future Growth and Development

Future growth and development in the County should support safe and reliable transportation systems; resilient communities; protection and preservation of natural resources, environmentally sensitive and scenic areas; and agricultural land.

In unincorporated areas of the County, preservation of both agriculture and natural resources support the rural character, scenic value and quality of life vision for the County. Agriculture is the primary land use in the County and vitally important to the local economy. Avoiding conflicts of residential and non-farm development with agricultural land uses and preserving agricultural land is a priority.

Impacts to natural resources and environmentally sensitive areas should be reviewed for land development in the County. Areas identified through Blue Earth County's Greenprint should be considered. The Blue Earth County Greenprint is a strategically planned interconnected network of waterways, wetlands, woodlands, wildlife habitat, conservation lands, and open spaces that support natural ecosystems. The Greenprint identifies priority areas and provides a planning framework for conservation and development that contributes to the health and quality of life for communities and people.

Commercial and industrial land uses in the County are important to the local economy and quality of life as the County's position as a regional center is expected to grow. Most municipalities in the County have capacity to provide urban services and land available for industrial, commercial and residential development. Growth of the commercial and industrial economy is best supported with new and in-fill development in areas where access to transportation, water, wastewater and stormwater systems can be provided in municipalities. Higher intensity uses should be steered toward municipalities. For example, multi-lot residential subdivisions, industrial uses, commercial corridors, or other uses which require large parking areas or impervious surfaces or are best served with connection to municipal water and/or sewer. Municipalities in the County are also well connected to established transportation systems and significant freight corridors important to the region's and state economy, including US Highways 169 and 14, MN Highways 60, 22, and 83.

Future growth and development in the urban fringe districts near Mankato, Eagle Lake and Madison Lake should be steered to the municipalities and be consistent with orderly annexation agreements, land use plans of the affected jurisdictions, MAPO transportation plans, MATAPS, and other local and regional transportation plans, protection of natural resources, the County Greenprint, County Land Use Plan, and other local and regional plans.

Development in the County should be planned in a manner consistent with the Blue Earth County Highway Access ordinance, MNDOT guidelines, MAPO transportation plans and MATAPS. Low intensity zoning classifications should be maintained to preserve future right-of-way, particularly near municipalities, commercial corridors, freight corridors and the urban fringe overlay district.

Chapter 7 – Economy

Agriculture

The agricultural industry is a key economic driver in Blue Earth County. In 2012, the U.S. Department of Agriculture found that the total market value of products sold generated in Blue Earth County exceeded $500 million (52 percent from crop sales and 48 percent from livestock sales). This number is an increase of nearly $178 million from the 2007 Census of Agriculture. In addition, Blue Earth County ranks second across all Minnesota counites for livestock inventory (hogs and pigs), fourth the state for the value of livestock, poultry, and their products, and sixth for the total value of agricultural products sold. These numbers indicate the importance of this industry to Blue Earth County's local economy and support the long-standing goal of protecting and promoting the agricultural industry throughout Blue Earth County.

The livestock industry in Blue Earth County is thriving and is a vital part to the local economy. Over the past 30 to 40 years there have been many changes to the industry. Modern livestock production involves fewer, but larger, totally confined feedlots. Total confinement is continuing to replace open lots and partial confinement. There is no doubt that the swine industry leads the way in Blue Earth County. A major factor for this trend is the value of manure for crop production. Livestock manure provides a great alternative to commercial fertilizer, which contains the required nutrients needed to grow healthy crops.

As seen in Table 12, the total number of animal units has increased over the past twenty years, while the overall number of feedlots has declined. This is directly related to the number of large total confinement barns that Blue Earth County continues to see.

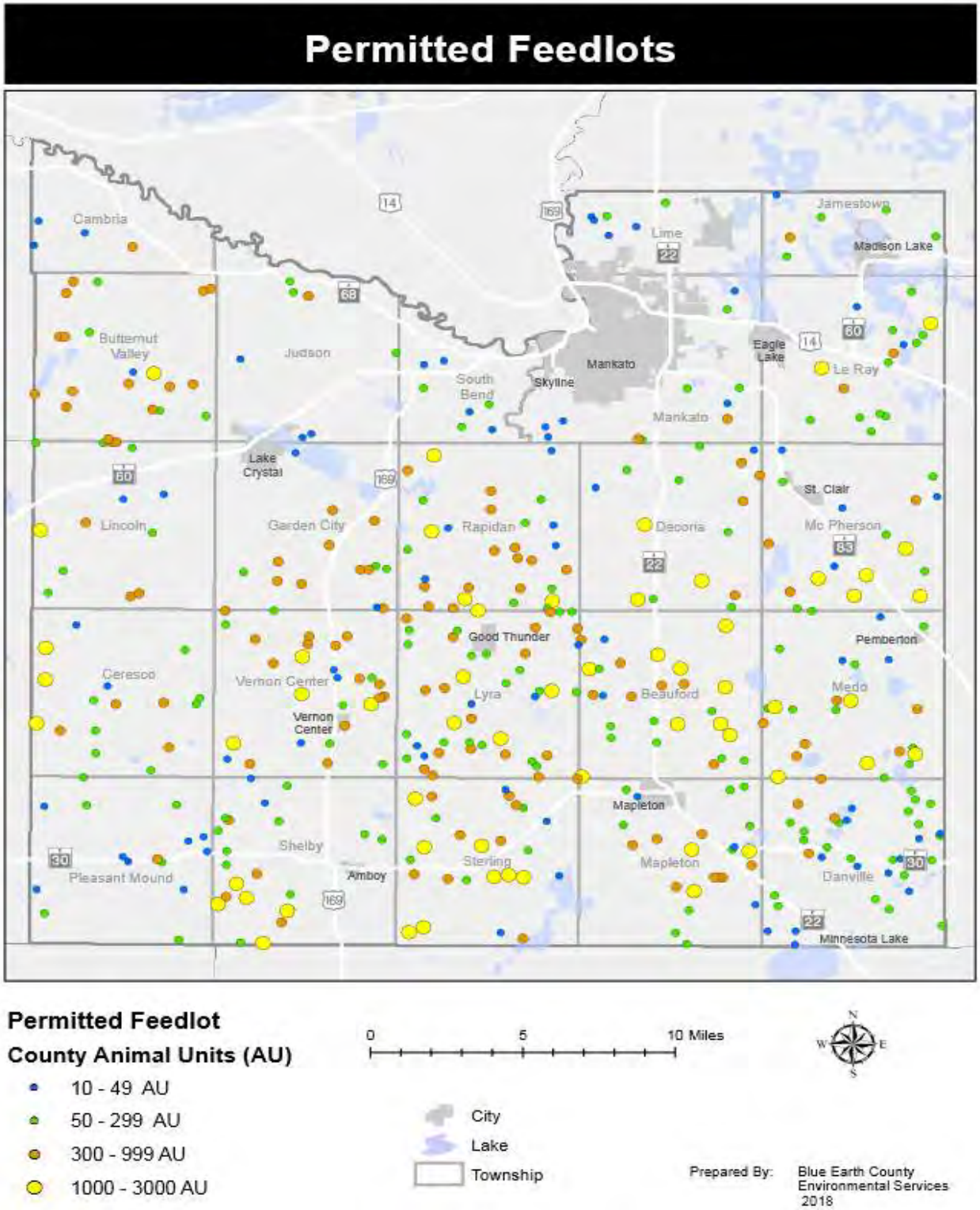
Table 12: Number of Feedlots by Animal Unit Category

Animal Unit Category	Year/Number of Feedlots		
	1998	2008	2018
50 AU or Less	107	107	111
51 to 300 AU	224	171	136
301 to 600 AU	62	43	37
601 to 1,000 AU	47	79	85
Over 1,000 AU	28	40	56
Total Number of Feedlots	468	440	425
Total County Animal Units	156,027	185,353	209,776

Source: Blue Earth County Environmental Services

Blue Earth County's agricultural district is made up of rich, fertile soil, which provides great opportunities for successful crop production. Corn and soybeans are the primary crops that are grown in the County, however there are some small grains, peas, and sweet corn that are also grown in the County. According to the 2012 Census of Agriculture, there are 376,460 acres in crop production in the County. Crop production is vital to the local economy throughout Blue Earth County and the surrounding area. Crop production not only provides local jobs, it provides nourishment to thousands of people as well as livestock. Crop production is getting more advanced as the years pass, and yields continue to increase.

Figure 27: Permitted Feedlots in Blue Earth County



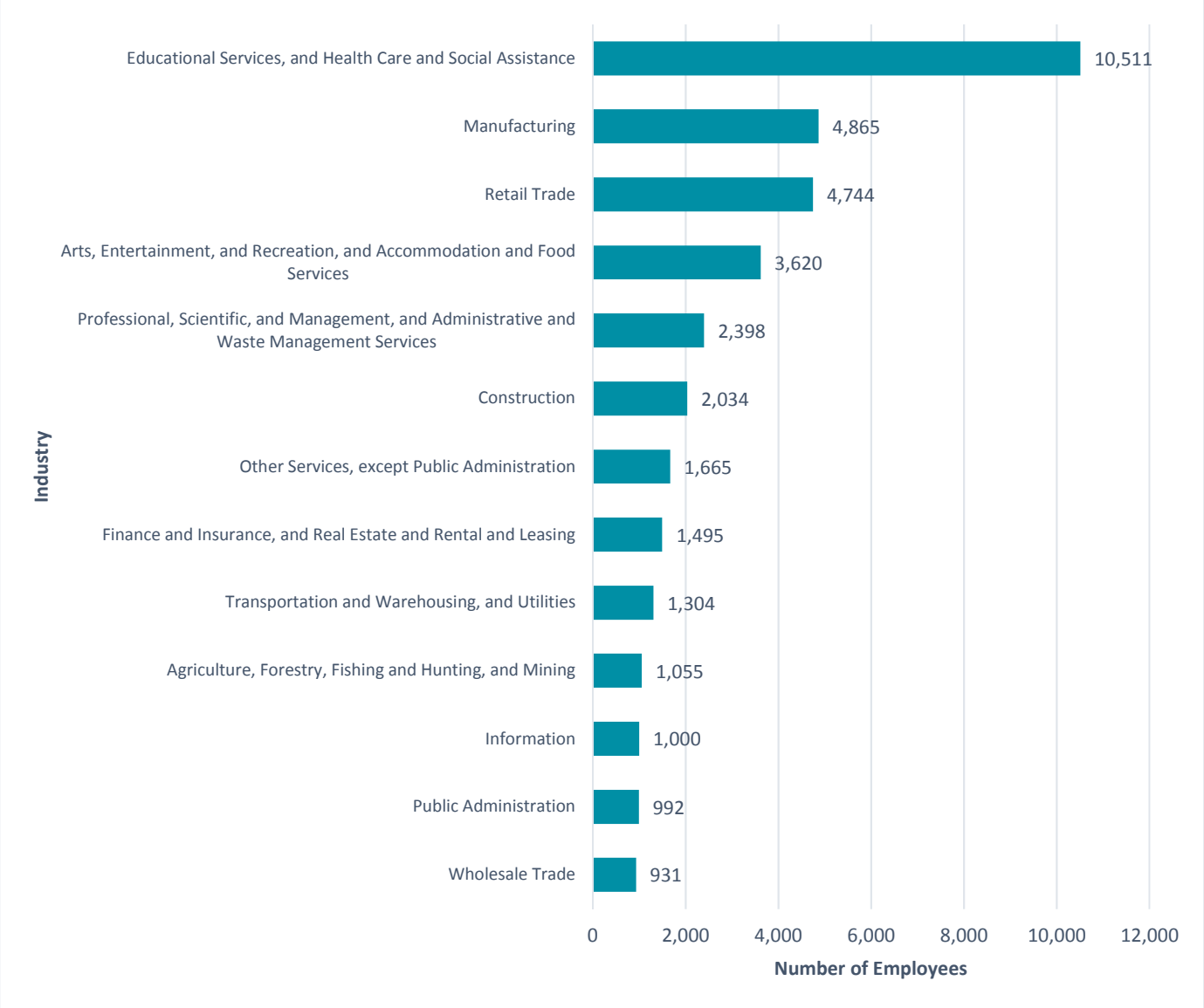
Blue Earth County is also home to many smaller scale farming operations that produce different varieties than typical row crops. Vegetable farms, tree farms, apple orchards, vineyards and other crops produced at a smaller scale supply nutritious foods or plants and are important to the local economy. These are all important pieces of

agriculture in Blue Earth County. Vegetables, apples and grapes can be found at local farmers markets and wineries. Blue Earth County is home to two wineries, one retail apple orchard and several farmers markets.

Employment by Industry

The American Community Survey (ACS) divides Blue Earth County's economy into several industries. Education and health care services, which accounted for more than 28 percent of local jobs in 2016 appears to be the main contributor to the local economy. Other primary industries include manufacturing (13.3 percent), retail trade (12.9 percent), and Arts, Entertainment, and Recreation, and Accommodation and Food Services (9.9 percent) (see Figure 28).

Figure 28: Employment by Industry, 2016



Source: United States Census 2016

The number of employees per industry fluctuates in correlation with market changes. The "other services" category experienced a 35 percent increase between 2010 and 2015. Other growing industries include professional services (16 percent) and educational and health care services (15 percent). The information industry

experienced the biggest loss of employees over the same time (25 percent). The information contained in Figure 28 shows agriculture, forestry, and mining accounting for less than 3 percent of the total jobs in Blue Earth County. This can be somewhat misleading because components of the agricultural industry employ individuals in many of the other listed categories.

Blue Earth County and the region serves as a regional hub for health care, education, retail, agriculture, and industry in southern Minnesota. The 2011 final Report of the Mankato Area Transportation and Planning Study (MATAPS) provides a description of the local economy in the Mankato area which is divided into three major components including:

- **Manufacturing Activities:** The primary industrial activity within the Mankato area continues to be centered on agricultural products and food manufacturing. Harvest States, Cargill, Hubbard and Archer Daniels Midland (ADM) are large processors of agriculture-related products in the Mankato area. The area also serves as a large supplier of crushed limestone, dimension limestone quarry rock and silica sand.

- **Government and Education Activities:** The Mankato area serves as a regional center for several Federal, State and County government offices and educational services. Prominent among the governmental buildings are the County courthouse, government center, Justice Center, Minnesota Department of Transportation's District 7 Headquarters, the U.S. Army Reserve, National Guard Training and Community Center. Students have historically accounted for approximately 25 percent of the population in the Mankato area. Post-secondary educational facilities include the Minnesota State University, Mankato Rasmussen College, South Central College, and Bethany Lutheran College.

- **Medical and Professional Services:** The Mankato area acts as a regional medical center for much of southwest Minnesota. Continued expansion of the medical facilities and staff is expected as additional specialties are added and growth in hospital service continues to increase. Additional professional employment opportunities in the Mankato area have increased with the need for doctors, lawyers, accountants and computer professionals to serve the growing population and geographic area.

Median Household Income

The 2016 Median household income for Blue Earth County was $52,119, comparable to that of the United States of $55,322. The median household incomes for Blue Earth County, the State of Minnesota and the nation are shown in Table 14. The median income in Blue Earth County is substantially lower than the median household income in the State of Minnesota. This gap may be the result of a higher number of college students. While employment figures have improved following the recession, incomes have taken longer to rise to pre-recession levels.

Table 13: Household Median Income

Geography	2016	2010
Blue Earth County	$52,119	$47,871
Minnesota	$63,217	$57,243
United States	$55,322	$51,914

Source: United States Census 2010 and 2016

Employment Rates

Healthy employment rates speak to the strength of a local economy and its ability to support existing businesses and attract new businesses and residents. Table 13 compares employment statistics for Blue Earth County to the State of Minnesota and the nation, including Labor Force Participation, or percent of employed individuals 16 years and over, for 2016, as well as the unemployment rate. The data indicates that Blue Earth County's economy, measured in jobs, is stronger compared to Minnesota and the nation. The labor force participation rate is higher in Blue Earth County and the unemployment rate is lower. However, Blue Earth County experienced a labor participation rate decline of 2.5 percent from 2010 to 2016.

Table 14: Employment Rates

Geography	Labor Force Participation 2016	Percent Change from 2010	Unemployment Rate 2016	Percent Change from 2010
Blue Earth County	71.3%	-2.5%	4.9%	-1.1%
Minnesota	69.9%	-1.1%	4.8%	-1.6%
United States	63.5%	-1.5%	7.4%	-0.5%

Source: United States Census 2010 and 2016

Chapter 8 - Transportation

Historically, transportation corridors have influenced population growth and directed patterns of development. The ability to move people and goods from one location to another in a manner that is effective and efficient is essential for economic development.

Transportation System Management Tools

Planning and zoning plays an important role in access management and right-of-way preservation. The MAPO 2045 Long Range Transportation Plan (LRTP) system management tools include Minnesota Department of Transportation (MnDOT) guidelines for access management, traffic control devices, and right-of-way (ROW) preservation. These tools can be used to maximize the efficiency and safety of current systems and preserve corridors for future transportation systems in the Mankato/North Mankato MAPO area as well as Countywide.

Access Management

Unrestricted or unmanaged access is a direct contributor to roadway congestion and safety problems. As the number of roadway intersections per mile increases, the opportunity for crashes increases. The existence of too many intersections per mile also increases delay and congestion for automobiles, transit, and freight.

Access management seeks to provide an appropriate balance between mobility needs and connections to property. Good access management supports a wide array of transportation system goals. These goals include creating a safe travel environment for all modes and users of transportation systems, encouraging a balance between roadway capacity and accessibility, and encouraging an active transportation system.

At the city and County level, management of the number, location, design, and operation of access features, such as driveways and street intersections, is accomplished through municipal and County land use and access management policies, zoning and subdivision ordinances, and site plan review processes. At the state level, the Minnesota Department of Transportation (MnDOT) regulates access using its Access Management Manual, developed in 2008. The guidelines in this manual address the spacing of public street connections, traffic signals, and the allowance of driveways to the state trunk highway system.

Legal Basis for Access Management (Source: MAPO)

Chapter 8810 in the Minnesota State Statutes directs public road authorities to provide "reasonable, convenient, and suitable" access to property unless these access rights have been purchased. Courts have interpreted this to allow:

- Restrictions of access to right-in/right-out
- Redirection of access to another public roadway if the roadway is reasonable, convenient, and suitable

In addition to the above, land use authorities may exercise additional authority in limiting access through development rules and regulations. Land use authorities may require:

- Dedication of public rights-of-way
- Construction of public roadways
- Mitigation of traffic and/or other impacts
- Change in and/or development of new access points

In special circumstances, broader authority (police power) has been given to public agencies if the situation is deemed to jeopardize public safety. However, this is a very high standard to meet and is seldom used by public agencies.

Blue Earth County Code, Chapter 18, Article III. Highway Access Management

The Board of Commissioners recognize the need for regulation of entrances from adjoining lands to the traveled way of the County state aid highways and the County road systems under their supervision to promote the public safety, efficient flow of traffic, the aesthetic values, and engineering integrity of said road systems. A written access permit, issued by the County Engineer, shall be required before construction, alteration, or change of use of an access, whether a driveway or a field entrance, within any Blue Earth County right-of-way. Access permit applications will be reviewed taking into consideration the current Blue Earth County Transportation Plan.

Examples of when an access permit is required include:

- A new access onto a County Road or County State Aid Highway. Note: A property split does not necessarily create a right for a new access for contiguous parcels.
- Revised use of or improvement to an existing access onto a County road or County state aid highway. Note: Access permits are granted for a specific use. If the land owner proposes to change the current use of an access point, a new permit is required since the location of a drive may be suited for one use but not for another. This includes changing the use of an existing field approach.
- Development proposal or plat adjacent to an existing or proposed County road or County state aid highway. Note: "Development" includes a change in land use designation, subdivision of land or lot split, or any commercial or industrial use of land.

Property that is considered for rezoning, for commercial, residential, or industrial use, shall be reviewed by the County engineer or his/her designee(s) to insure an access compatible to the zoning can be granted. Spacing shall be consistent with the Blue Earth County Transportation Plan.

The design of all new roads intersecting and entrances onto Blue Earth County roadways shall meet MnDOT standards, the Blue Earth County Transportation Plan, County Ordinances and as required by the County Engineer. The County may require access be provided through combined service roads, directed onto roadways with lower traffic volume or lower functional classification, and right in/right out access may be required.

Developers shall install right-turn lanes on the County road or County state aid highway at their expense at all subdivisions and public roads, or any entrance serving commercial or industrial property that is estimated to generate over 100 right turns per day. A left-turn bypass lane may be required if warranted in MnDOT's Road Design Manual. Turn lanes and/or bypass lanes may be required if other similar accesses along the same segment of the roadway already have turn lanes and/or bypass lanes. Turn lanes and bypass lanes shall be designed and constructed to Blue Earth County standards. If turn lanes or bypass lanes cannot be constructed due to limitations in right-of-way, the developer shall be required to pay an amount determined by the County engineer, pursuant to state standards, to be adequate to cover the cost of such items.

Roadways

Blue Earth County has a total of 744 miles of county roads, 631 miles of township roads and 154 miles of trunk highways, each under a different jurisdiction. The County has responsibility over the 744 miles of county roads for general maintenance, snow removal, and pavement preservation, and will work with the Townships and the MnDOT on roadways in their respective jurisdictions.

Right of Way Preservation and Acquisition

Right-of-way (ROW) is a valuable public asset. Therefore, it needs to be preserved and managed in a way that respects the roadways' intended function while serving the greatest public good. When future expansion or realignment of a roadway is proposed, but not immediately programmed, agencies should consider right-of-way acquisition strategies to reduce costs and maintain the feasibility of the proposed improvement. The most common strategies used to preserve right-of-way for future construction include advance purchase, eminent domain, planning and zoning, and official mapping. Before implementing any right-of-way preservation programs, local agencies should weigh the risks of proceeding without environmental documentation prior to purchase. If environmental documentation has not been completed, agencies risk preserving a corridor or parcel that has associated environmental issues.

Direct Purchase

The best ways to preserve ROW is to purchase it. Unfortunately, agencies rarely have the necessary funds to purchase ROW in advance, and the public benefit of purchasing ROW is not realized until a roadway or transportation facility is built. Most typically, local jurisdictions utilize various corridor preservation methods prior to roadway construction and then purchase the ROW if it has not already been previously dedicated, at the time of design and construction.

Planning and Zoning Authority

Local agencies have the authority to regulate existing and future land use. Under this authority, agencies have several tools for preserving ROW for transportation projects. These tools include:

- **Zoning** – If the property is in a very low-density area (e.g., agricultural district), MAPO partnering agencies should maintain the existing zoning classification. A low-density zoning classification limits the risk for significant development and can help preserve land for potential ROW until funding becomes available for roadway construction.
- **Platting and Subdivision Regulations** – Cities and counties can require ROW dedication as part of the platting and subdivision process. The respective agencies platting, and subdivision regulations provide authority to consider future roadway alignments during the platting process because most land must be platted before it is developed. Each local agency can use this authority to regulate land development and influence plat configuration and the location of proposed roadways. Planning and engineering staff work with developers to formulate a plat that meets development objectives and that conforms to a long-term community vision and/or plans.
- **Official Mapping** – A final strategy to preserve ROW is to adopt an Official Map. An Official Map is developed by the local governmental unit and identifies the centerline and ROW needed for a future roadway. The local agency then holds a public hearing showing the location of the future roadway and incorporates the official map into its thoroughfare or community facilities plan.

The official mapping process allows agencies to control proposed development within an identified area, and to influence development on adjacent parcels. However, if a directly affected property owner requests to develop

his/her property, agencies have six months to initiate acquisition and purchase of the property to prevent its development. If the property is not purchased, the owner can develop it in conformance with current zoning and subdivision regulations. As a result, the official mapping process should only be used for preserving key corridors in areas with significant growth pressures.

Rail Operations

Blue Earth County is served by one of the four Class I railroads, the Union Pacific Railroad Company and a Class II railway, the Canadian Pacific Railroad Company. The primary commodities originating within the County include grains, processed grain products, ethanol, silica sand and mixed manifest trains. The region does not currently have passenger rail service; however, MnDOT has prepared a plan that envisions statewide passenger rail service, including a route from Mankato to Minneapolis. The Council will continue to be involved in discussions related to potential passenger rail service as lead by MnDOT.

Aviation

Blue Earth County is home to the Mankato Regional Airport. Located five miles northeast of Mankato, the airport consists of two runways. The airport provides freight and express service through a private carrier. The Mankato Regional Airport is also home to pilot training in conjunction with the Department of Aviation at Minnesota State University-Mankato- A private carrier - provides chartered air service based out of the Mankato Regional Airport.

The 2006 Mankato Regional Airport Zoning Ordinance regulates and restricts the height of structures and objects of natural growth and regulates the use of property near the Mankato Regional Airport by creating the appropriate zones and establishing the boundaries.

Scenic Byways

The Federal Intermodal Surface Transportation Equity Act of 1991 (ISTEA) created a National Scenic Byways Program to designate and protect roads that provide an enjoyable travel experience. These corridors offer an alternative travel route to our major highways and daily travel patterns, while telling a story about Minnesota's heritage, recreational activities or beauty. A portion of the Minnesota River Valley Scenic Byway goes through Blue Earth County on the portion of State Highway 60 near the Minnesota River.

Natural Preservation Routes

In October 2014, the County and MNDOT agreed to designate a segment of County Road 1 (Old Highway 66) from CSAH 90 to the Mankato City Limits a Type III Natural Preservation Route, in accordance with MnDOT SALT Rules 8820.4010 Subparts 1 and 4, to facilitate preservation of the scenic and natural beauty of this segment. This designation within Minnesota's County State Aid Highway system allows roadway designs to be more compatible with their natural surroundings than would typically be allowed under state-aid standards.

All-Terrain Vehicle Permits

The Blue Earth County Board of Commissioners adopted an ATV ordinance allowing the use of all-terrain vehicles and mini trucks on County state aid highways and County roads within Blue Earth County by permit which is required as part of State statute.

Non-Motorized Facilities

Bicycle and Pedestrian

Most municipalities in the County have sidewalks on a traditional grid system. Some municipalities also have city trails. Most residential subdivisions in unincorporated areas of the County do not contain sidewalks or trails for

pedestrians or bicycles. Off road trails and paved shoulders along County roads provide opportunities for both recreational use and transportation. Multipurpose, regional trail systems in the County include trails owned by Blue Earth County and the State of Minnesota. The regional trail system serves mainly the northern part of the County where there is the greatest population density, providing connectivity to local trails, recreation areas, and communities in the area. Blue Earth County works with other local and state government agencies to identify opportunities to connect local and regional trails. Enhancing these non-motorized facilities, as part of the overall transportation system, is a key element to providing a transportation system that is sustainable, links destinations and attractions, and encourages healthy and active lifestyles.

Multi-purpose regional trail systems in the County include:

- Minnesota River Trail
- Red Jacket Trail
- Sakatah Singing Hills State Trail
- South Route Trail
- Minneopa Trail

Transit

Affordable and convenient transit is an essential need of highly developed urban and suburban communities. The growing demand and opportunity for convenient and reliable transit service is fueled not only by the aging of the County's population but also by its increasing diversity, growth, and densification. Providing convenient, reliable, and robust transit service can play a vital role in supporting mobility, access, and economic development. For those most dependent on transit—older adults, people with disabilities, youth, people with lower incomes, and some Veterans— lack of transportation options is a significant issue. Meeting the transportation needs of Blue Earth County residents requires a complete transportation system incorporating a variety of transportation modes.

As a MAPO partner, Blue Earth County supports strategies to maximize resources through collaboration and coordination of transit providers and human service agencies, with a focus on meeting user needs and interagency coordination.

Public Transit

Mankato's Transit System (MTS) is the Greater Mankato area's transit operator serving neighborhoods and commercial corridors within the cities of Mankato and North Mankato as well as the MSU, Mankato's campus area. Paratransit is offered in the Mankato/North Mankato service area in conjunction with the fixed route hours of operation.

Additional Transit/Public Transportation Services

TRUE Transit provides rural County-wide public transportation service for Blue Earth, Nicollet and Le Sueur Counties. TRUE, which stands for "Town, Rural, Urban Express," offers scheduled routes and community dial-a-ride service. True Transit fares are subsidized by MNDOT and County governments.

The Volunteer Interfaith Network Effort (VINE) is a volunteer-based initiative providing transportation for individuals age 60 and older in Blue Earth and Nicollet counties and on a limited basis for individuals with disabilities. VINE's senior transportation service is supported through donations and funding through Blue Earth County Human Services. VINE also provides transportation for single parents, immigrants, and other low-income

workers. VINE Faith in Action, Greater Mankato Area United Way, and Blue Earth County Employment Services jointly sponsor the program for low income individuals.

Jefferson Lines offers a College Connection, which provides regional service to the Twin Cities and other destinations including North Dakota, Iowa, Wisconsin, and Oklahoma.

Land to Air Express provides intercity bus service along Highway 14 between Mankato, Waseca, Owatonna and Rochester and along Interstate 90 between Mankato, Albert Lea, Austin and Rochester. These services are supported by FTA Section 5311 (f) intercity bus program funding managed by MnDOT. Land to Air Express also provides service from Mankato to the Minneapolis – St. Paul International Airport on a wholly private basis by Land-to-Air Express.

Transportation Plans

In Blue Earth County, the following transportation plans provide a system to support economic development, encourage sustainable growth, and improve mobility and access for area residents and businesses:

- Mankato Area Transportation and Planning Study (MATAPS)
- Mankato/North Mankato Area Planning Organization (MAPO)

Background and Transportation Planning History

The Mankato/North Mankato Area Planning Organization (MAPO) was established in 2012 in response to the 2010 U.S. Census which designated the Mankato/North Mankato area as an urbanized area requiring the formation of a metropolitan planning agency. The purpose of the MAPO is to meet and maintain a continuing, cooperative and comprehensive metropolitan transportation planning process.

Prior to the establishment of the MAPO, government and agencies in the Mankato/North Mankato area have cooperatively worked on transportation planning by creating the Mankato Area Transportation and Planning Study (MATAPS). The MATAPS partnership included: Minnesota Department of Transportation District 7, Region Nine Development Commission, cities of Mankato and North Mankato, Blue Earth, Nicollet and Le Sueur counties and Minnesota State University, Mankato. The partnership was created to provide a forum to discuss and develop long-range regional transportation policies and objectives.

The Mankato Area Transportation and Planning Study (MATAPS), which was first drafted in 1970 and updated in 1996, 2003, 2006, and 2011, fostered a spirit of cooperation and provided a vehicle for dialogue that facilitated the smooth transition of the partners into the Metropolitan Planning Organization (MPO) partnership which was officially designated on January 11, 2013.

Mankato/North Mankato Area Planning Organization (MAPO)

The MAPO is the federally-designated Metropolitan Planning Organization (MPO) for the region's urban/rural area including the cities of Mankato, North Mankato, Eagle Lake, and Skyline; Blue Earth and Nicollet counties; and the townships of Belgrade, Lime, South Bend, LeRay and Mankato. MAPO's 2045 Transportation Plan provides a framework for understanding where major employers are located throughout the MAPO area which provides a good understanding of travel behavior. The labor shed for the Greater Mankato marketplace spans 16 counties with the roadway infrastructure within the region providing far reaching 30, 45, and 60-minute commutes that have a population of more than 381,000 and a labor force of more than 250,000 between ages 15 and 64 (2010 US Census, Greater Mankato Growth).

The Greater Mankato Growth, the MAPO area's Chamber of Commerce and Economic Development Agency assembled commuter data based on the 2010 US Census information for a selection area defined as the Mankato-North Mankato Metropolitan Statistical Area (Blue Earth and Nicollet Counties) and concluded on the following findings:

- There is a net inflow of primary jobs to the MAPO market area, meaning there are more jobs in this market than people living within the market area. A primary job generally consists of high paying jobs and longer-lasting careers that include a retirement and benefits package and require some sort of formal education.
- Almost 72 percent of the labor force living in the market area also works here. However, 28 percent of the labor force live in the market area but commute to work outside the area.
- The majority (57 percent) of the labor force that live in the market area commute less than 10 miles to work.
- 60 percent of those employed in the market area also live in the market area; 40 percent are employed here but live outside the market area.
- Almost 50 percent of those employed in the market area travel less than 10 miles to work; approximately 22 percent travel greater than 50 miles.
- The Mankato/North Mankato Area Planning Organization (MAPO) and the Minnesota Department of Transportation (MnDOT) are conducting the Highway 22 Corridor Study from St. Peter to Mapleton. The Study will evaluate existing and future transportation recommendations, including: lane configurations, access management, intersection control options, alternative intersection designs, bicycle and pedestrian connectivity, local roadway and trail networks, and potential land use impacts and opportunities.

Freight-Related Industries and Economy

Minnesota is a leader in several freight-related industries. Agriculture, mining, and manufacturing form the core of these freight related industries. Freight volumes by tonnage are projected to double in Minnesota, from 664 million tons in 2002, to 1,329 million tons in 2035. If current agricultural trends continue, freight traffic in Southwest Minnesota, including the MATAPS Study Area, could see significant growth including a potential 200 percent increase by 2030 (approximately double the statewide rate). The following key roadways are significant freight corridors within the MATAPS Study Area due to their importance to the region's and State's economy:

- MN 60 from Iowa to Mankato (for ethanol plants and shuttle elevators);
- US 14 from South Dakota to I-35 and US 169 from Mankato to the Twin Cities (for grain, port access); and I-90 through the region (for national connections).

Specifically, US 169 is the primary transportation corridor for funneling freight into the Twin Cities from Mankato and southern Minnesota. This area produces almost half of Minnesota's corn, soybeans, and ethanol, making Minnesota third in the nation for production among all states. Other major commodities moving along this corridor include aggregates, clay and sand, hogs, manufactured goods and food products.

Due to the consolidation of small farms into fewer but larger farms to achieve transportation economies of scale, farmers in Minnesota and elsewhere, are shipping more outputs over longer distances compared to the previous pattern where farmers would focus on short moves to local consolidation points and rail terminals. At the same time, Class I railroads are trending more towards unit trains. This is leading agriculture towards larger, 100-plus car, grain shuttle and consolidation facilities, which involve longer shipments via truck to deliver products to these facilities.

Chapter 9 – Goals, Objectives and Implementation Strategies

A Land Use Plan provides a vision and broad-based guidance – in other words, a foundation – upon which County officials, staff and residents will base many decisions in the years to come. The plan's goals and objectives are the primary tools for providing direction for future land use decisions. This plan allows County officials to operate in an even-handed manner, treating all development proposals with the consistent and uniform application of adopted regulations. This plan provides a basis for approving developments and updating code in a manner that is consistent with the County's vision, goals, and objectives. The Land Use Plan promotes long-term, orderly and sustainable development in the applicable zoning districts.

In the following pages, goals and objectives are provided for seven categories. Under each category, a **goal** is stated and related objectives that will lead to the accomplishment of the goal are provided. In total, the goals and objectives support the Land Use Plan Vision Statement. A goal is a statement specific to the County system that sets the stage for decision making. An **objective** guides future actions and decision-making efforts. Specific **implementation** actions to achieve the goals and objectives of this chapter have been included. A general timeline and lead agency/department are identified for each action.

Land Use Plan Vision: Blue Earth County will continue to provide a high quality of life for its residents, from agricultural production to urban living. A focus on agricultural preservation, natural resource protection, recreational opportunities, and well-planned growth throughout the county will preserve and secure diverse quality-of-life options for residents.

Agricultural Goal and Objectives:

Agricultural Goal:

Blue Earth County will maintain its agricultural areas by limiting new development to reduce conflicts between farm and non-farm uses and by adopting performance standards for certain agricultural uses to better protect its natural resources.

Agricultural Objectives:

1. Preserve agricultural land for future agricultural use by limiting conversion to non-agricultural uses.
2. Support the agricultural economy in Blue Earth County. This includes farming operations of all scales and those industries which directly support agriculture.
3. Adapt to changes in agricultural trends to ensure that policies and regulations support continued agricultural production.
4. Encourage agricultural practices that support environmental conservation and protection.

Agricultural Implementation Actions	Timeframe	Responsibility
1. The County will continue to enforce its dwelling density performance standard of one (1) dwelling unit per quarter-quarter section in the Agricultural Zoned District.	On-going	Environmental Services Staff, Planning Commission and County Board
2. The Transfer of Residential Development Rights (TDRs) within the Agricultural and Conservation Districts will continue to be allowed. However, the sender must either own the entire quarter-quarter out of which the dwelling unit allowance will be transferred or all property owners in the sending quarter-quarter with buildable areas must agree. The receiving quarter-quarter must share a common boundary or corner with the sending quarter-quarter. In addition, both the sending and receiving quarter-quarter must have an area which meets the current standards for being buildable as established by the Ordinances. The maximum dwelling unit allowance per quarter-quarter in the agricultural district is four (4). Monitor this regulation and its effectiveness as development trends change.	On-going	Environmental Services Staff, Planning Commission and County Board
3. The County will review the Zoning Ordinance provisions for all permitted and conditional uses in its Agricultural District. The review will ensure compatibility with agricultural uses. The review shall eliminate non-compatible uses and where applicable, new uses shall be added.	Short-term	Environmental Services Staff, Planning Commission and County Board

Agricultural Implementation Actions	Timeframe	Responsibility
4. Review the development regulations and performance standards that apply to the Agricultural District.	Short-term	Environmental Services Staff, Planning Commission and County Board
5. Add performance standards related to the management of stormwater for those items that require a Conditional Use Permit (CUP).	Short-term	Environmental Services Staff, Planning Commission and County Board
6. Setback standards will be reviewed for feedlots from any Residential District and any County park boundary.	Short-term	Environmental Services Staff, Planning Commission and County Board
7. Review the feedlot ordinance for possible amendments to reduce the minimum lot size requirements.	Short-term	Environmental Services Staff, Planning Commission and County Board
8. Encourage the use of agricultural Best Management Practices (BMPs) to protect and enhance sensitive environmental features.	On-going	Environmental Services Staff

Natural Resources Goal and Objectives:

Natural Resources Goal:

Protect, enhance and restore aquatic and natural resources for current and the future generations, and protect the quantity and quality of groundwater resources to ensure long term sustainability of groundwater supplies.

Natural Resources Objectives:

1. Protect, enhance and restore wetlands to provide one or more functions, such as water quality, stormwater attenuation, flood water storage, fish and wildlife habitat, groundwater recharge, recreation, shoreline protection, etc.
2. Minimize fragmentation and development of woodlands, wildlife habitat, open space, shoreland and wetlands in river corridors, lake watersheds, wetland complexes, and Greenprint priority areas. (Reference: Minnesota Statutes 2017, sections 394.23, 394.231 and 462.357 Subd.9)
3. Stormwater and stormwater runoff should be managed to prevent or minimize flooding, pollution, erosion and sedimentation in downstream receiving waters, drainage areas or property.
4. Land development projects in shoreland and Greenprint areas should protect soils, wildlife habitat, water quality, natural vegetation and wetlands.
5. Encourage preservation of the scenic and recreational value of natural areas, lakes, wetlands, river corridors, parks and trails.
6. Wastewater should be managed to protect surface and groundwater resources and public health.
7. Support goals, strategies and actions in the Blue Earth County Water Management Plan and other natural resource and water management plans
8. Land use planning and management have an important role in protecting groundwater resources. Land development projects and proposals should minimize potential for groundwater contamination.
9. Mining or otherwise extracting natural resources and their accessory uses should be designed, managed and reclaimed to protect surface and ground water resources, air quality and public safety with consideration of the general character of land uses in the area in both pre- and post-mining stages.

Natural Resources Implementation Actions	Timeframe	Responsibility
Coordination with other plans		
1. Support land use management and policies to protect aquatic and natural resources in development and coordination of land use plans, comprehensive plans, transportation plans, stormwater plans, water management plans, hazard mitigation plans, and park and open space plans from all local government jurisdictions to protect aquatic and natural resources.	On-going	Environmental Services

Natural Resources Implementation Actions	Timeframe	Responsibility
2. Support goals, strategies and actions in the Blue Earth County Water Management Plan.	On-going	Environmental Services
3. Utilize and update the Blue Earth County Greenprint to protect, enhance and restore natural resources and support development of green infrastructure throughout the county.	On-going	Environmental Services
Surface Water Actions		
1. Establish and maintain vegetation in riparian areas and riparian buffers in accordance with Minnesota Statutes 2017, sections 103F.401 to 103F.445 and the Blue Earth County Shoreland Ordinance.	On-going	Environmental Services, SWCD
2. Continue to administer the Blue Earth County Feedlot program to reduce the potential for pollution of surface water and groundwater from feedlots and manure management.	On-going	Environmental Services
Wetlands Actions		
1. Continue to review development projects to determine if wetlands may be present and require wetland boundary delineations when needed.	On-going	Environmental Services
2. Continue to ensure wetland functions are protected with protection a minimum of 16.5 feet from wetlands when new subdivisions are platted.	On-going	Environmental Services
3. Consider wetland setbacks to prevent encroachment, erosion, and sedimentation from surrounding uplands and drainage areas to protect wetlands from accelerated sedimentation and loss of water storage, loss of habitat or encroachment from surrounding land uses. Revise ordinances and policies if needed.	Long-term	Environmental Services
4. Consider amending land use policies and official controls requiring dedication of parkland to allow open space dedication, including wetlands, for public use in Greenprint priority areas as allowed by Minnesota Statutes. (Reference: Minnesota Statutes 2017, sections 394.25 Subd.7 and 462.358 Subd. 2b)	Long-term	Environmental Services
Stormwater Actions		
1. Continue to require and review stormwater management and construction site runoff and erosion control plans to reduce runoff, erosion and sedimentation.	On-going	Environmental Services
2. Review stormwater management and land use ordinances and policies to determine how stormwater management and erosion control requirements can be improved to protect downstream receiving waters and property from erosion, flooding and potential pollutant run-off. Make revisions as needed.	Long-term	Environmental Services

Natural Resources Implementation Actions	Timeframe	Responsibility
3. Support contractor training and homeowner education to comply with State and County erosion control and stormwater management requirements and encourage stormwater best management practices to protect water quality.	Long-term	Environmental Services
Shoreland Actions		
1. Continue to administer the Shoreland Ordinance.	On-going	Environmental Services
2. Review the Shoreland Ordinance and policies to determine if revisions are needed to better protect public water lakes, rivers, streams and wetlands. Make revisions as needed.	Long-term	Environmental Services, MNDNR
3. Protect and encourage the enhancement and restoration of natural and aquatic vegetation and wetlands in near-shore areas to provide critical fish and wildlife habitat and shoreline protection from stormwater runoff, waves and ice ridges.	On-going	Environmental Services
Groundwater Actions		
1. Continue to ensure wells are properly sited, constructed and sealed in accordance with the Minnesota Well Code and the Minnesota Department of Health delegation agreement.	On-going	Environmental Services
2. Continue to ensure subsurface sewage treatment systems (SSTS) are in compliance with Blue Earth County Code and Minnesota Rules.	On-going	Environmental Services
3. Continue to review and include conditions for development proposals to address storage, use and disposal of potentially hazardous substances and hazardous waste to prevent potential surface and groundwater contamination from runoff or leaching through soils and bedrock.	On-going	Environmental Services
4. Utilize the Geologic Atlas of Blue Earth County, Part B, and the Blue Earth County Water Management Plan to review land use and development projects to protect groundwater in areas with moderate or high pollution sensitivity.	On-going	Environmental Services
5. Protect and encourage restoration of wetlands in river corridors and former sand, gravel and rock mining sites to protect groundwater and provide wildlife habitat or recreation.	On-going	Environmental Services
Mining Actions		
1. Review ordinances, polices and requirements for mining plans and reclamation plans to ensure pre-mining conditions, surface and ground water protection, mining methods, auxiliary facilities, traffic, public safety, site management, staging operations, vegetation management, dust, noise, odors, lighting, wildlife habitat, scenic views and other concerns are addressed.	Short-term	Environmental Services

Natural Resources Implementation Actions	Timeframe	Responsibility
2. Review and consider amending regulations for mining performance bonds.	Short-term	Environmental Services
3. Consider development of a master plan for mining reclamation using the Greenprint Master Plan for Mining Reclamation Framework.	Short-term	Environmental Services

Community Resilience Goal and Objectives:

Community Resilience Goal:

Maintain community resilience with sustainable lifeline systems to ensure potable water, wastewater treatment, and stormwater management systems to protect public health, public safety, and property.

Community Resilience Objectives:

1. Prevent losses from flood hazards through implementation of the National Flood Insurance Program.
2. Ensure community resilience with stormwater management systems, better site design and other projects that effectively provide flood water and stormwater attenuation to prevent flooding, erosion and protect water quality.
3. Minimize ravine, stream bank and bluff erosion, construction site runoff, farmland tile, erosion hazards, and mitigation costs throughout the County.
4. Protect and enhance natural flood water and stormwater storage and treatment systems in floodplains, wetlands and shoreland areas.
5. Ensure water wells are properly located, constructed and maintained.
6. Ensure land development proposals address storage, use and disposal of potentially hazardous substances and hazardous waste.
7. Support long term, sustainable wastewater treatment systems to protect groundwater and surface water from contamination from sewage and hazardous substances.
8. Work to eliminate discharge of untreated and undertreated wastewater to surface water and groundwater.
9. Support goals, strategies and actions in the Blue Earth County Hazard Mitigation Plan, Blue Earth County Water Management Plan, stormwater plans and watershed plans.

Community Resilience Implementation Actions	Timeframe	Responsibility
1. Participate in updating the Blue Earth County Hazard Mitigation Plan to address potential hazards and identify mitigation actions for floods, near-channel erosion, water supply contamination, and hazardous materials release, for example.	Short-term and On-going	Emergency Management, Environmental Services, Public Works
Flooding Actions		
1. Adopt the preliminary FEMA Flood Insurance Rate Maps when they are approved by FEMA and revise floodplain ordinances to conform to FEMA/MNDNR standards.	Short-term	Environmental Services

2. Revise floodplain ordinances to prohibit filling or new dwellings in the General Floodplain and Flood Fringe District and to conform to the County Zoning Ordinance which requires lots to have the required buildable area outside of floodplains.	Short-term	Environmental Services
3. Consider land use controls to prevent land development in the Rapidan Dam flood inundation area.	Short-term	Environmental Services, Public Works, Emergency Management
4. Review ordinances and policies to ensure water storage potential of natural systems are considered and protected in wetlands, floodplains, and vegetation that protect soils and increase evapotranspiration.	Short-term	Environmental Services
Erosion and Erosion Hazards Actions		
1. The County will review and consider increasing structure and other setbacks in areas with potential riverine and near-channel erosion hazards in incised reaches of rivers and streams and steep slopes to prevent future erosion hazards and reduce hazard mitigation costs. (Hazard Mitigation Plan)	Short-term	Environmental Services, Other affected Townships, Emergency Management, Public Works
2. The County will consider requiring site-specific assessment of vulnerability prior to land development and alterations in areas with eroding bluffs and steep slopes.	Short-term	Environmental Services, Affected Townships, Emergency Management, Public Works
3. Review and revise stormwater management and land use ordinances and stormwater management policies to decrease surface water runoff and subsurface drainage discharges directed to streambanks, bluffs, ravines and steep slopes to reduce erosion.	Short-term	Environmental Services, Affected Townships, Public Works
Stormwater Management Actions		
1. Continue to require site owners/contractors obtain required MPCA NPDES construction stormwater permits.	On-going	Environmental Services
2. Continue to implement and develop ordinances, policies and documents necessary to support the MS4 program as required by the State.	On-going	Environmental Services, County Attorney

3. Work with other jurisdictions to evaluate the effectiveness of existing and potential stormwater ordinances and determine if a uniform approach is desired to develop or administer local stormwater regulations and amend ordinances as needed.	Long-term	Environmental Services, Interested Municipalities, Public Works
4. Support increasing water storage by enhancing and restoring wetlands and developing green infrastructure to increase water storage and provide other benefits.	On-going	Environmental Services
5. Protect wetlands from development impacts during construction with vegetated buffers, perimeter controls and other erosion control strategies to ensure wetland storage volume is not diminished due to accelerated erosion and sedimentation. (Reference: MPCA NPDES Construction General Permit)	On-going	Environmental Services
Wastewater Actions		
1. Continue to ensure subsurface sewage treatment systems (SSTS) are in compliance with Blue Earth County Code and Minnesota Rules.	On-going	Environmental Services
2. Continue to require sufficient lot area for subsurface sewage treatment systems and replacement systems.	On-going	Environmental Services
3. Continue to support growth and development in municipalities or areas with publicly owned collection and treatment systems to ensure that wastewater treatment needs are met for the future and to help reduce long-term costs associated with growth to the taxpayers.	On-going	Environmental Services
4. Continue to support orderly annexation agreements.	On-going	Environmental Services
Water Supply Actions		
1. Continue administering the Minnesota Well Code, issue permits, inspect the construction of new domestic wells and non-community water supply wells, inspect the sealing of abandoned well, and ensure wells are maintained in accordance with the Minnesota Department of Health delegation agreement.	On-going	Environmental Services
2. Continue to review land development proposals to ensure required well isolation distances (setbacks) from existing and future wells will be maintained and abandoned wells are identified and properly sealed.	On-going	Environmental Services
3. Continue to coordinate water appropriations permitting with MNDNR.	On-going	Environmental Services

Land Use Goal and Objectives

Land Use Goal:

The County will support the utilization of its land and related natural resources, so they are conserved for future generations. In addition, the County will continue to support the growth of all municipalities while preserving agriculture, rural character, and its scenic value.

Land Use Objectives:

1. Maintain ordinances that appropriately respond to the residential, agricultural, industrial and commercial trends of Blue Earth County.
2. Maintain relationships with cities and townships to ensure adequate area exists to support future demand for residential, agricultural, commercial, and industrial uses.
3. Refer to other system plans (e.g., Water Management Plan, MAPO Transportation Plan, Hazard Mitigation Plan, and other relevant plans) when making future decisions on growth and development or updating the Land Use Plan.
4. Preserve the health, safety, and welfare of all residents and the environment in Blue Earth County.

Land Use Implementation Actions	Timeframe	Responsibility
1. The County will assess all permitted and conditional uses in all zoning districts. When necessary, amendments to the Ordinance shall be made.	Short-term	Environmental Services, Planning Commission and County Board
2. The County will assess the district standards (height, yard and lot area, width and depth regulations) for all zoning districts.	Short-term	Environmental Services and Planning Commission
3. The County will consider amending its definition of "Lot of Record" in the Agricultural District to be February 1, 1985.	Short-term	Environmental Services, Planning Commission and County Board
4. The County will amend its Individual Sewage Treatment System ordinance as needed.	Short-term	Environmental Services, Planning Commission and County Board
5. The development of future commercial uses in the rural area shall be reviewed for their emergency services, stormwater and wastewater treatment, access to transportation systems, and water supply needs and the corresponding impacts to those systems.	On-going	Environmental Services, Planning Commission and County Board
6. Regularly review the Land Use Plan and pursue amendments on a regular basis to ensure the plan appropriately guides decision making.	On-going	Environmental Services, Planning Commission and County Board

Land Use Implementation Actions	Timeframe	Responsibility
7. Continue to enforce ordinances related to junkyards and solid waste.	On-going	Environmental Services
8. The County will review the urban fringe overlay districts. The district's boundaries around the City of Mankato, the City of Eagle Lake, and the City of Madison Lake could be amended following consultation with the city's representative(s) and a public input process. Each city's growth needs, and future utility service areas will be considered. Future Growth boundaries around the other municipalities shall be a coordinated effort between the County and its municipalities. Future amendments will include review from MnDOT, MAPO, Townships, and other primary stakeholders as deemed appropriate.	Long-term	Environmental Services, Planning Commission, County Board and applicable cites.
9. Continue to integrate and actively participate in land use and transportation planning activities with other regional agencies (MnDOT, MAPO, etc.).	On-going	County Engineer and Environmental Services

Development Goal and Objectives

Development Goal:

The County will support orderly growth and limit the development of uses that may eventually require the extension of urban utilities outside of municipal areas

Development Objectives:

1. Consider development that can be constructed with minimal impact to existing natural and built systems (e.g., wetlands and transportation).
2. Utilize the Land Use Plan to guide future development in Blue Earth County.
3. Direct new and infill commercial and industrial development to urban areas where access to transportation, water, wastewater and stormwater systems can be provided.
4. Allow for development that adapts to the natural environment and is constructed in a manner that does not negatively impact existing natural resources.
5. Future growth and development in the urban fringe districts near Mankato, Eagle Lake, and Madison Lake should be steered to the municipalities and be consistent with orderly annexation agreements, land use plans of the affected jurisdictions, MAPO transportation plans, MATAPS, and other local and regional transportation plans, protection of natural resources, the County Greenprint, County Land Use Plan, and other local and regional plans.
6. Consider the development of alternative energy projects that avoid negative impacts to any nearby environmentally sensitive areas.

Development Implementation Actions	Timeframe	Responsibility
1. The County will support the establishment of annexation agreements between its municipalities and their surrounding townships for the purpose of encouraging urban development to occur in urban areas with urban services.	On-going	Environmental Services, Planning Commission and County Board
2. The County will adopt performance standards for development that has higher than average impacts upon existing infrastructure.	Short-term	Environmental Services, Planning Commission and County Board
3. Regularly review and amend the zoning ordinance and land division regulations to ensure standards correlate with current development trends.	On-going	Environmental Services, Planning Commission and County Board
4. Review allowed uses in all zoning districts to encourage small business growth throughout the County.	Short-Term	Environmental Services, Planning Commission and County Board
5. Review lot size and setback requirements and identify amendments that promote the goals and objectives of this plan.	Short-Term	Environmental Services

Development Implementation Actions	Timeframe	Responsibility
6. Review and possibly amend the parking standards in residential districts to meet current needs.	Long-Term	Environmental Services, Planning Commission, County Board
7. Review the current standards for home occupations and identify amendments that promote the goals and objectives of this plan.	Short-Term	Environmental Services, Planning Commission, County Board
8. Review solar and wind energy ordinances and identify amendments that promote the goals and objectives of this plan.	Short-Term	Environmental Services
9. Review the regulations for when a construction permit is required.	Short-Term	Environmental Services, Planning Commission and County Board
10. Review the regulations for when a demolition permit is required.	Short-Term	Environmental Services, Planning Commission and County Board

Housing Goal and Objectives

Housing Goal:

The County will encourage multi-unit housing development to be in areas that can be serviced by city utilities. Housing developments in rural areas, shall have adequate separation between residential and non-residential uses.

Housing Objectives:

1. Allow for the development of a diverse housing stock (single-family, two-family, and multiple-family dwellings), as allowed by the applicable zoning districts.
2. Consider the development of cluster housing developments with shared systems that reduce impacts to service costs and the natural environment, provided the necessary standards are met for stormwater, wastewater, and transportation needs.
3. Preserve and enhance the existing character of neighborhoods and urban areas by encouraging similar uses and developments.

Housing Implementation Actions	Timeframe	Responsibility
1. Research possible performance standards for the creation of Conservation Subdivisions as a Conditional Use Permit in the Ag or Conservation Districts.	Long-term	Environmental Services, Planning Commission, County Board
2. Support housing development that provides for the best use of land and services (i.e., shared access and community infrastructure systems).	On-going	Environmental Services
3. Review the performance standards for the Elder Care provision of the Zoning Ordinance.	Long-term	Environmental Services, Planning Commission, County Board

Transportation Goal and Objectives

Transportation Goal:

Land use proposals as they relate to road construction, access points, and service road requirements will be tied to the County's transportation planning efforts and will be reviewed by the applicable road authority.

Transportation Objectives:

1. Maintain a transportation system that allows for the safe and efficient movement of people and goods through Blue Earth County and responds to growth.
2. Consider multiple modes of transportation when reviewing developments and undergoing long-range planning efforts.
3. Maintain relationships with MnDOT, MAPO, cities, townships and other agencies to provide a connected network throughout the County.
4. Identify transportation impacts of rural development.
5. Future development shall meet the County standards for land use and access management.

Transportation Implementation Actions	Timeframe	Responsibility
1. County Environmental Services staff will work with the County Engineer to develop criteria for future proposals which limits the number of new access points along all county roads.	On-going	Environmental Services, County Engineer and Planning Commission
2. For development proposals located along minor arterials or greater, service roads may be required to be built to service the proposed use.	On-going	Environmental Services, applicable road authority, Planning Commission and County Board
3. Establish a maximum grade requirement that will apply to the construction of all new private access roads.	Short-term	Environmental Services and County Engineer
4. The County needs to assess its policy regarding the number of field approaches that are permitted along different classes of roads. Some determination needs to be made regarding the standard that should be applied to this type of access point and the appropriate ordinances should be amended.	Short-term	Environmental Services, County Engineer and Planning Commission
5. Review the standards for the permitting of advertising structures.	Long-term	Environmental Services, area road authorities, Planning Commission, and County Board
6. Continue to integrate and actively participate in land use and transportation planning activities with other regional agencies (MnDOT, MAPO, etc.).	On-going	County Engineer and Environmental Services

Transportation Implementation Actions	Timeframe	Responsibility
7. While reviewing proposed development projects, consider maintaining existing zoning classifications to help preserve land for potential ROW until funding becomes available for future roadway construction.	On-going	County Engineer and Environmental Services
8. While reviewing proposed subdivision plats, consider requiring ROW dedication as a part of the platting process in order to ensure the plat configuration conforms to the long-term transportation plans.	On-going	County Engineer and Environmental Services

[THIS PAGE WAS INTENTIONALLY LEFT BLANK]